

FINANCIAL STABILITY REPORT 37

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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Editorial close: June 6, 2019

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

Call for applications: Klaus Liebscher Economic Research Scholarship

The Oesterreichische Nationalbank (OeNB) invites applications for the “Klaus Liebscher Economic Research Scholarship.” This scholarship program gives outstanding researchers the opportunity to contribute their expertise to the research activities of the OeNB’s Economic Analysis and Research Department. This contribution will take the form of remunerated consultancy services.

The scholarship program targets Austrian and international experts with a proven research record in economics and finance, and postdoctoral research experience. Applicants need to be in active employment and should be interested in broadening their research experience and expanding their personal research networks. Given the OeNB’s strategic research focus on Central, Eastern and Southeastern Europe, the analysis of economic developments in this region will be a key field of research in this context.

The OeNB offers a stimulating and professional research environment in close proximity to the policymaking process. The selected scholarship recipients will be expected to collaborate with the OeNB’s research staff on a prespecified topic and are invited to participate actively in the department’s internal seminars and other research activities. Their research output may be published in one of the department’s publication outlets or as an OeNB Working Paper. As a rule, the consultancy services under the scholarship will be provided over a period of two to three months. As far as possible, an adequate accommodation for the stay in Vienna will be provided.

Applicants must provide the following documents and information:

- a letter of motivation, including an indication of the time period envisaged for the consultancy
- a detailed consultancy proposal
- a description of current research topics and activities
- an academic curriculum vitae
- an up-to-date list of publications (or an extract therefrom)
- the names of two references that the OeNB may contact to obtain further information about the applicant
- evidence of basic income during the term of the scholarship (employment contract with the applicant’s home institution)
- written confirmation by the home institution that the provision of consultancy services by the applicant is not in violation of the applicant’s employment contract with the home institution

Please e-mail applications to scholarship@oenb.at by October 1, 2019.

Applicants will be notified of the jury’s decision by mid-November. The following round of applications will close on October 1, 2020.

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, the Financial Stability and Macroprudential Supervision Division, the European Affairs and International Financial Organizations Division, the Supervision Policy, Regulation and Strategy Division and the Off-Site Supervision Division – Less Significant Institutions, with contributions from Andreas Breitenfellner, Judith Eidenberger, Eleonora Endlich, Robert Ferstl, Andreas Greiner, Manuel Gruber, Bernhard Kallinger, Stefan Kavan, David Liebeg, Benjamin Neudorfer, Christian Ragacs, Elisa Reinhold, Benedict Schimka, Martin Schneider, Josef Schreiner, Reinhard Seliger, Michael Sigmund, Peter Strobl, Eva Ubl, Walter Waschiczek and Tina Wittenberger.

Management summary

International macroeconomic environment: global and European growth slows down somewhat as downside risks prevail

Global growth has been weakening since the second half of 2018, leading to downward revisions in current forecasts. The revised outlook suggests a delay in the return of euro area inflation to its target rate. Hence, the ECB is expanding its accommodative monetary policy stance, while international stock indices have been volatile amid global trade tensions and geopolitical downside risks.

Favorable macroeconomic conditions supported banking sector activity in most countries of Central, Eastern and Southeastern Europe (CESEE) in 2018. Growth was especially strong in the CESEE EU Member States, benefiting from booming labor markets and strong investment demand. Robust GDP growth went hand in hand with a further acceleration of credit growth amid low interest rates and ample liquidity. This contributed to a further reduction of nonperforming loans (NPLs) and an increase in banking sector profitability. Economic growth and banking sector results were also solid outside the EU, for instance in Russia and Ukraine. Only Turkey suffered from economic turbulences sending the economy into recession in the second half of 2018, which weighed on credit growth, loan quality and banking sector profitability.

Corporate and household sectors in Austria: income growth supports debt service capacity

The Austrian economy continued to grow in 2018. Despite a slowdown in the second half of 2018 and early 2019, growth still supported the earnings-generating capacity of Austrian nonfinancial corporations. Consequently, companies' internal financing, which constitutes the most important source of funds, remained at a high level in 2018, whereas the use of external financing sources more than halved. Given the low interest rate environment, debt instruments once again were the most important source of external financing in 2018. Lending by Austrian banks to nonfinancial corporations gained further momentum, substituting for other debt instruments, such as intra-company loans, loans from foreign banks and corporate bonds, which all contracted in 2018. In early 2019, the annual growth rate of corporate loans by Austrian banks reached more than 7%, the highest value in more than a decade. Lending to the corporate sector was strongly driven by lending for real estate activities. Likewise, the main contribution to the growth of bank lending to households – which increased slightly in recent months – came from housing loans; they remained the most important category of loans to households and grew at a slightly faster pace.

Overall, companies' and households' debt levels rose moderately in 2018, but remained below euro area averages when measured against income. Moreover, debt sustainability benefited from increased profits and income resulting from favorable economic conditions. In addition, the low interest rate environment has been supporting current debt servicing capacities, which has been reinforced by the still high share of variable rate loans. So while companies and households presently have lower interest expenses, their exposure to interest rate risk is considerable.

The upward trend of residential property prices in Austria persisted in 2018 and early 2019. Reflecting this price growth, residential property prices continued to deviate from fundamentally justified values, according to the OeNB's relevant indicator.

Austrian financial intermediaries: bank profits reach another post-crisis high, while insurance sector results are under pressure

Austrian banks continued to benefit from macroeconomic tailwinds in 2018, with consolidated profits reaching another post-crisis high. This trend was driven by rising income on the one hand and historically low risk provisioning on the other. However, cost efficiency remained weak. The reduction of nonperforming loans together with an acceleration in credit growth led to further improving credit quality indicators both in Austria and in CESEE. At the same time, Austrian banks' capital ratios declined due to a rise in risk-weighted assets and a doubling of the dividend payout ratio. Yet, high liquidity coverage ratios attest to domestic banks' solid short-term resilience against liquidity shocks, as funding is mostly based on retail and corporate deposits.

Since the establishment of the Financial Market Stability Board (FMSB) five years ago, macroprudential measures have crucially contributed to strengthening the resilience of the Austrian banking sector, reduced the probability of public bank bailouts and positively influenced the external assessment of Austrian banks. In 2018, Standard & Poor's ranked the domestic banking sector among the most stable in the world. That said, close supervisory monitoring remains necessary in particular in mortgage lending, as interest rates for housing loans have continued to decline, mortgage growth has remained strong and prices for real estate have been increasing further. Furthermore, banks have been issuing a nonnegligible share of new mortgage loans without adequate deposit payments, and debt service in relation to borrowers' incomes has been rising. Against this backdrop, the FMSB has issued quantitative guidance related to sustainable mortgage lending standards, whose effectiveness the OeNB is currently evaluating.

Thanks to supervisory measures, foreign currency loans have continued their sharp decline and, at present, do not represent a systemic risk to the Austrian banking system in general. Nevertheless, the risks to individual borrowers may still be high. For this reason, the OeNB, in cooperation with the FMA and the Austrian Economic Chambers, issued a new information leaflet earlier this year in order to further increase borrowers' awareness of the risks inherent in these loans, especially when they are linked with a repayment vehicle.

Persistently low yields have remained a challenge for the insurance sector, especially for life insurers, and the profitability of the whole sector has deteriorated. However, the solvency capital ratio of Austrian insurance companies is at a comfortable level that corresponds to the European average.

Recommendations by the OeNB

In the current phase of slowing economic activity, Austrian banks should focus on tackling persistent challenges in order to foster the sustainability of their profits, improve their resilience, and ensure that they have enough room for maneuver in the future. Against this background, the OeNB recommends that banks take the following measures:

- Use the window of opportunity provided by cyclically-induced low risk costs to further improve structural efficiency. This would help safeguard banks' profitability.
- Reinvigorate efforts to further improve capitalization, especially at significant institutions, as strong credit growth may pave the way for the emergence of future credit risks.

- Apply sustainable lending standards in real estate lending, both in Austria and in CESEE, and comply with the quantitative guidance issued by the Financial Market Stability Board.
- Develop and apply adequate strategies to deal with challenges linked to new information technologies and digitalization (e.g. fintech competitors, update of existing IT systems).
- Continue with efforts to resolve NPLs in CESEE and comply with the aforementioned sustainable lending standards to prevent the buildup of NPLs.
- Continue to comply with the supervisory minimum standards for foreign currency and repayment vehicle loans as well as the Sustainability Package.

International macroeconomic environment: global and European growth slows down somewhat as downside risks prevail

Uncertainties weigh on global growth

Global growth has been weakening, leading to downward revisions of current forecasts. In the second half of 2018, global economic growth softened noticeably due to a significant downturn in global trade, which was attributable, among other things, to the intensifying trade conflict between the U.S.A. and China. In addition, China introduced stricter rules for the shadow banking system in 2018, which had a depressing effect on import demand. In the euro area, momentum weakened especially because of problems in the German car industry in connection with the introduction of new emission standards. Against this backdrop, the current IMF forecast (published in April) predicted world economic growth to reach 3.3% in 2019 and 3.6% in 2020. Compared with the October 2018 forecast, this represents a downward revision of 0.4 percentage points for 2019. The slowdown mainly affects the manufacturing sector and countries whose exports of industrial goods contribute strongly to GDP growth. At the same time, services growth has continued to be robust, supporting both employment and consumption. Financial conditions have remained more restrictive than in the fall of 2018 due to the trade tensions' impact on business confidence. Nevertheless, there was some easing in 2019 due to a more accommodative monetary policy in key advanced economies and cautious optimism about a forthcoming U.S.-Chinese trade deal. Inflation pressures remained subdued thanks to lower commodity and energy prices.

The IMF has identified various factors that may dampen economic growth. The IMF stresses that globally, downside risks are prevailing. For instance, a resurgence of trade disputes and related political uncertainty could again dampen economic growth. Global financial markets remain vulnerable to investors' dwindling risk appetite and a renewed flight to safe assets. A crisis of confidence could be triggered, for example, by a hard Brexit or a prolonged period of heightened yields on Italian government bonds as well as contagion effects on the euro area.

Concerns over global financial stability have remained elevated in several systemic countries. The most recent IMF's Global Financial Stability Report distinguishes between financial vulnerabilities and possible crisis triggers. In particular, the IMF identifies the following vulnerabilities: increased corporate debt in advanced economies, China's financial imbalances, volatile portfolio flows to emerging markets and unsustainably high house prices in many countries. Spiking risk aversion might be triggered by a further growth slowdown, a less dovish monetary policy outlook or geopolitical tensions. Similarly, the ECB's recently published Financial Stability Review finds that the financial stability environment in the euro area has become more challenging since the end of 2018. Apart from downside risks to economic growth, the report warns against a renewed search for yields and low return on equity for banks. Meanwhile, remaining risks are seen in a sudden correction in risk premiums, corporate and sovereign debt concerns, weak bank profitability and increased risk-taking in nonbanking finance.

Growth is expected to weaken in the U.S.A. The IMF has significantly revised downward its 2019 growth forecast for the U.S.A. The phasing out of fiscal stimulus and the impact of the government shutdown is expected to depress growth to 2.3% in 2019. For 2020, the IMF has revised its outlook up to 1.9% because of a somewhat more expansionary monetary policy stance. Despite the downward revision of the 2019 growth outlook, real GDP expansion will outpace potential growth. The IMF expects that strong growth in domestic demand will also increase import demand. As a result, the current account deficit is expected to widen somewhat despite restrictive trade policy measures. In spite of a strong labor market, the U.S. Federal Reserve (Fed) indicated in March that it would not raise interest rates in the course of the year, given slowing household spending and investment as well as low inflation. In addition, the Fed has slowed down the pace of reducing its reserves.

In Japan and China, government measures have continued to stimulate growth. In Japan, additional fiscal stimulus, including the planned measures to cushion the VAT increase in the fall of 2019, will contribute to an upward revision of the growth outlook to 1% in 2019 and 0.5% in the following year. Given still very low inflation, the Bank of Japan announced that it would maintain key interest rates at zero until spring 2020 and took further measures of quantitative and qualitative monetary easing. In China, revised assumptions about the trade dispute with the U.S.A. resulted in an upward revision of GDP growth to 6.3% for 2019 and 6.1% for 2020. Government policies, particularly fiscal and monetary measures, continue to support growth. In early 2019, the minimum reserve ratio for commercial banks was lowered further. The funds thus freed up will be used for additional loans to households and businesses, stimulating consumption and investment, but also adding to existing indebtedness risks. Inflation has been hovering between 1.5% and 2% over the past few months.

Brexit-related uncertainties have been weighing on the growth outlook for the U.K., while economic growth in Switzerland is set to pick up. The IMF expects real GDP growth in the U.K. to reach 1.2% in 2019 and 1.4% in 2020, rates that are somewhat lower than in the previous forecast, due to ongoing uncertainty over the country's withdrawal from the EU. Fiscal stimulus measures budgeted for 2019 are supporting domestic demand, limiting the downward revision. The economic outlook depends significantly on a smooth transition to a new trade relations framework between the U.K. and the EU. Despite tight labor markets, inflation is expected to remain slightly below 2%. In May 2019, the Bank of England left the Bank Rate unchanged at 0.75% and lowered its expected rise to just around 1% by the end of its forecast period. In Switzerland, the IMF expects GDP growth to pick up again, after a stagnation in the second half of 2018, to reach around 1.1% and 1.5%, respectively, in 2019 and 2020. Inflation is forecast at below 1% for the same period. The exchange rate of the Swiss franc has declined to around CHF 1.14 against the euro since the beginning of 2019; in trade-weighted terms, however, the value of the Swiss franc is still high. The Swiss National Bank has maintained its expansionary monetary policy with negative key interest rates while signaling its readiness to intervene in foreign exchange markets to avoid overvaluation.

Temporary factors are dampening growth in the euro area. The outlook for the economy in the euro area is weak. At 0.4%, growth in the first

quarter of 2019 was better than expected because of favorable weather conditions and trailing effects. In the third and fourth quarters of 2018, however, the euro area economy grew by only 0.1% and 0.2%, respectively. Looking forward, weaker leading indicators are signaling significant drops in the second quarter. While economic activity has remained strong in Spain, and France's economy has been supported by strong export growth as well as expansive fiscal measures, growth in Germany has been stagnating, and Italy has just emerged from a technical recession.

The ECB has lowered its GDP forecast for 2019 and 2020 by roughly half a percentage point to 1.2% and 1.4%, respectively. The forecasts for the euro area reflect the decline in confidence indicators, which is attributable to domestic and global uncertainties, as well as an earlier than expected weakening of the underlying cyclical momentum. The ECB assessed the euro area fiscal stance to have been broadly neutral in 2018 and expects a loosening from 2019 onward. However, weakening growth may further impact private and public debt sustainability, while the high level of indebtedness in individual Member States can magnify identified vulnerabilities. The risks surrounding the euro area growth outlook remain tilted to the downside, given uncertainties related to geopolitical factors, the threat of protectionism and vulnerabilities in emerging markets.

Inflation in the euro area has been falling recently, and the economic outlook suggests a delay in the return to the target rate. Euro area annual headline HICP inflation was estimated at 1.2% in May 2019, down from 1.7% in April. Core inflation – excluding the volatile items energy, food, alcohol and tobacco – has oscillated around 1% over the last months. The future path of inflation is expected to reflect price pressures from labor costs, which continued to strengthen in the fourth quarter of 2018. The Eurosystem expects inflation to reach 1.3% in 2019 and to pick up afterward, reaching 1.6% in 2021. These muted price pressures are attributable to an oil price-driven decrease in energy inflation and a dampened growth outlook. Financial market-based inflation expectations suggest that the current economic downturn will further delay the return to the price stability target in the euro area.

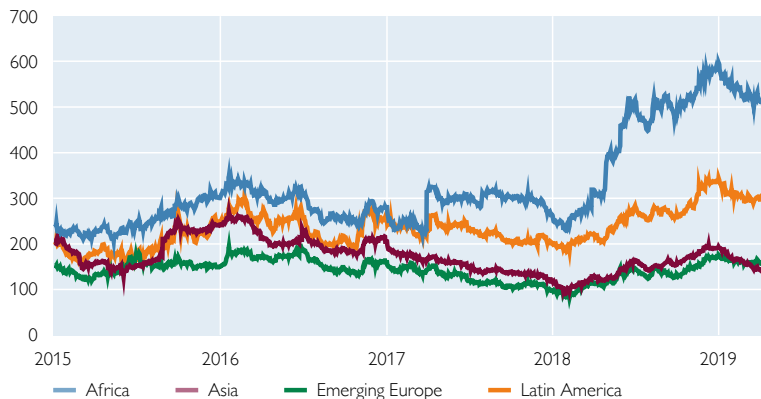
The ECB is expanding its accommodative monetary policy stance. At its June 2019 meeting, the Governing Council of the ECB decided to keep the interest rates on main refinancing operations, the marginal lending facility and the deposit facility unchanged at 0.00%, 0.25% and –0.40%, respectively. The ECB expects its key interest rates to remain at their present levels at least through the first half of 2020. It intends to continue reinvesting, in full, the principal payments from maturing securities purchased under the asset purchase program for an extended period after the start of interest rate normalization. Already in March, the Governing Council decided to launch a new series of quarterly targeted longer-term refinancing operations (TLTRO-III), starting in September 2019 and ending in March 2021, each with a maturity of two years.

The euro has depreciated while stock indices have lost some of their gains seen earlier this year. Since the beginning of 2019, the yields of German ten-year government bonds have declined by almost 50 basis points to –0.3%. Spreads have narrowed further between German benchmark yields and Greek, Portuguese, Spanish and French bonds, while Italian bond spreads contracted less sharply. The spreads between ten-year U.S. Treasuries and German bund yields declined as well. Also since the beginning of the year, the exchange rate of the

Chart 1.1

Spreads of euro-denominated sovereign bonds issued in selected emerging market regions

Euro EMBIG spread in basis points



Source: Macrobond.

Note: EMBIG = Emerging Market Bonds Index Global.

euro in nominal terms has depreciated by some 1.7% to roughly USD/EUR 1.12 and by 3.2% against the Japanese yen. International stock indices have recovered from their drop at the end of 2018. Between January and early June, the representative stock index DJ Euro Stoxx gained around 11%, but saw some losses later in the year. The Dow Jones Industrial Index and the FTSE 100 followed a similar path. Amid intensifying geopolitical tensions, Brent crude oil prices rose by more than 30% in the first months of 2019, to above USD 70 per barrel, but have lost part of their gains since May.

CESEE: favorable economic environment has supported banking sector activity in most countries

Against the backdrop of a softening global economy and weakening world trade, spreads of euro-denominated sovereign bonds increased in all emerging market regions throughout 2018. However, growing optimism about ongoing U.S.-Chinese trade negotiations and major central banks' more patient and flexible approach to monetary policy normalization contributed to a moderation of spreads in the first four months of 2019 (see chart 1.1). Compared to other emerging market regions, CESEE bond markets continued to perform solidly (also taking into account heightened pressure on bond spreads in Turkey against the backdrop of the economic turbulences since mid-2018).

Despite international headwinds, economic activity has remained strong in the CESEE EU Member States. High GDP readings in the first three quarters of 2018 pushed annual average growth to 4.3% in 2018. This represents one of the strongest expansions since 2008. Output growth rested mostly upon domestic demand. Private consumption continued to benefit from benign labor market conditions and swift wage growth that positively impacted on sentiment and prompted consumers to take out credit. Capital formation was fueled by high capacity utilization rates, full order books, EU financing and improved credit market conditions amid low real interest rates and ample liquidity.

However, growth in the CESEE EU Member States seems to have surpassed its cyclical peak. Several pieces of evidence support this assessment: Activity and sentiment indicators were weakening throughout 2018 and partly reached multiannual lows in early 2019. Furthermore, the closely watched purchasing manager indices (PMI) that are available for the Czech Republic and Poland declined to a level of below 50 points (the threshold indicating an expansion) in late 2018 and remained below this threshold also in the first three months of 2019. The last prolonged period of such weak PMI readings dates back to early 2013. This is mirrored in a notable deceleration of GDP growth in the final quarter

of 2018. Recently moderating wage growth rates and softening labor market shortages also suggest weakening economic momentum.

In Russia, growth picked up to 2.3% in 2018, the highest rate since 2012. The stronger momentum can be traced back mainly to a substantial expansion of net exports against the backdrop of higher oil prices and a weaker ruble. The external value of the Russian currency suffered from elevated uncertainty triggered by waves of U.S. sanctions and threats thereof. Growth of domestic demand decelerated owing to stagnating real incomes and a tight fiscal and monetary stance as well as international sanctions taking a toll on foreign investment.

In Ukraine, GDP growth accelerated to 3.3% in 2018. Private consumption grew briskly, benefiting from increasing real wages and pensions as well as from remittances and the growth of loans to households. Growth of gross fixed capital formation decelerated slightly but remained dynamic. Yet, the country's export performance was rather weak, reflecting, among other things, transportation bottlenecks related to the conflict in the Sea of Azov and repairs at several large metallurgical enterprises. Moreover, external price competitiveness suffered from ULC increases. The negative contribution of net exports declined, however, as import growth decelerated notably because of markedly lower gas purchases.

A combination of factors has triggered a marked slowdown in Turkey's economic momentum. Those factors include financial and macro-economic imbalances that have been building up over the past years, deteriorating international relations with the U.S.A. and concerns about the future course of economic policy. Policy tightening to reduce imbalances led to a slump in economic activity in the second half of 2018 and sent the Turkish economy into recession for the first time since the global financial crisis. The decline in GDP was driven by private consumption and investments that suffered from souring sentiment and a sharp reduction of credit growth as financing conditions tightened. Net exports, by contrast, contributed positively to growth against the backdrop of weak domestic demand and a sharp depreciation of the Turkish lira.

Inflation was rather contained in the CESEE EU Member States throughout 2018, despite an economy in full swing. Inflation rates mostly hovered at around 2.5%, with some downward trend toward the end of 2018. The path of inflation was primarily related to volatile energy prices, so that core inflation remained largely stable at around 1.5% on average. Since January 2019, however, inflationary pressures have increased. Both headline and core inflation have been trending up. Core inflation even increased to the highest level since November 2012 and reached an average 2.4% in March 2019. This may reflect domestic price pressures that have been building up over the past two years but have failed to materialize in measured inflation. These price pressures emanated from tight labor markets and strong wage growth pushing up aggregate ULC growth, record high capacity utilization and a positive output gap.

So far, only the Czech National Bank (CNB) and the Romanian National Bank (NBR) have substantially tightened their monetary policy. The CNB raised its policy rate in six steps from 0.5% at the beginning of 2018 to 2.0% in May 2019. The NBR increased its policy rate from 1.75% in early January 2018 to 2.5% in May 2018. In its April 2019 monetary policy meeting, the NBR admitted that inflation had exceeded its expectations in the first two months of 2019 and that inflation would remain above the upper limit of the inflation

target over the short-time horizon. It also stated that it would maintain strict control over money market liquidity.

The Hungarian central bank (MNB) raised its overnight deposit rate to –0.05% in March 2019, while leaving other rates (including the main policy rate) unchanged. It thereby acknowledged the clear upward trend in core inflation and that it had repeatedly missed its inflation target. Furthermore, the MNB reduced the average amount of liquidity to be absorbed by HUF 100 billion to between HUF 300 billion and HUF 500 billion, starting in the second quarter of 2019.

Ukraine was the only CESEE country that reported a clear decline of price pressures in the review period. After a temporary spike toward the end of 2018, inflation resumed its downward trend to reach the lowest level in two and a half years in February 2019. After a hike to 18% in September 2018, the National Bank of Ukraine (NBU) left its key policy rate unchanged. In March 2019, the NBU pointed out that tight monetary conditions continue to be an important prerequisite for gradually reducing inflation to the 5% target in 2020, but also signaled the possibility of future rate cuts under certain conditions.

Accelerating inflation was reported for Russia and Turkey, which, in both cases, was strongly related to currency depreciations. In Russia, inflation doubled from a historical low in mid-2018 and reached 5.4% in February 2019. Besides a weaker ruble, increases of indexed housing and communal tariffs as well as an increase of the VAT rate in January 2019 put upward pressure on prices. The Central Bank of Russia (CBR) increased its policy rate in two steps by a total of 50 basis points in the second half of 2018 to preempt the impact of the VAT increase and to manage the risk of a potential currency shock from further U.S. sanctions.

In Turkey, the weakening of the lira pushed annual price rises to above 25% in October 2018. Since then, inflation has retreated somewhat on the back of weak demand conditions and a more stable value of the Turkish currency. After the currency depreciation had gained speed in the second quarter of 2018, the Turkish central bank (CBRT) hiked up its policy rate from 8% to 17.75% in June 2018. In September 2018, it increased its policy rate by a further 625 basis points to 24% after a further pronounced decline of the external value of the lira. Those measures were flanked by a number of liquidity and regulatory measures targeted at banks. Since then, the central bank has refrained from making any further adjustments to its policy rate. In late March 2019, however, the CBRT increased its average cost of funding from 24% to 25.5%, possibly in response to a renewed currency depreciation and a drop in foreign exchange reserves. It also decided to suspend its one-week repo auctions for an undetermined period and thus limited domestic liquidity in Turkish lira.

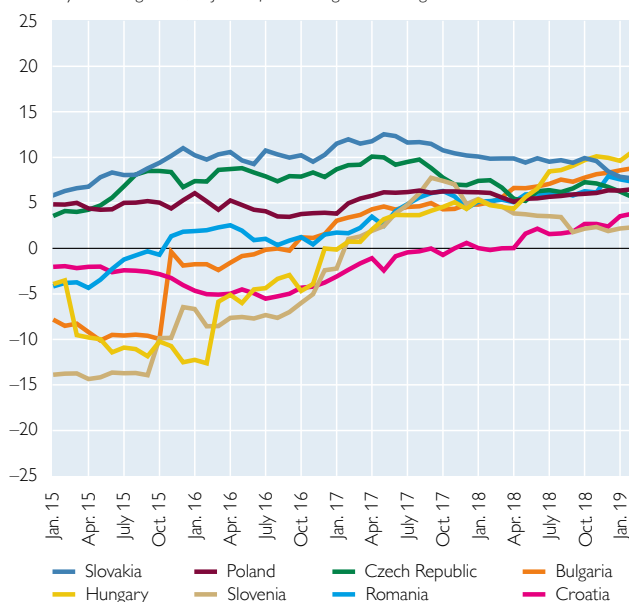
Growth of domestic credit to the private sector was solid and broadly in line with fundamentals throughout most of CESEE. Credit growth (nominal lending to the nonbank private sector adjusted for exchange rate changes) accelerated moderately in most CESEE countries, reflecting favorable general economic conditions in an environment of low interest rates and heightened competition among banks (see chart 1.2).

Among the CESEE EU Member States, the strongest credit expansion was reported for Hungary and Bulgaria in early 2019. In Hungary, lending

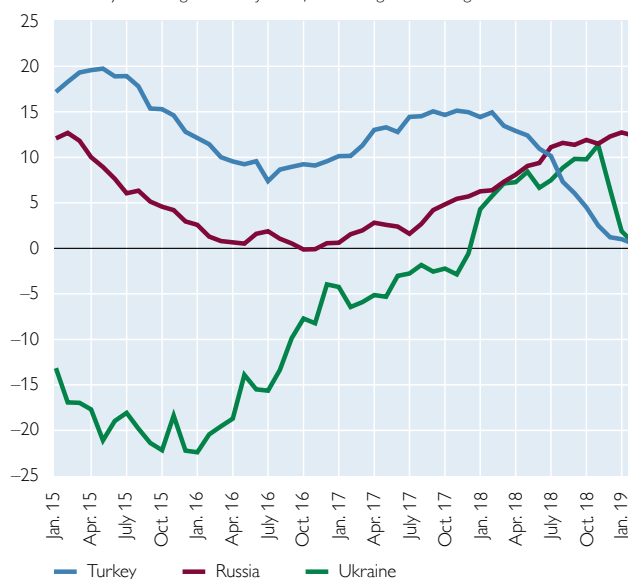
Chart 1.2

CESEE: 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.

was supported by various central bank measures. At the beginning of 2019, for example, the MNB expanded its toolkit by its “Funding for Growth Scheme Fix,” targeted at long-term lending to SMEs at fixed interest rates. In both countries, however, credit growth was especially strong in the household sector. Within this segment, housing loans have been growing particularly briskly.

Housing loans also grew vividly in other countries of the region, which went hand in hand with rising real estate prices. Housing prices in the CESEE EU Member States rose on average by some 8.4% year on year in the fourth quarter of 2018 (with growth rates ranging between 5.3% in Romania and 18.2% in Slovenia). While this represents some moderation compared to early 2018, housing prices continued to grow substantially more strongly than in the EU on average. Those dynamics were related to strong housing demand against the backdrop of high wage growth, healthy consumer sentiment as well as favorable expectations concerning future income and general economic conditions. At the same time, regulatory requirements and a lack of skilled labor in the construction sector prevented supply from keeping track with demand.

After several CESEE countries had introduced macroprudential measures and/or recommendations to put a brake on the expansion of housing loans, there was a further tightening of standards in the review period. The measures that are already in effect include debt service-to-income ratios (e.g. in the Czech Republic, Hungary, Romania, Slovakia and Slovenia), higher risk weights (e.g. in Poland and Slovenia), loan-to-value ratios (e.g. in the Czech Republic and Slovakia) as well as loan-to-income ratios (e.g. in the Czech

Republic and Slovakia).¹ So far, they have contributed to a notable slowdown in mortgage loan growth especially in the Czech Republic and Slovakia (where such regulations have been in force for longest).

In the Czech Republic and Slovakia, credit growth has declined from levels of 10% year on year and above, reaching around 6% and 8% respectively, in February 2019. Apart from slower housing loan growth, the imposition and subsequent increase of countercyclical capital buffers might have contributed to the moderation. In the Czech Republic, the buffer currently stands at 1.25% and is to be raised to 1.5% in July 2019 and 1.75% in January 2020. In Slovakia, the buffer will be raised to 1.5% in August 2019 from its current level of 1.25%.

Slovenia has reported the strongest deceleration of credit growth among the CESEE EU Member States. Growth rates came down from close to 8% in late 2017 to 2.3% in February 2019. The reduction was driven by credit to corporations, where lower demand for loans was primarily the result of a change in corporate financing methods, with other instruments (internal resources, equity financing and trade credits) having become more important.

Country-level bank lending surveys conducted by national central banks suggest some tightening of credit conditions in late 2018 and early 2019. Demand for loans has decreased, especially demand from households (e.g. in the Czech Republic and Romania), which may reflect a general slowdown of economic activity. Lending conditions also appear to have tightened somewhat according to several country-level bank lending surveys, especially for housing and consumer loans (e.g. in the Czech Republic, Romania and Poland).

Bank lending has gained momentum in Russia. However, this revival has been largely driven by retail loans, while credit to enterprises has remained sluggish. Mortgage loans and unsecured consumer credit have grown particularly briskly, which gives rise to some concern. The CBR responded by increasing risk weightings for high-interest mortgage and consumer loans and is planning to tighten requirements further if necessary. This has already been reflected in tightening price conditions for consumer loans.

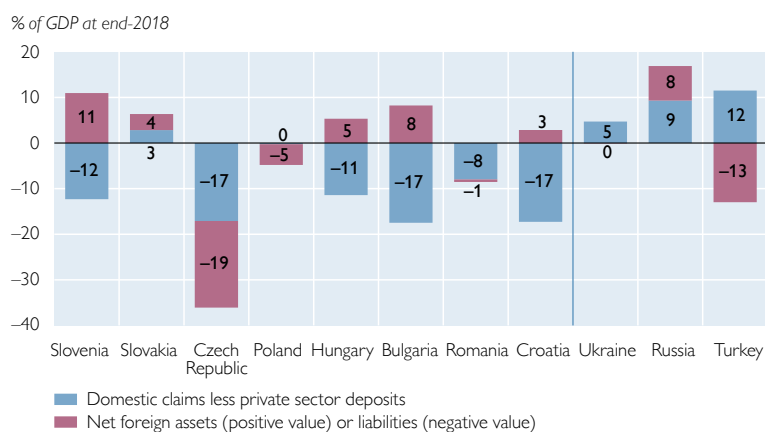
Turkey and Ukraine, by contrast, have experienced a notable deceleration in credit growth. In Ukraine, the growth of the domestic loan stock vis-à-vis the private sector peaked at 11.4% in November 2018, before decelerating to 1.9% in January 2019, partly related to write-offs. In general, banks expect lending growth to persist in 2019, according to the lending survey conducted by the Ukrainian central bank. Driven by local currency lending, household loans (in particular consumer loans) had been growing swiftly, with year-on-year growth hitting 26% in November, before coming down to 13.9% in January 2019. The growth of loans to nonbank corporations remained below 10% throughout 2018 and was marginally negative in January 2019.

In Turkey, credit growth came to a virtual standstill in early 2019, despite support from the government's subsidized loan scheme. Tightening global financial conditions, increasing risks and adverse exchange rate developments contributed to tightening loan supply, while weakening domestic

¹ See also Wittenberger, T. 2018. *Lending to households in CESEE with regard to Austrian banking subsidiaries and macroprudential measures addressing credit-related risks*. In: *Financial Stability Report 36*. OeNB. 82–94.

Chart 1.3

CESEE banking sectors: gap between claims and deposits, and net external position



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

demand and a pronounced rise in interest rates weighed on loan demand.

The strong growth of credit throughout 2018 has not impacted on the refinancing structure of CESEE banking sectors. The refinancing structure has increasingly been shifting toward domestic deposits over the past few years and also in the review period. This is especially true for the CESEE EU Member States where the gap between total outstanding domestic claims and total domestic deposits relative to GDP had not been substantial or had been negative at end-2018 (see chart 1.3). However, it has to be noted that this trend has come to a halt in Slovakia, where the gap turned positive in early

2017 and continued to expand moderately throughout 2018 as claims expanded substantially and the deposit base remained broadly stable. Compared to the CESEE EU Member States, Russia, Turkey and Ukraine exhibited positive funding gaps between 5% and 12% of GDP. In all countries, however, those gaps have narrowed, and especially so in Turkey (-4.4% of GDP between end-2017 and end-2018), reflecting a decline of the credit stock in relation to GDP.

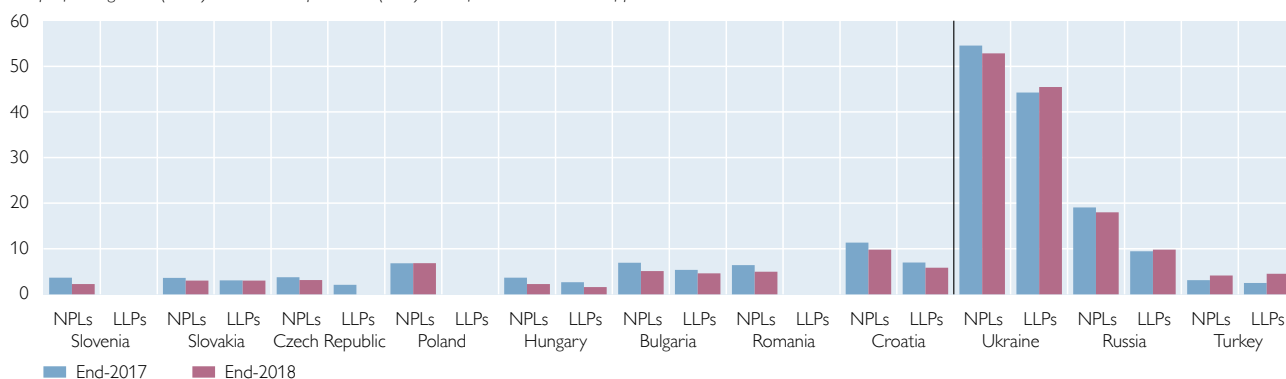
The banking sectors of four of the eleven CESEE countries under observation reported net external liabilities by the end of 2018. Liabilities were especially high in the Czech Republic, where they had shot up in anticipation of the abolition of the exchange rate floor of the Czech koruna against the euro in the first quarter of 2017 and have only moderately declined since. In Turkey, external liabilities declined notably in the review period.

Banks' asset quality continued to improve amid robust general economic activity and credit growth. In the CESEE EU Member States, the share of nonperforming loans (NPLs) in total loans declined notably, reaching between 2.2% in Hungary and 9.8% in Croatia at the end of 2018 (see chart 1.4). Hence, NPLs returned to pre-crisis levels throughout most of the region. In Hungary and Slovenia, NPL ratios even reached historical lows.

The strongest reduction in NPLs was reported for Bulgaria (-1.8 percentage points between end-2017 and end-2018). Following Bulgaria's application for close cooperation with the ECB in the context of the SSM, in November 2018, the ECB started its comprehensive assessment of the Bulgarian banking sector, which focuses on the country's six largest banks. The results of the related asset quality review and stress tests are expected to be published in July 2019 and would be followed by the implementation of identified follow-up measures (if any). The start of legislative amendments to prepare for participation in banking union has been accompanied by policy measures in other areas, in line with the Action Plan approved by the Bulgarian government in August 2018.

CESEE banking sectors: 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 across countries. NPLs generally refer to loans that are in arrears for more than 90 days except for the Czech Republic, Poland, Russia, Slovakia and Turkey, where NPLs refer to substandard, doubtful and loss loans.

Some improvement in asset quality was also reported for Russia and Ukraine. Standing at 18% and 52.9%, respectively, at the end of 2018, NPLs remained at a high level, however.

Unlike in the other countries of the region, the NPL ratio in Turkey increased from 3.1% at the end of 2017 to 4.1% at the end of 2018. The increase in NPLs reflected the financial difficulties faced by indebted companies, particularly those with debts in foreign currency. Moreover, the quality of bank assets might be lower than reflected in these figures due to sales of NPLs to asset management companies and the rollover of potentially distressed loans under the government's loan guarantee scheme. In addition, the Turkish Banking Regulation and Supervision Agency (BRSA) introduced several measures to facilitate loan restructuring, which took effect in September 2018. The BRSA undertook an asset quality review in December 2018, finding that the NPL ratio might increase to 6% of total loans.

The reduction of NPL ratios in many CESEE countries has been accompanied by a further decrease in foreign currency-denominated credit. This is especially true for lending to households, where the share of foreign currency-denominated credit in total credit is already close to zero in the Czech Republic, Hungary, Russia, Slovakia and Slovenia. In the other countries, the average share declined from around 28% at the end of 2017 to 23% in February 2019.

In Turkey, households have been banned from borrowing in foreign currency. The share of foreign currency loans in total loans to corporations, however, increased from 44% at the beginning of 2018 to 57% in August 2018, reflecting a large-scale depreciation in the exchange rate. The share came back to 47.8% in February 2019 as the exchange rate recovered some of its earlier losses and as the stock of foreign currency loans declined in exchange rate-adjusted terms.

Robust credit growth and improving asset quality have contributed to rising banking sector profitability in most of the CESEE region. The

average return on assets (ROA) in the CESEE EU Member States increased from 1.1% at the end of 2017 to 1.3% at the end of 2018 – one of the highest readings since 2008 (see chart 1.5). Throughout most of the region, operating income trended up somewhat, with positive momentum coming from noninterest income. At the same time, operating expenses remained broadly unchanged. Lower provisioning needs contributed strongest to rising profitability, especially in Bulgaria, Croatia and Romania. Hungary was the only CESEE EU Member State to report a decline of its ROA, which was primarily due to lower net reversals of provisions, but operating expenses increased somewhat too.

The Ukrainian banking sector has recovered from a long period of losses. An ROA of 0.9% at the end of 2018 reflected a massive decline of provisioning after the nationalization of Privatbank in December 2016 as well as positive effects of a comprehensive clean-up of the banking system carried out by the Ukrainian central bank in recent years.

In Russia, bank profitability surged on the back of lower provisions and higher interest income. The banking sector's ROA increased from 1% in 2017 to 1.5% in 2018. At the same time, the sector remained highly concentrated and controlled by the government. Five large state-owned banks account for 60% of the sector's assets, up from 52% at the end of 2013. After a series of bailouts in the second half of 2017, the sector clean-up has continued, and some smaller banks have received liquidity or capital injections.

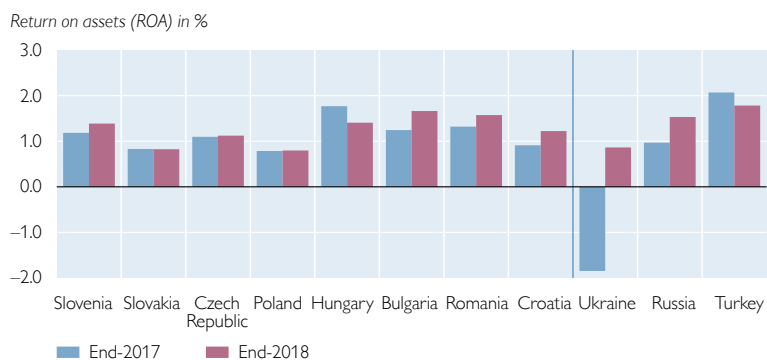
The profitability of Turkish banks declined in the review period and reached the lowest level in three years. This primarily reflected higher provisioning needs for nonperforming loans.

Capital adequacy ratios (CARs) have remained high in the CESEE EU Member States. At the end of 2018, CARs ranged between 18.2% in Slovakia and 22.9% in Croatia. A decrease in capitalization, however, was observed in Bulgaria and Hungary as risk-weighted assets increased notably.

In the other countries of the region, capitalization was markedly lower, ranging from 12.2% in Russia to 16.9% in Turkey. In Turkey, the sharp depreciation of the lira weighed on the capital ratio, given that risk-weighted assets are partially denominated in foreign currency. However, the Turkish supervisor's ruling that banks may use the exchange rate of end-June 2018 to calculate capital ratios contributed to a recovery of the capital base in the second half of 2018.

Chart 1.5

CESEE banking sectors: profitability



Source: IMF, national central banks, OeNB.

Note: 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.

Corporate and household sectors in Austria: income growth supports debt service capacity

Nonfinancial corporations' financing needs ebbed in 2018

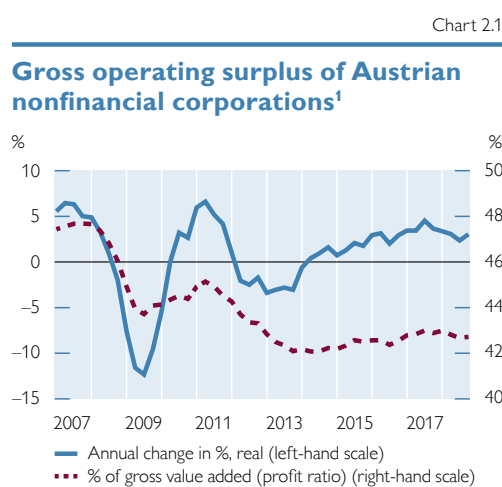
Economic growth supports profits of Austrian nonfinancial corporations

The Austrian economy was thriving for the second year in a row in 2018, driven by both domestic and foreign demand. With real GDP growing by 2.7%, the economic momentum was stronger in Austria than in Germany and the euro area. However, GDP growth weakened during 2018 and early 2019, reflecting a deterioration in external conditions as Austria's economy was increasingly confronted with a foreign economic slowdown. In 2018, the growth momentum of almost all investment components slowed, with the slowdown in equipment investment being most pronounced. Yet, from 2015 onward, the investment cycle has been unusually long by historical standards. This resulted in an increase in the investment ratio to 23.9% of nominal GDP, the highest value recorded since 2003.

Corporate profitability increased in 2018. Despite slowing down in the second half of 2018, economic growth still supported the earnings-generating capacity of Austrian nonfinancial corporations. According to the sectoral accounts, the gross operating surplus¹ of Austrian nonfinancial corporations continued to expand in 2018, posting a year-on-year increase of 3.0% in real terms in the fourth quarter of 2018 (based on four-quarter moving sums; see chart 2.1). In nominal terms, gross operating surplus rose by 4.7%. Although corporate profitability – as measured by gross operating surplus divided by gross value added – increased somewhat in the past two years, it remained subdued by historical standards. In the fourth quarter of 2018, the gross profit ratio amounted to 42.7%, up 0.6 percentage points from the post-crisis low registered in the second quarter of 2014.

Austrian nonfinancial corporations' need for financing decreased

The slowdown in corporate investment dampened the financing needs of Austrian nonfinancial corporations. Consequently, total financing (consisting of both internal and external financing) was down by 16.7% against 2017, after having increased over the previous three years (see chart 2.2). Internal financing (measured as the sum of changes in net worth and depreciation) remained the most important source of funds for nonfinancial corporations in Austria. At EUR 58.7 billion, it remained virtually unchanged in 2018 against the high levels registered in the previous two years as the rise in gross operating surplus was



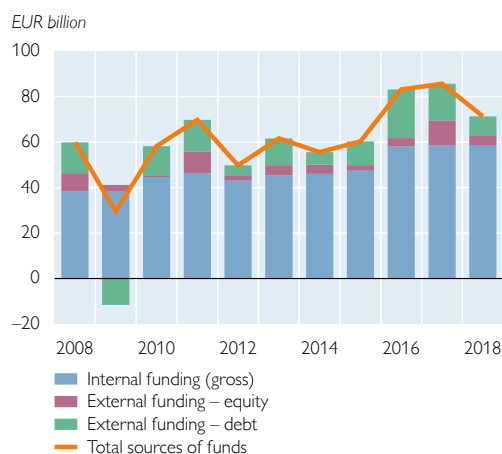
Source: Statistics Austria.

¹ Four-quarter moving sums.

¹ Gross operating surplus and mixed income (self-employed and other unincorporated business income).

Chart 2.2

Sources of funds for Austrian nonfinancial corporations



compensated by a decrease in nonfinancial corporations' net property income. The latter resulted from an increase in the distributed income of corporations consisting of dividends and withdrawals from income by owners for their own use.² Profits reinvested by foreign multinational corporations in their Austrian subsidiaries also declined (as did profits reinvested by Austrian corporations in their foreign subsidiaries). In contrast, the low interest rate environment continued to reduce the net interest burden of corporations. Overall, the earnings situation not only supported the corporate sector's internal financing potential but also alleviated its debt-servicing capacity.

Austrian nonfinancial corporations' recourse to external financing plummeted in 2018. At EUR 12.6 billion, external financing more than halved in 2018 compared to the previous year's figure. Roughly one-third (34%) of external financing came in the form of equity financing, which is a somewhat smaller share than in 2017. In absolute terms, equity financing fell by 61% year on year to EUR 4.3 billion. Equity financing took place exclusively in the form of unquoted equity, with listed shares falling by EUR 3.1 billion mainly due to a large delisting. In 2018, there had been one new listing of Austrian nonfinancial corporations on the Vienna stock exchange and one in early 2019. At 82%, the share of internal financing in total financing was higher in 2018 than in the previous four years, corroborating its significant role in corporate financing. Adding internal financing and equity-based external financing, the overall structure of corporate financing was again marked by a significant weight of own funds, which accounted for 88% of financing in 2018.

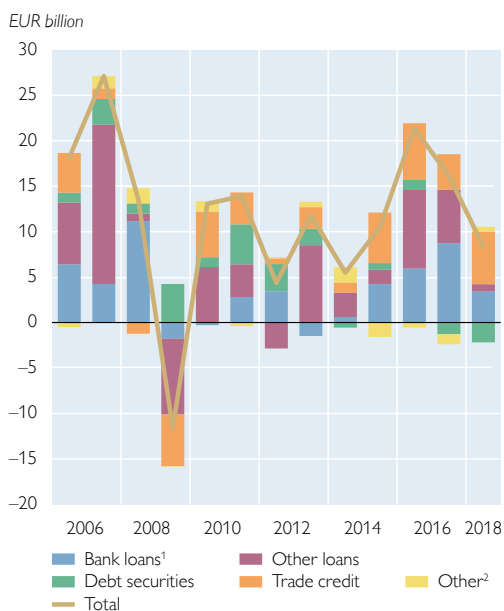
Debt financing goes down considerably

Debt instruments again provided the bulk of nonfinancial corporations' external financing in 2018. Although the volume of debt financing almost halved to EUR 8.4 billion (see chart 2.3), it accounted for about two-thirds of nonfinancial corporations' external financing. In the light of low interest rates, debt financing continued to be attractive. Net debt financing from abroad was negative at –EUR 7.4 billion in 2018. In contrast, financing from domestic sources was one-third higher in 2018 than in the year before, amounting to EUR 15.8 billion or almost twice the total volume of debt financing. Net debt flows from the domestic financial sector reached EUR 8.6 billion, almost all of which came from monetary financial institutions (MFIs). A substantial part of debt financing stemmed from other nonfinancial corporations. This financing mostly took the form of trade credit, which – including cross-border trade credit – increased by almost one-half compared to

² It has to be taken into account that this item is derived as a residual in the national accounts and is thus surrounded by a certain degree of uncertainty.

Chart 2.3

Debt financing of Austrian nonfinancial corporations



Source: OeNB.

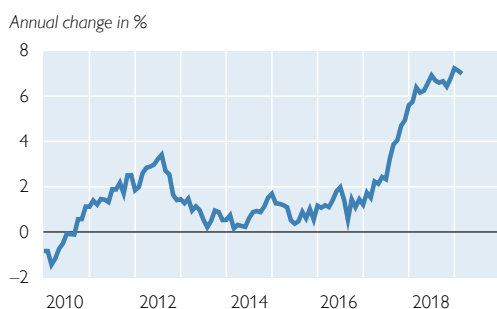
¹ Loans by domestic and foreign banks.

² Pension entitlements and other accounts payable.

Note: 2018 data are preliminary.

Chart 2.4

MFI loans to Austrian nonfinancial corporations



Source: OeNB.

than one-third of total credit expansion (i.e. change in stocks). Looking at maturities, the strongest contribution to this upturn came from loans with longer maturities (more than five years), which are most relevant for business fixed investment and account for the largest share in outstanding loan volumes. The highest growth rate, however, was recorded for short-term loans (with maturities up to one year).

2017 and thus continued to play a prominent role in debt financing. As trade credit typically develops in tandem with overall economic activity, it might be expected that with economic growth slowing, trade credit decelerated, too. Thus, the increase in trade credit might reflect supply rather than demand factors, such as better financial conditions of suppliers granting trade credit (e.g. higher profits or bank loans) or more positive assessments of buyers' creditworthiness. Loans from other enterprises, which largely reflect transactions within corporate groups, fell by roughly one-third. Looking at maturities, debt financing tended to take the form of short-term funding (with maturities up to one year), while the share of long-term funding decreased.

Loans by (domestic and foreign) banks accounted for 41% of debt financing in 2018. Whereas loans from foreign banks, which had exhibited buoyant growth in 2017 and 2016, decreased substantially in 2018, lending by Austrian banks to domestic nonfinancial corporations gained further momentum in 2018 and the first months of 2019.³ In March 2019, its annual growth rate (adjusted for securitization as well as for reclassifications, valuation changes and exchange rate effects) reached 7.0% in nominal terms (see chart 2.4). Broken down by industries (see chart 2.5), the increase in corporate loans in the twelve months to March 2019 was strongly driven by real estate activities, which accounted for more

³ At the cutoff date, financial accounts data were available up to the fourth quarter of 2018. More recent developments of financing flows are discussed based on data from the MFI balance sheet statistics.

Austrian nonfinancial corporations continued to have abundant liquidity buffers at their disposal, even if they decreased in 2018.

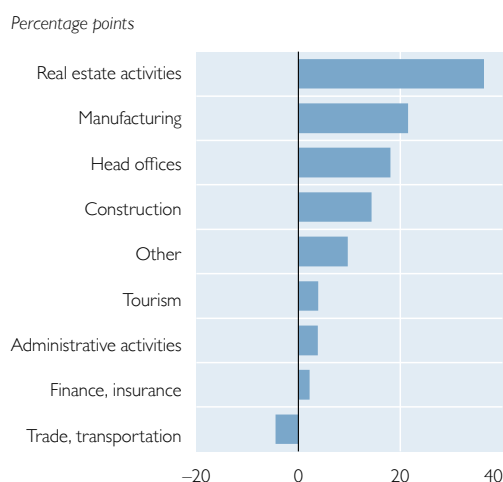
One factor behind the strong increase in short-term loans was the marked drawdown of credit lines. The total amount of undrawn credit lines⁴ available to enterprises, which had increased steadily from 2013 to 2017, fell by 16.4% from end-2017 to March 2019 (see chart 2.6). Yet, nonfinancial corporations continued to have substantial liquidity at their disposal. On the one hand, the levels of unutilized credit lines remained high by historical standards; on the other hand, nonfinancial corporations' transferable deposits continued to rise, albeit at a lower rate than in previous years (+5.3% year on year in March 2019). Apart from the low opportunity cost of holding liquid assets and the small yield difference relative to longer-term deposits, the continuing buildup of transferable deposits is also likely to mirror nonfinancial corporations' improved earnings.

In recent years, loan growth has been driven primarily by demand factors. Demand remained high, even if – after more than three years of continuously increasing loan demand – the banks surveyed in the euro area bank lending survey (BLS) reported a decrease in corporate loan demand in the first quarter of 2019 (see chart 2.7). This reduction was brought about mainly by funding requirements for fixed investment, which had been a major driver of loan demand in the previous years. Inventories and working capital, merger and acquisition activities as well as debt restructuring and renegotiations continued to support loan demand.

At the same time, Austrian banks' lending policies remained cautious. In the BLS, banks said that they continued their cautious lending policies in 2018 and the first quarter of 2019 (see chart 2.7). Among the factors affecting banks' stance toward lending to the corporate sector, reduced risk tolerance and banks'

Chart 2.5

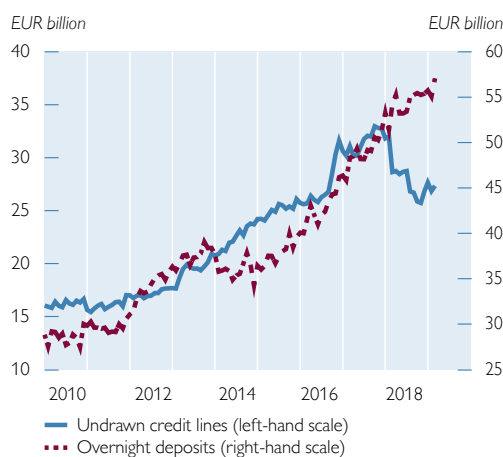
Contribution to loan growth in March 2019



Source: OeNB.

Chart 2.6

Indicators of Austrian nonfinancial corporations' liquidity



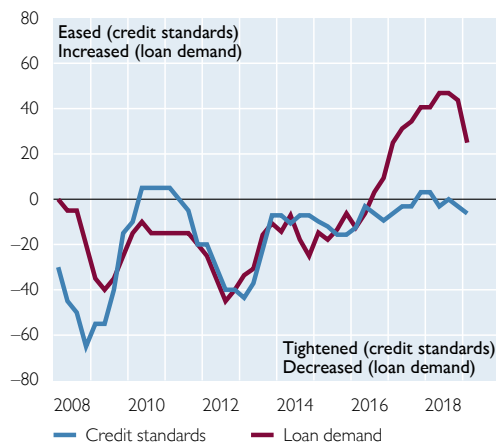
Source: OeNB.

⁴ According to the OeNB's statistics on new lending business.

Chart 2.7

Credit standards and demand for loans to nonfinancial corporations

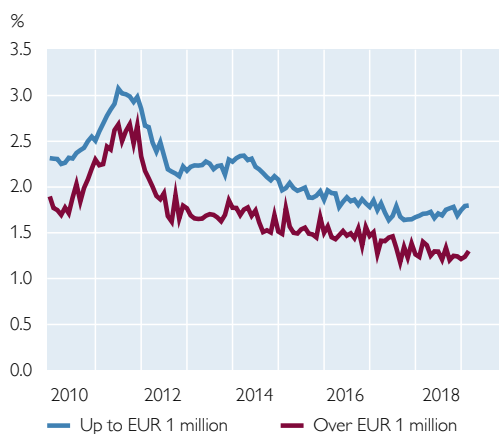
Net percentages, four-quarter moving averages



Source: OeNB (Bank lending survey).

Chart 2.8

Interest rates for variable rate MFI loans¹ to nonfinancial corporations



Source: OeNB.

¹ Loans with an interest rate fixation period of up to one year.

perception of risk factors, such as their assessment of borrowers' creditworthiness and collateral, were most often cited as having contributed to a more cautious stance. Pressure from competition, especially from other banks, which had caused banks to ease their credit standards in the first half of 2018, no longer did so in the second half of 2018 and early 2019.

Low bank lending rates continued to support lending to the corporate sector. Interest rates on new loans to nonfinancial corporations decreased by a further 12 basis points in the twelve months to March 2019 (see chart 2.8). During this period, the spread between interest rates on loans of smaller amounts and those on larger loans, which – given the lack of other data – often serves as an indicator of the relative cost of financing for SMEs, averaged 48 basis points and thus was 13 basis points higher than in the preceding twelve months. The results of the BLS show how banks differentiated interest margins by credit risk. According to the survey, the margins for average loans were eased (i.e. lowered) in most of 2018 and early 2019, mainly because of the competitive situation in the Austrian banking market. In contrast, respondent banks said that they increased the margins on riskier loans during the last few quarters, pointing to a differentiated risk assessment by the banks. Collateral requirements and other terms and conditions (such as noninterest

charges, loan covenants, loan maturity and loan size) remained broadly unchanged during the same period.

Debt securities' net contribution to corporate financing was negative in 2018. According to financial accounts data, corporate bond issuance was negative, amounting to –EUR 1.7 billion, low corporate bond yields notwithstanding. Yet, despite this decline, bonds have played a relatively important role in Austrian corporate finance, even if this form of funding is available only to a limited number of mainly larger nonfinancial corporations. By the end of 2018, the outstanding amount of long-term bonds issued by the corporate sector amounted to 9.5% of GDP.

Corporate sector debt-servicing capacity improved

The debt sustainability of Austrian nonfinancial corporations improved in 2018 due to enhanced profitability. In the course of the year, the corporate sector's debt-to-income ratio decreased considerably by 13 percentage points to reach 376% at the latest reading (see upper left-hand panel of chart 2.9). At 1.3%, the growth of corporate sector financial debt (measured in terms of total loans raised and bonds issued)⁵ remained well below the expansion rate of the gross operating surplus. The debt-to-equity ratio also fell by 0.6 percentage points to 86.8% in 2018 but remained higher in Austria than in the euro area.⁶

Together with the economic recovery, the low interest rate environment continued to support nonfinancial corporations' current debt-servicing capacity. Falling interest rates continued to alleviate the interest service burden on both variable rate loans and new debt. In 2018, the ratio of interest payments for (domestic) bank loans to gross operating surplus remained stable, reaching 2.9% in the fourth quarter of last year. This reflected the still high share of variable rate loans (with a rate fixation period of up to one year) in new loans, despite a reduction by 12 percentage points to 85% between mid-2014 and the first quarter of 2019 (despite a rebound of this share in the previous two quarters). While Austrian nonfinancial corporations therefore recorded lower interest expenses than their euro area peers – which alleviated current debt sustainability concerns – they still face a high exposure to interest rate risk. A rebound of interest rates could become a burden, in particular for highly indebted nonfinancial corporations. The Austrian corporate sector's exposure to foreign exchange risk remained low in 2018 and the first quarter of 2019, after having decreased continuously in the preceding years.

The declining trend in insolvencies observed in the past few years continued until early 2019. Since the fourth quarter of 2018, the insolvency ratio (i.e. the number of corporate insolvencies in relation to the number of existing companies) has fallen below 1%. This low level may be attributed to both the moderate increase in debt financing in the past few years and the low interest rate level, which makes debt servicing easier even for highly indebted companies.

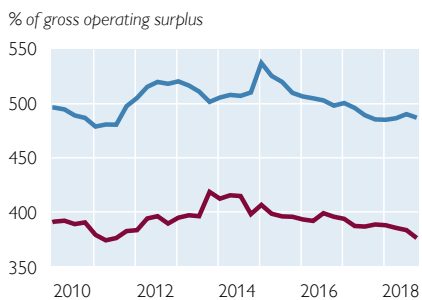
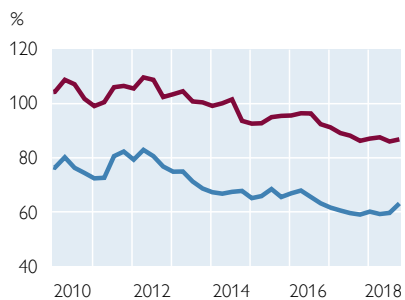
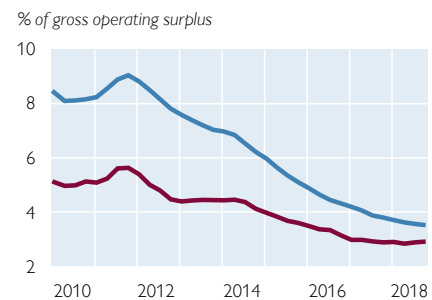
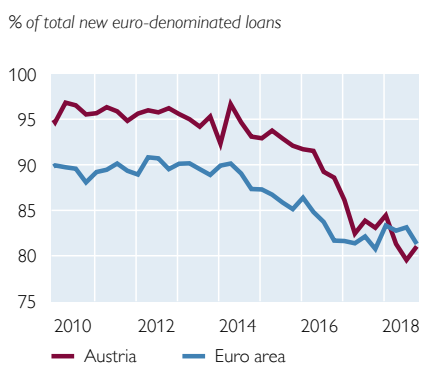
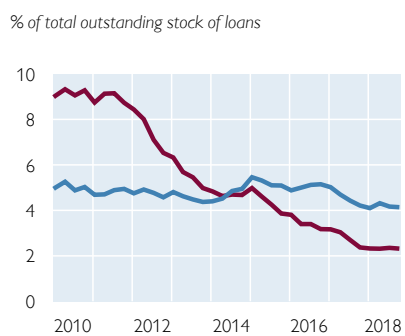
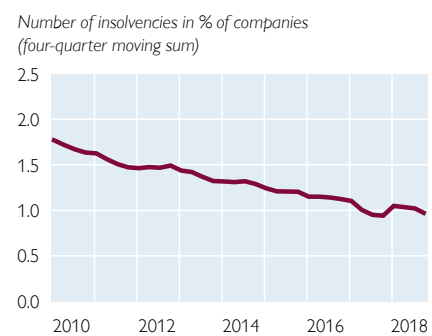
Household loans maintain their momentum

Buoyant household income growth

Austrian households saved more in 2018 than in 2017. The still favorable cyclical position of the Austrian economy was reflected in labor market developments, with the number of employees growing by 2.2% in 2018. This resulted in a decrease in the unemployment rate (Eurostat) from its peak of 6.0% in 2016 to 4.8% in 2018. In this environment, compensation of employees gained additional momentum and grew by 4.7% in nominal terms. This marked increase was driven

⁵ This measure follows Eurostat's and the European Commission's debt measures for the macroeconomic imbalance procedure (MIP) surveillance mechanism. It excludes pension scheme liabilities, which are not very significant in Austria, and other accounts payable, including trade credit and other items due to be paid, mostly on a short-term basis. These items essentially constitute operational debt, i.e. liabilities that a nonfinancial corporation incurs through its primary activities.

⁶ According to international conventions, financial accounts use market prices to value equity on the liabilities side of nonfinancial corporations' balance sheets.

Risk indicators for Austrian nonfinancial corporations**Debt****Debt-to-equity ratio****Interest expenses¹****Variable rate loans****Foreign currency loans****Insolvencies**

Source: OeNB, ECB, Eurostat, KSV 1870.

¹ Figures for the euro area represent only interest expenses on euro-denominated loans.

by the growth in employment numbers and a strong rise in bargained wages. Net mixed income, operating surplus and property income also experienced high growth. Altogether, households' disposable income expanded by 4.5%, which is well above the historical average. Coupled with broadly unchanged HICP inflation (2.1% in 2018), real disposable household income also increased at an above-average growth rate of 2.4%. As households aimed to smooth their spending levels over time, private consumption grew less, causing the saving ratio to rise to 7.4% in 2018. The increase in households' saving ratio was reflected in a rise in households' financial investments by 18.4% to EUR 13.0 billion in 2018. Yet, despite this increase, financial investments remained well below the values seen before the onset of the crisis (see chart 2.10).

Households' financial investments reflect a strong preference for liquid assets

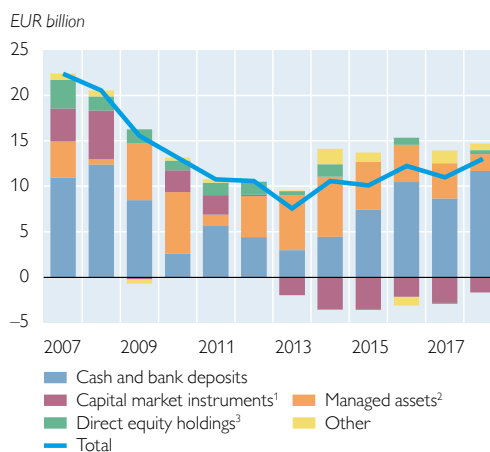
In the low nominal interest rate environment, households continued to display a strong preference for highly liquid short-term assets. In 2018, they shifted EUR 17.9 billion into overnight deposits with domestic banks (and another EUR 0.8 billion into cash holdings). For the fourth year straight, the buildup of overnight deposits surpassed total financial investments, implying a con-

tinuing considerable substitution of other financial assets.⁷ Bank deposits with an agreed maturity continued to decline, dropping by EUR 6.9 billion in 2018 (see chart 2.11). Taking a longer-term perspective, almost all of the financial investments made by households in the past decade took the form of cash and overnight deposits in net terms, while deposits with an agreed maturity were reduced by EUR 46 billion. As a result, the share of overnight deposits in total financial assets has more than doubled to 23% since end-2008, while the share of deposits with an agreed maturity has halved to 15%.

Financial investments in asset management instruments decreased strongly. Mirroring the development of deposits with an agreed maturity, investments in mutual funds, insurance policies and retirement products halved in 2018 against the previous year. Even investments in mutual funds, which had been buoyant in recent years, fell by 43.5% in 2018, reflecting the poor performance of equity markets in the final quarter of 2018. Net investments in insurance (both life and non-life) remained negative in 2018, amounting to –EUR 1.4 billion. For life insurance policies, disbursements outstripped contributions for the fourth year in a row. In the current environment of low interest rates, life insurance policies were not very attractive. A large proportion of gross inflows into life insurance policies did not result from current investment decisions, but rather reflected decisions made in the past – partly even before the onset of the crisis – given the long maturities and commitment periods involved. Life insurance policies often serve as repayment vehicles for foreign currency bullet loans (even if these have been converted into euro-denominated loans). Investments in pension vehicles were rather muted, too. Despite recovering somewhat from last year’s slump, net investments in pension

Chart 2.10

Households’ net financial investments

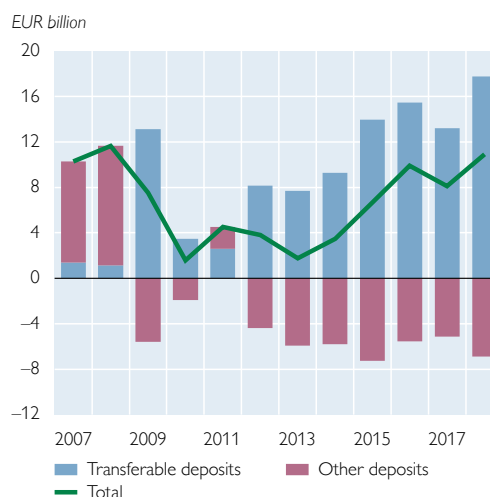


Source: OeNB.

¹ Debt securities and listed shares.² Mutual funds, insurance, pension entitlements and severance funds.³ Unlisted shares and other equity.

Chart 2.11

Households’ net investments in deposits



Source: OeNB.

⁷ For an analysis of the effect of model assumptions on interest rate risk as reported by banks, see the contribution by Kerbl et al. in this volume.

entitlements (including both claims on pension funds and direct pension benefits granted by private employers) stayed low, amounting to EUR 0.1 billion. Investments in severance funds remained broadly stable.

Households' net financial investments in direct capital market instruments declined further, remaining in negative territory in 2018 for the sixth consecutive year. As regards debt securities, this concerned in particular bonds issued by banks, reflecting continued redemptions over the past few years. In the period 2013–2018, households' securities portfolio shrank by EUR 15.7 billion. Over the same period, investments in listed shares increased slightly by EUR 0.3 billion, with issues of Austrian nonfinancial corporations being reduced by EUR 2 billion and replaced by stocks of foreign issuers of virtually the same amount.

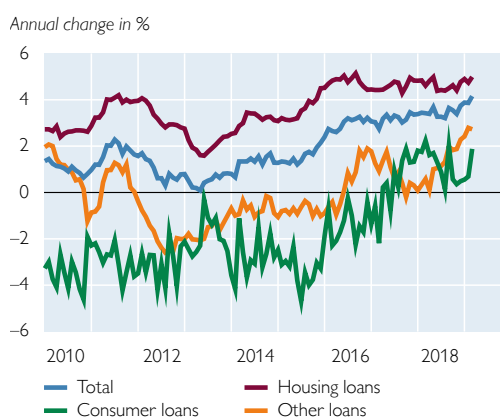
The Austrian household sector recorded large unrealized valuation losses in its securities portfolios in 2018, mainly reflecting falling stock prices in the fourth quarter of last year. For listed shares, the valuation losses amounted to EUR 2.7 billion or 11% of the holdings of listed shares at end-2017 (after valuation gains of 19% in the previous year). Securities also recorded valuation losses, as did mutual funds, whose losses amounted to EUR 4.3 billion or 7% of the volumes outstanding at the end of 2017. In total, these valuation losses amounted to almost half of the – equally unrealized – valuation gains of roughly EUR 15 billion recorded by the Austrian household sector between 2012 and 2017. While these developments point to revaluation risks in household portfolios, the low investments in capital market instruments suggest that there are few indications that households made up for low interest rates by investing in riskier assets in a search for yield in the past few years. What is more, capital market investments in general and investments in stocks in particular are very much concentrated in the portfolios of higher-income households, which have a higher risk-bearing capacity, as the results of the Household Finance and Consumption Survey (HFCS) for Austria show.⁸

Loans to households continue to grow

The growth rate of bank lending to households increased noticeably in recent months. In March 2019, bank loans to households (adjusted for reclassifications, valuation changes and exchange rate effects) rose by 4.2% year on year in nominal terms. Euro-denominated loans continued to grow briskly (by 6.1%), while foreign currency loans continued to contract at double-digit rates. By March 2019, they had fallen by 12.5% year on year. The dynamics of loan growth is expressed by the fact that loans for all purposes showed positive nominal year-on-year growth rates (see chart 2.12). Consumer loans grew by 1.9% year on year, and other loans by 2.7%. The main contribution to loan growth came from housing loans, not only because they are the most important loan category for households – accounting for more than two-thirds of the outstanding volume of loans to households – but also because they registered the highest growth rate among all loan categories, reaching 5.0% year on year in March 2019. The increase in loans

⁸ See, for example, Bekhtiar, K., P. Fessler and P. Lindner. 2019. *Risky assets in Europe and the US: risk vulnerability, risk aversion and economic environment*. ECB Working Paper Series No 2270. April. See also Lindner, P. and V. Redak. *The resilience of households in bank bail-ins*. In: *Financial Stability Report 33*. OeNB. 88–101.

Chart 2.12

Loans to households

for house purchases reflects the rise in the number and volume of real estate market transactions, which gained momentum in 2018 following a stagnation in 2017. In 2018, the transaction volume increased by 13.3% to EUR 31.9 billion.

Credit terms continued to be favorable. Interest rates for new bank loans decreased slightly below the already very low levels recorded in the preceding years. At 1.77%, average interest rates on euro-denominated housing loans to households were 5 basis points lower in March 2019 than one year earlier. The interest rate on variable rate housing loans decreased by 4 basis points to 1.49%. In contrast,

non-interest price elements are likely to have increased slightly. The effective annual rate of interest on housing loans, which reflects total borrowing costs (interest rate and other price elements), decreased by 2 basis points year on year to reach 2.23% in March 2019. The conditions for taking out housing loans became tighter over the past two years, too. According to the results of the BLS, banks slightly tightened their credit standards for housing loans to households in 2018 and the first quarter of 2019. Since the second half of last year, banks have no longer recorded an increase in households' demand for housing loans.

Households' currency and interest rate risks

Households' debt-to-income ratio remained broadly stable at 90%. By the end of 2018, the household sector's total gross liabilities amounted to EUR 191.7 billion according to financial accounts data, up 3.2% in nominal terms against one year earlier. Accordingly, the debt ratio of Austrian households remained lower than that of households in the euro area (see upper left-hand panel of chart 2.13).

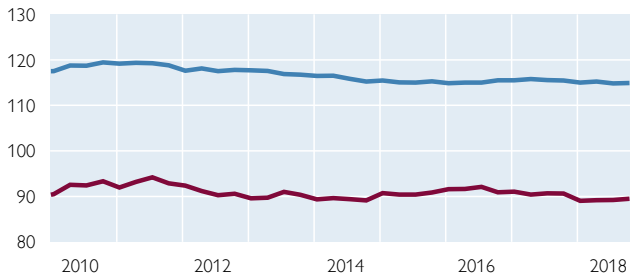
The share of variable rate loans continued to decrease in 2018 and early 2019. In the first quarter of 2019, loans with an initial rate fixation period of up to one year accounted for 54% of new lending (in euro) to households compared to 86% in the same quarter four years earlier. Over the same period, their share in housing loans narrowed from 83% to 44%.⁹ But despite this recent decline, the share of variable rate loans is still quite high when compared to the euro area average. At the same time, this implies lower current interest expenses resulting from a positive slope of the yield curve, which favorably affects current debt servicing. In the fourth quarter of 2018, households' interest expenses equaled 1.6% of their aggregate disposable income, more than 2 percentage points less than in 2008, i.e. the year before interest rates had started to fall. However, the high

⁹ In return, new housing loans with a very long interest fixation period (more than ten years) increased from less than 2% in 2014 to one-third in the first quarter of 2019.

Indicators of household indebtedness

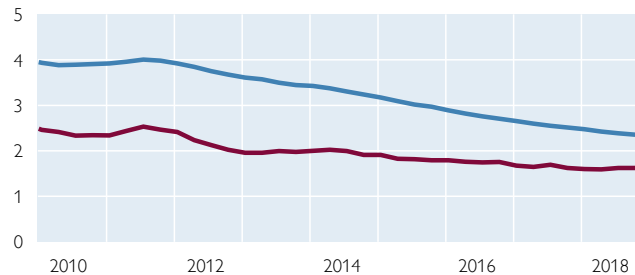
Liabilities

% of disposable income



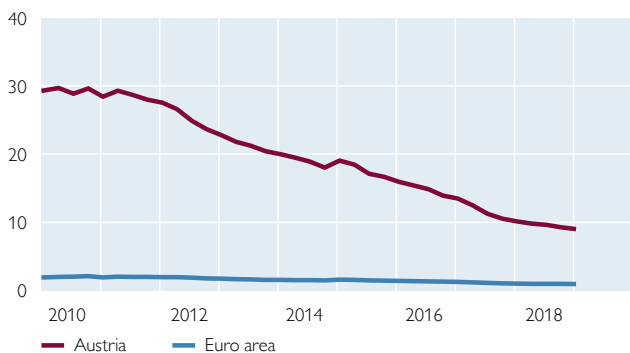
Interest expenses¹

% of disposable income



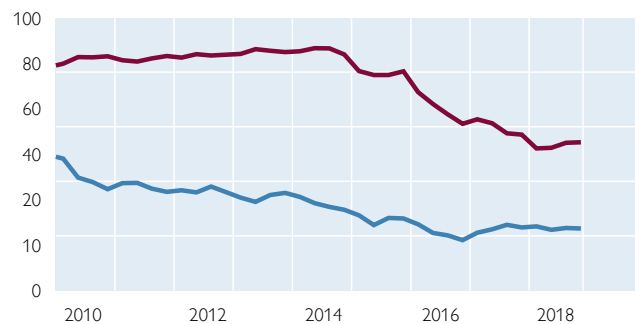
Foreign currency loans

% of total outstanding stock of loans



Variable rate loans

% of total new euro-denominated loans



Source: OeNB, Statistics Austria, ECB, Eurostat.

¹ Figures for the euro area represent only interest expenses on euro-denominated loans.

share of variable rate loans in total lending implies a considerable exposure of the household sector to interest rate risks over the medium term.

The share of foreign currency loans had fallen to 9.0% by the first quarter of 2019, less than one-third of the peak value reached ten years ago. The foreign currency share varies considerably depending on a loan's purpose. For housing loans, it was 11.4%, for consumer loans 2.5% and for other loans 4.6%. Almost all outstanding foreign currency-denominated loans are denominated in Swiss franc (close to 97%). Despite their ongoing reduction, outstanding foreign currency loans remain a risk factor.

Austrian households' debt service over the past ten years

Servicing outstanding debt constitutes a relevant expenditure item for households. Based on reporting data to the OeNB, this box presents an estimation of the debt service – defined as the sum of interest expenses and repayments – of Austrian households (including non-profit institutions serving households) for the period from 2009 to 2018. While interest expenses, which have been regularly presented in the OeNB's Financial Stability Report, can be calculated relatively easily using these data, estimating repayments is prone to greater uncertainty as data have not been available for some loan categories. In principle, repayments are computed as the difference between newly granted loans in a given period (gross lending) and the change in outstanding loan volumes over this period (net lending), adjusted for reclassifications, valuation changes and exchange rate effects.¹⁰ Given that repayments are calculated as a residual, they are surrounded by a certain degree of uncertainty.

The left-hand panel of chart 2.14 displays the development of Austrian households' debt service between 2009 and 2018. Over this period, households' annual interest expenses declined by EUR 1.6 billion or around one-third to EUR 3.4 billion. More than two-thirds of this decline were attributable to euro-denominated loans, and close to one-third to foreign currency loans. By contrast, in the same period, repayments increased by EUR 6.6 billion or 41% to EUR 22.6 billion. Repayments of euro-denominated housing loans doubled between 2009 and 2018 (+100%), while repayments of euro-denominated consumer and other loans increased only slightly (+14%). Repayments of foreign currency loans, whose portfolio has been steadily reduced in recent years, declined (–13%).

Adding interest expenses and repayments, households' debt service amounted to EUR 26.0 billion in 2018, EUR 5.0 billion or 23.7% more than in 2009. In 2018, euro-denominated housing loans accounted for more than half (52%) of Austrian households' debt service, euro-denominated consumer and other loans for 41%, and foreign currency loans for 7%. Assuming that most of the foreign currency loans are used for residential purposes, housing loans accounted for roughly two-thirds of total debt servicing in 2018. Over the whole period under review, debt servicing hovered around 12% of the household sector's disposable income. However, relating debt service expenses to the income of indebted households – which is more relevant from a macroprudential point of view – the debt service ratio came to 24%, using data on the share of indebted households obtained from the 2014 HFCS survey.

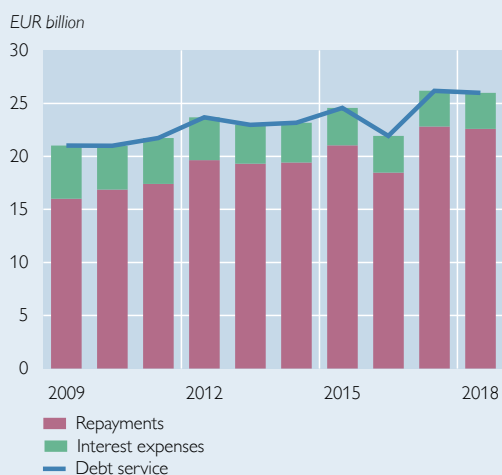
The right-hand panel of chart 2.14 breaks down the growth of households' debt service between 2009 and 2018 into the factors driving this growth. From 2009 to 2018, the largest contribution (EUR 7.2 billion) came from the rise in outstanding loans. At the same time, declining interest rates had two divergent effects on households' debt service: On the one hand, they reduced interest expenses; on the other hand, they increased repayments in loan schemes with constant annuities as interest rate fluctuations affect the amount of both interest expenses and repayments of the annuities. A falling interest rate means that a smaller part of the annuity goes toward interest expenses and a larger part toward the repayment of the outstanding loan. In addition, given falling interest rates in recent years, borrowers increasingly resorted to repaying higher-yielding loans ahead of schedule. This is reflected in the increase of "other repayments" (see chart 2.14), which also includes repayments of bullet loans. Another factor driving the growth of households' debt service arises from the assumptions underlying the annuity formula, which is used to estimate the drivers of repayments. According to this factor, falling interest rates let repayments rise. However, since in practice, interest rates are fixed for a large part of loans, the increase in repayments of the annuity formula is underestimated, which results in an increase in the residual "other repayments." Overall, lower interest

¹⁰ See Schneider, M. and W. Waschiczek. 2018. *Schuldendienst der privaten Haushalte in Österreich 2009 bis 2017*. In: *Statistiken, Daten & Analysen Q3/18*. OeNB. 57–75 (available in German only).

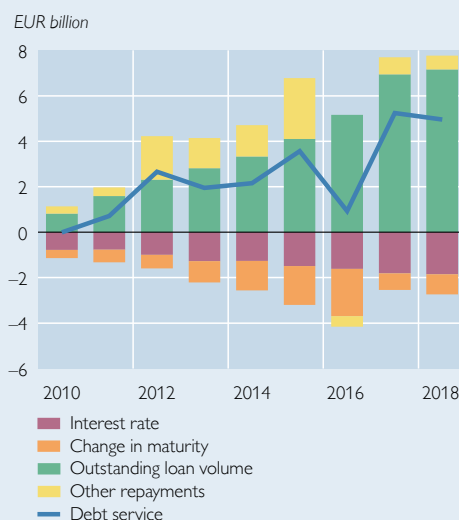
Chart 2.14

Debt service of Austrian households

Debt service by components



Cumulated change since 2009 by driving factors



Source: OeNB.

rates reduced households' debt service by EUR 1.8 billion, according to these calculations. The increase in the maturity of outstanding loans that took place between 2009 and 2018 had a dampening effect (–EUR 0.9 billion) on households' debt service. This results from the fact that for loans with fixed regular annuities, the share of repayments in the installment varies over time, being very small initially and increasing over the life of the loan. As the maturity of a loan portfolio increases, the share of repayments decreases (and that of interest expenses increases).

In addition to these direct effects, lower interest rates also had indirect effects on debt servicing. To the extent that the decline in interest rates increased the affordability of loans, enhanced credit demand, and thus contributed to the rise in real estate prices, it increased, at the same time, households' financing requirements for real estate acquisition and, subsequently, loan volumes and debt service expenses. While this effect is implicitly included in the increase in outstanding loan volumes, it should be, economically, attributed to the interest rate. Higher funding requirements as a result of higher real estate prices (and thus, indirectly, lower interest rates) may also have contributed to the extension of residual maturity observed during the period under review.

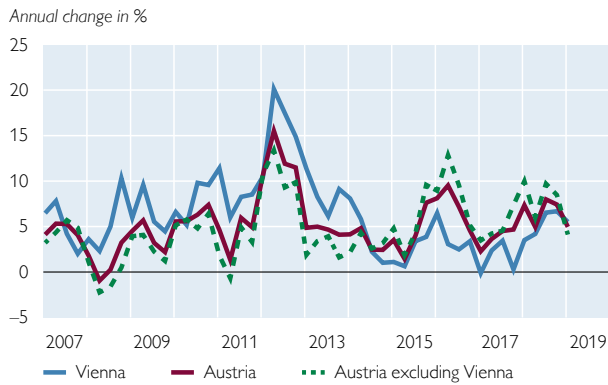
From a macroeconomic perspective, funds used for debt servicing expenditures are not available for consumer spending. Yet, paying off loans faster may bolster private consumption in the future. At the same time, faster debt reduction has helped households to secure or strengthen their repayment capacity.

Residential property prices in Austria have continued to increase

The upward trend in residential property prices in Austria continued in 2018 and early 2019. In the first quarter of 2019, overall price increases reached 5.0% year on year. After more than four years, prices rose faster in Vienna (+5.5%) than in the “Austria excluding Vienna” aggregate, which posted a growth rate of 4.1% in the first quarter of 2019. In recent years, housing supply has started

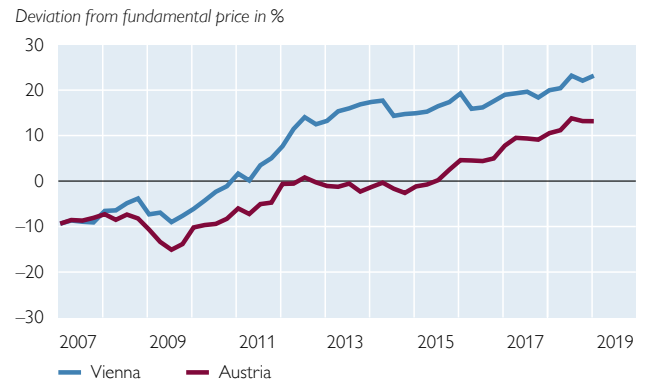
Austrian residential property market

Residential property prices



Source: Vienna University of Technology, OeNB.

OeNB fundamentals indicator for residential property prices



to catch up with housing demand. With the construction industry responding to the rising demand, production in building construction expanded by 7.0% in 2018.¹¹ Reflecting these price dynamics, the OeNB fundamentals indicator for residential property prices in Vienna increased slightly to 23.2% in the first quarter of 2019. For Austria as a whole, the indicator reached 13.2%, implying that prices do not reflect fundamentals and that the increasing overvaluation observed in recent years has continued.¹²

¹¹ See Schneider, M. 2019. Exploring supply-demand imbalances in Austria's housing market. In: Monetary Policy and the Economy Q3/19. OeNB. Forthcoming.

¹² For an analysis of the recent developments in the Austrian real estate market, see <https://www.oenb.at/Publikationen/Volkswirtschaft/immobilien-aktuell.html> (available in German only). Further analyses and data on the Austrian real estate market can be found at <https://www.oenb.at/en/Monetary-Policy/focus-on-real-estate-market-analysis.html>.

Austrian financial intermediaries: bank profits reach another post-crisis high, while insurance sector results are under pressure

Austrian banks have continued to benefit from the favorable economic environment

Consolidation process within the banking sector continues

Banks continue to dominate the Austrian financial sector, but their share has decreased over the last years. In 2008, banks still had a market share in the Austrian financial sector of well over 80%. However, in the wake of the financial crisis, banks have shrunk their balance sheets and embarked on a consolidation path. At the end of 2018, banks made up three-quarters of the Austrian financial sector (see chart 3.1). At the same time, mutual funds and insurance companies have become more important, increasing their net asset value and total assets.

In 2018, consolidation among Austrian banks continued, but their balance sheets expanded. Compared to previous years, the pace of consolidation decelerated, with the number of banks declining by 5% to 597 at the end of the year. At the same time, banks' aggregate total assets increased by 4% to EUR 986 billion.

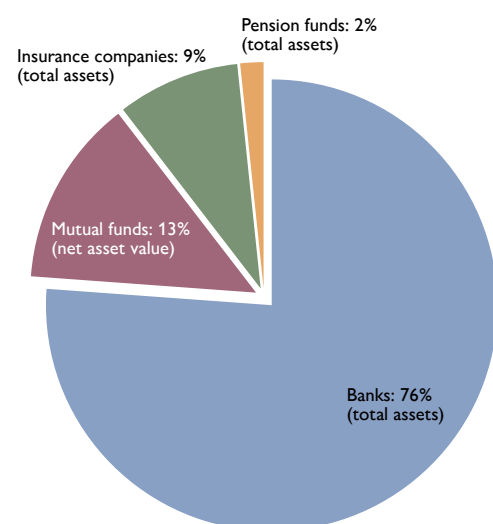
While Austria still has a large number of banks, the sector's total assets are concentrated at just a handful of institutions. The five biggest banks represent nearly half the sector's size in terms of total assets, and Austria's significant institutions¹ (i.e. those supervised by the ECB) represent nearly two-thirds.

But since the average Austrian bank has total assets of only EUR 2 billion, which is well below the European average of EUR 24 billion,² it is important to continue with the consolidation process to achieve further synergies.

Foreign claims of Austrian banks continued to increase, driven by an expansion in neighboring countries. As of end-2018, the Austrian banking sector's foreign exposure amounted to EUR 375 billion, which includes the assets of 55 subsidiaries, 219 branches as well as direct cross-border activities. This represented an increase by 3% compared to the previous year. Although Austrian banks expanded their activities in Germany and Switzerland in 2018, more than 60% of the sector's

Chart 3.1

The Austrian financial sector at a glance



Source: OeNB, FMA.

Note: Data as of end-2018.

¹ Significant institutions including UniCredit Bank Austria, which is a subsidiary of the Italian UniCredit Group.

² Source: ECB.

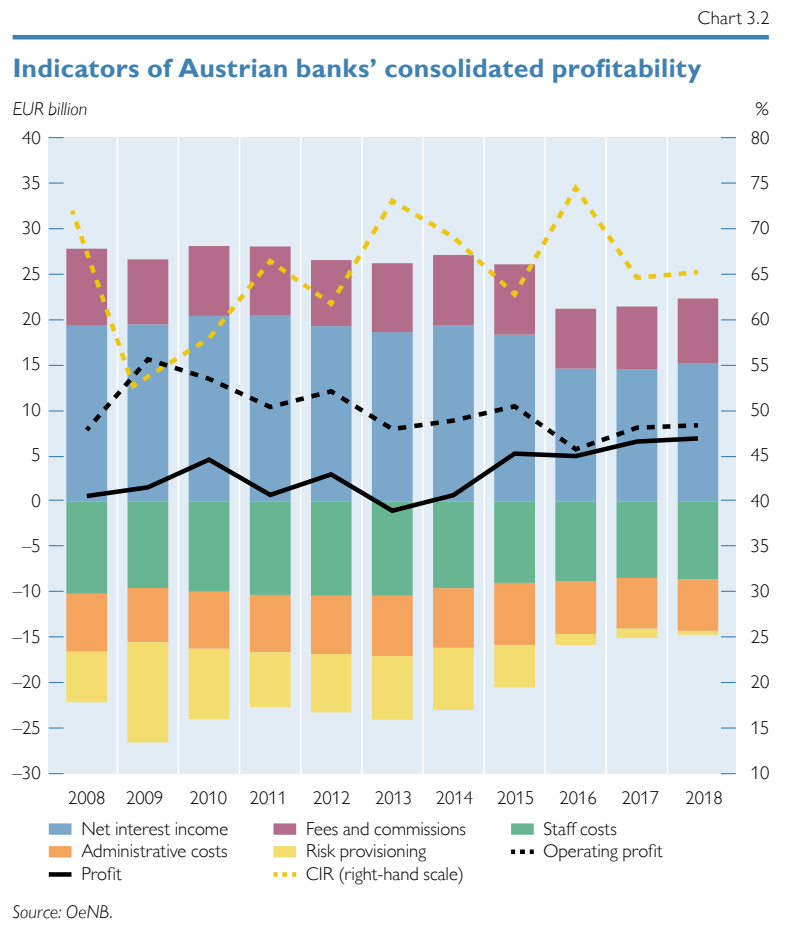
exposure were still claims on countries in CESEE. Overall, Austrian banks continued to strengthen their business focus on EU countries.

Bank profits at a post-crisis high

Austrian banks continued to benefit from macroeconomic tailwinds in 2018. Their consolidated profits reached another post-crisis high at EUR 6.9 billion, which implies a substantial year-on-year increase of 5% (see chart 3.2) and a return on assets of 0.8%, with the latter being well above the average EU level of 0.4%.³

The 5% increase in operating income to EUR 24 billion was supported by improvements in net interest income as well as fees and commissions. These two sources of revenue, which made up more than 90% of Austrian banks' income in the last years, increased by 5% and 3%, respectively, in 2018. While fees and commissions continued their gradual expansion, net interest income rose substantially in 2018 after having been under pressure for several years. The increase in 2018 was due to both volume and price effects, given that total assets rose and that the consolidated net interest margin expanded slightly (to 1.6%). It is too early to say, however, whether these improvements mark a turning point and can be sustained in the years to come, given the macroeconomic slowdown and the prolonged low interest rate environment.

The rise in income was outpaced by operating costs, however, and thus cost efficiency has remained weak. Driven by increasing impairments on investments in associated companies, Austrian banks' expenses grew by 6% year on year, that is, slightly faster than revenues (both staff and administrative costs rose only moderately at 2% and 1%, respectively). Consequently, the sector's cost-income ratio (CIR) worsened, albeit only slightly, and is still at an elevated level of 65%. In an international comparison, Austrian banks' CIR corresponds to the weighted average for EU banks. This average, however, is driven by German and French banks, whose CIRs of 82% and 73%, respectively, are significantly above the average.⁴ Given that most banking systems – especially in CESEE and the Nordic countries – display better CIRs than Austrian banks, there seems to be room for improvement and lessons to be learned from best practice examples. Taking into account total operating



³ Source: EBA Risk Dashboard, data as of Q4 2018.

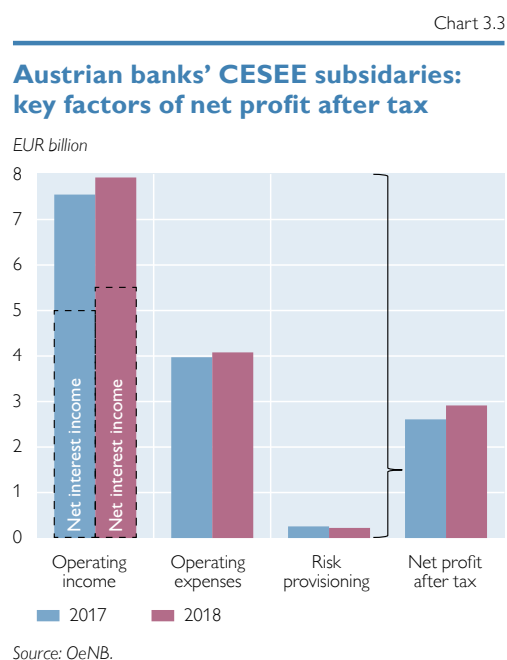
⁴ Source: EBA Risk Dashboard, data as of Q4 2018.

income and operating costs, Austrian banks earned an operating profit of EUR 8.4 billion in 2018, up 3% on the previous year.

Austrian banks' profits continued to be supported by falling risk provisions, which reached another historical low in 2018. Having declined substantially since the height of the financial crisis, provisioning for (mostly credit) risk was cut by more than half – as credit quality continued to improve – and stood at EUR 0.4 billion at year-end. As chart 3.2 shows, low risk costs in a benign macro-economic environment have supported rising profits over the last years, while operating profitability remained burdened by a high CIR. Therefore, Austrian banks should continue to address structural issues to foster the sustainability of their profits and ensure that they have enough room for maneuver in a potential downturn.

Other comprehensive income (OCI) complements a holistic profitability assessment of banks reporting under International Financial Reporting Standards (IFRS). It provides a view on unrealized profits and losses that do not flow through banks' profit and loss statement (P&L), but are directly recognized and accumulate in shareholders' equity. Thus, analyzing OCI provides an additional profitability measure that integrates a forward-looking view on banks' operations. In 2018, Austrian IFRS banks recorded an OCI of –EUR 0.9 billion – burdened by valuation losses on debt instruments at fair value – and have accumulated OCI in their equity of –EUR 7.6 billion (e.g. due to foreign currency translations or defined benefit pension plan adjustments), of which around half could flow through the P&L in the future.

Profitability of subsidiaries in CESEE has increased further



Austrian banking subsidiaries' business activities in CESEE in 2018 mirrored the benign macro-economic environment in the region. Their net profit after tax rose from EUR 2.6 billion in 2017 to EUR 2.9 billion in 2018 (see chart 3.3).⁵ This was attributable to strong loan growth in most CESEE countries that translated into a rise in net interest income and the historically low level of risk provisions. The highest net profits after tax in 2018 came from subsidiaries in the Czech Republic, Russia, Romania and Slovakia. The highest increase in net profits was registered at subsidiaries in Romania, the Czech Republic and Croatia.

Austrian subsidiaries in CESEE mostly lend to households. In absolute terms, loans of Austrian

⁵ Figures from sold units are not included for comparability reasons.

banking subsidiaries to nonbanks grew particularly strongly in the Czech Republic (+EUR 3.0 billion), Slovakia (+EUR 2.0 billion) and Romania (+EUR 1.5 billion) in 2018. Loan growth was funded by local deposits, which rose in the same manner, so that loan-to-deposit ratios stayed nearly unchanged. Overall, Austrian banking subsidiaries' credit growth in CESEE was 7% in 2018. The main driver were loans to households (in particular mortgage loans), which grew by 11% in the entire region. A breakdown by country reveals that loan growth to households was 9% in the Czech Republic, 11% in Slovakia and 12% in Romania in 2018. Loan growth to nonfinancial corporations was positive too, but far from vivid.

Net interest income, which makes up almost 70% of Austrian subsidiaries' operating income, rose by a strong 8% in 2018, while net interest margins remained almost unchanged. The increase in net interest income was most notable in the Czech Republic and Romania due to high credit growth and a rise in the central banks' policy rates. At the same time, the aggregate net interest margin of subsidiaries in CESEE, defined as net interest income to average total assets, stagnated at 2.7% year on year (as seen in chart 3.4). The margins at subsidiaries in Austria's neighboring countries are below this average, but their net interest income has benefited from a high volume of interest-bearing assets.

Low risk provisioning remained a key factor for profitability for Austrian banks' CESEE subsidiaries in 2018. In several countries, like Hungary, Ukraine, Albania or Slovenia, Austrian subsidiaries released more credit risk provisions than they built up. Furthermore, in most countries where subsidiaries' provisioning was still positive on balance, the buildup in 2018 was well below the previous year's. However, the coverage ratio of Austrian banks' CESEE subsidiaries remained high at 64% in 2018, up from 61% in 2017.⁶

Loan quality has improved thanks to lower nonperforming loans and higher loan growth

The loan quality of the Austrian banking sector continued to improve on the back of lower

Chart 3.4

Austrian banks' CESEE subsidiaries: net interest margins

Net interest income in % of average total assets

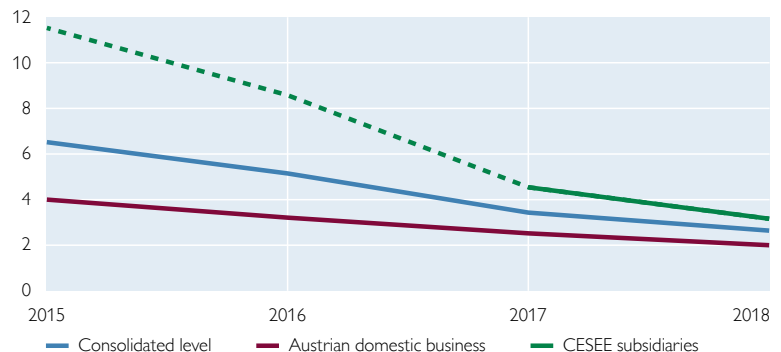


Source: OeNB.

Chart 3.5

Credit quality of Austrian banks

Nonperforming loans in % of total loans

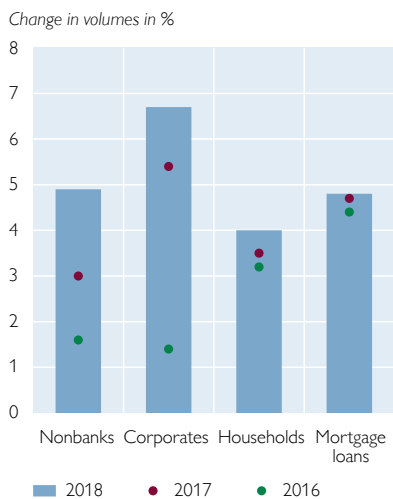


Source: OeNB.

Note: The ratio for CESEE subsidiaries prior to 2017 includes only loans to corporates and households.

⁶ See the EBA Risk Dashboard for a comparison of coverage ratios in Europe.

Chart 3.6

Growth of loans to nonbanks in Austria

Source: OeNB.

Note: Annual growth rates adjusted for exchange rate effects, write-downs and reclassifications.

nonperforming loans (NPLs) and higher credit growth. The consolidated NPL ratio went down to 2.6% as of end-2018, 80 basis points below the previous year's level (see chart 3.5). A breakdown by geographical segments shows that the NPL ratio in Austria was 2.0%, while Austrian subsidiaries in CESEE reduced their NPL ratio to 3.2%.

Reduced provisioning leads to a lower loan loss provision ratio.

Austrian banks were able to further reduce their risk provisioning due to the still favorable economic environment, but as a result, their loan loss provision ratio declined to 1.8%, well below the historical average of 2.6%. If banks had to increase the ratio up to this average, they would have to build up new provisions of nearly EUR 5 billion (assuming

a constant loan volume). Given that this buildup would be unlikely to take place in just one year, the resulting negative impact on profits would be spread over time, however.

Austrian banks' CESEE subsidiaries have also further improved their loan quality. Compared to the previous year, the NPL ratio dropped from 4.5% to 3.2% in 2018. At the country level, heterogeneity is still high: The NPL ratio remained below or close to the Austrian level in, for instance, the Czech Republic and Slovakia (1.2% and 2.7%, respectively) but was still elevated – albeit improving – in Croatia, Hungary and Romania (between 4.4% and 7.6%).⁷

Loan growth in Austria gained further momentum in 2018, especially in the real estate sector, leading also to improved credit quality indicators. Loans to nonbanks increased by 4.9% year on year compared to 3% one year earlier (see chart 3.6). The expansion was driven by lending to corporates (especially in residential construction) as well as the continued growth of mortgage loans to households. Cooperative banks and savings banks were the most active lenders in 2018, while building and loan associations reduced their outstanding loans to nonbanks.

⁷ For a comparison with average NPL ratios in CESEE markets, see chart 1.4. In general, Austrian subsidiaries in CESEE perform better than their competitors.

Box 2

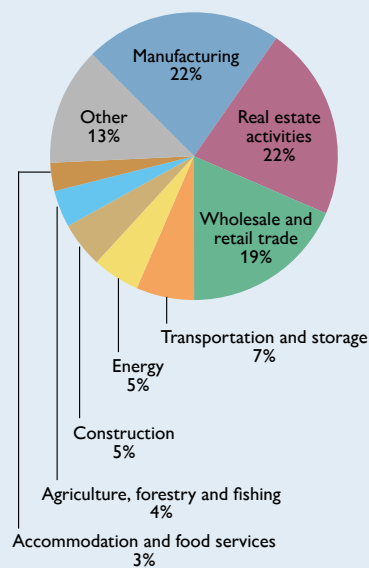
Austrian banks' corporate loan portfolios in CESEE

Austrian banks' corporate lending in CESEE is concentrated in eight sectors, and these loans accounted for 87% of the region's corporate loan portfolio at end-2018.⁸ The sectoral decomposition (see chart 3.7) also shows that the highest volumes by far were extended to the manufacturing industry, real estate activities, and the wholesale and retail trade sector. Over the last two years, smaller sectors recorded the highest growth rates, above all transportation and storage (+19%; see the bar chart of chart 3.7), but larger sectors also registered strong growth rates (wholesale and retail trade: +13%, manufacturing: +9%). Surprisingly, loans for real estate activities grew only slowly (+2%), while those to the construction industry even contracted by -10%. The latter development was mainly driven by a decline in loans in Croatia and Slovenia, partly due to portfolio adjustments and NPL sales at certain banks.

Chart 3.7

Austrian banks' corporate loan portfolios in CESEE

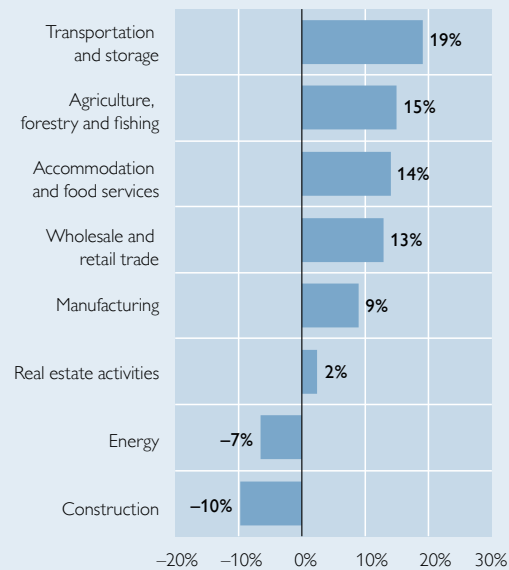
By economic sectors



Source: OeNB.

Note: Data as of end-2018.

Loan growth rates by borrower sectors from end-2016 to end-2018



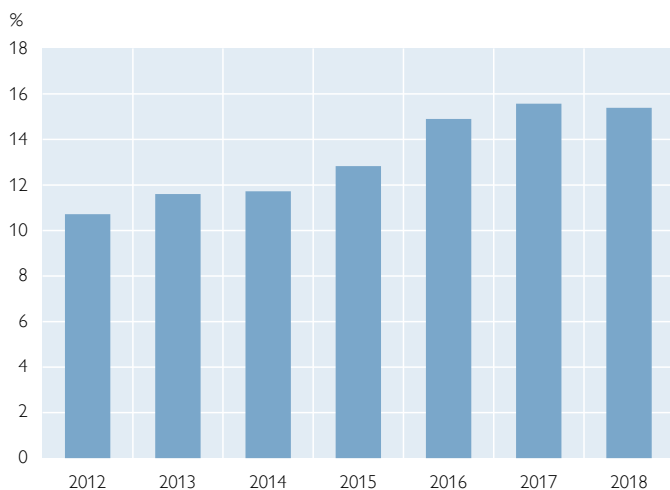
Source: OeNB.

Note: Given that the sale of Raiffeisen Polbank's core banking operations to BNP Paribas in 2018 limits comparability, the growth rates have been adjusted for this one-off effect.

⁸ The analysis includes direct cross-border lending and lending through banking subsidiaries.

Chart 3.8

Consolidated CET1 ratio of Austrian banks

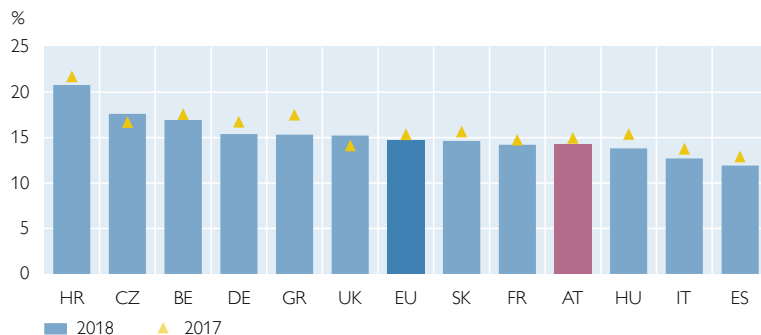


Source: OeNB.

Note: The ratio before 2014 is an approximation of the current Basel III regime.

Chart 3.9

CET1 ratios in selected European countries



Source: EBA, sample of reporting banks.

Capitalization of Austrian banks has slightly declined

Austrian banks' capital ratios declined in 2018 due to a rise in risk-weighted assets and the dividend payout ratio. The Austrian banking system's profit reached a post-crisis high in 2018 amid strong loan growth in both Austria and CESEE, but this also led to higher risk-weighted assets (+4% year on year). Furthermore, banks also chose to distribute a higher proportion of their profits to their shareholders in 2018: Compared to the previous year, Austrian banks doubled their dividend payout ratio to nearly one-third. As the increase in risk-weighted assets outpaced the increase in capital, the common equity tier 1 (CET1) ratio of Austrian banks declined and stood at 15.4% at the end of 2018 (18 basis points lower than in the previous year, see chart 3.8).

The slight deterioration in Austrian banks' capitalization was consistent with developments in other European banking sectors. According to data from the European Banking Authority (EBA), most European markets saw a reduction in banks' CET1 ratios in 2018. Austrian banks that report to the EBA had a CET1 ratio of 14.2% at the end of 2018 (see chart 3.9). This was below the European average of 14.7%, even though the average itself had declined. However, as an OeNB study

on the international comparability of risk weights⁹ has shown, there are statistically significant and economically important cross-country differences in risk weights that determine CET1 ratios. Due to a higher share of risk-weighted assets in total assets, Austrian banks have a CET1 ratio that is below the EU average, but a leverage ratio that is markedly better.

⁹ Kerbl, S. and S. Döme. 2017. Comparability of Basel risk weights in the EU banking sector. In: *Financial Stability Report 34*. OeNB. December. 68–89. https://www.oenb.at/dam/jcr:0b5b3df2-1579-486b-b455-1912828c1f2b/fsr_34_screen.pdf

Box 3

IMF Financial Sector Assessment Program in Austria in 2019

Austria is one of 29 countries whose financial sector the IMF deems to be systemically important, among other things because of its size and function as a regional financial hub for CESEE. Therefore, a mandatory comprehensive and in-depth assessment under the IMF's Financial Sector Assessment Program (FSAP) takes place every five years. The IMF conducted FSAPs in Austria in 2003, 2008 and 2013. The 2019 FSAP in Austria comprises three components: (1) sources, probabilities and potential impact of material risks to systemic stability in the near future; (2) the legal and regulatory financial stability framework; and (3) national institutions' capacity to deal with a financial crisis should risks materialize. It also includes an assessment of Austria's anti-money laundering and terrorist financing regulations. With respect to banking supervision, the focus of the Austrian FSAP is on the supervision of less significant institutions, as a detailed assessment of significant institutions was conducted under the euro area FSAP in 2018.

Austrian banks' liquidity positions are solid

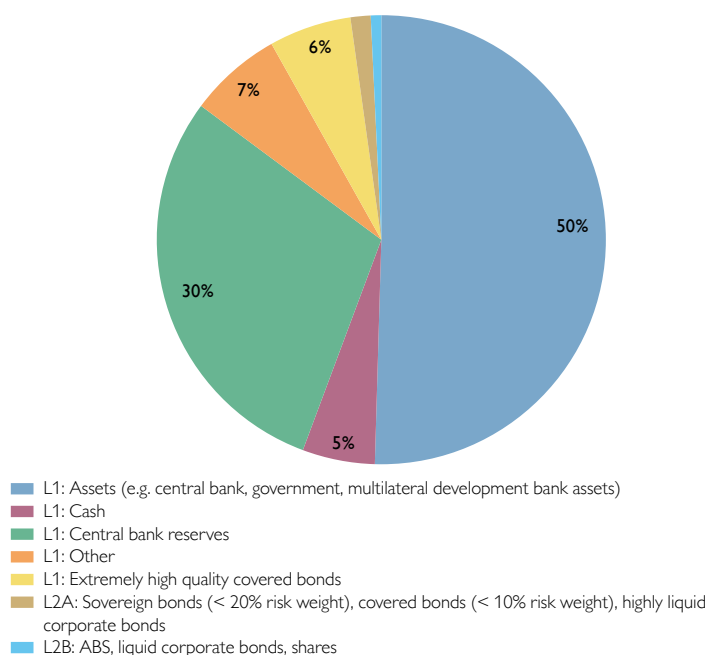
High liquidity coverage ratios (LCRs) attest to Austrian banks' solid short-term resilience against liquidity shocks. All Austrian banks report LCRs above the regulatory minimum. At the system level, the weighted average LCR on an aggregated currency basis stands at 145% at the unconsolidated level and at 149% at the consolidated level (as of end-2018). Over the last year, monthly LCRs have moved in a stable band between 134% and 153% without much volatility. The greatest contributors to net cash outflows in foreign currencies within the LCR for the Austrian banking system were the Czech koruna and the U.S. dollar. While the weighted average LCR in Czech koruny stood at 210%, the LCR in U.S. dollars was only 47% at the consolidated level.

The composition of Austrian banks' liquidity buffers has remained unchanged, consisting mainly of assets belonging to the highest category of eligible level 1 (L1) assets. In fact, the share of L1 assets (excluding high-quality covered bonds) amounted to 92%, while the share of L1 covered bonds rose slightly to 6% (see chart 3.10) at end-2018. Within the L1 assets category, cash, government bonds and central bank assets accounted for more than 88%.

Retail and corporate deposits are the main components of Austrian banks' funding mix. Funding in the capital market via the

Chart 3.10

Composition of Austrian banks' liquidity buffers



Source: OeNB.

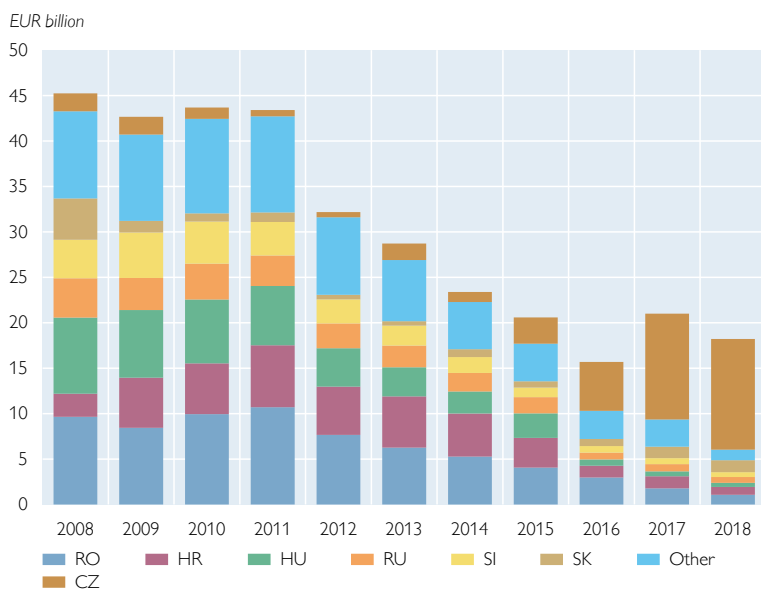
issuance of debt securities is mostly used by larger institutions. In terms of liability volumes, 60% are deposits, of which retail deposits account for the largest part, and only 14% are debt securities.

The Austrian unsecured money market has turned from a short-term liquidity-raising into a deposit-taking market, in which Austrian banks accept liquidity from banks operating in CESEE at a rate below the deposit facility rate.¹⁰ Looking at the Austrian unsecured money market loan network (i.e. all transactions in which either the loan originator or beneficiary is an Austrian bank), a deposit-taking business model seems to be emerging, where Austrian banks pay negative interest rates significantly below the Euro OverNight Index Average (EONIA) and below the deposit facility rate. In other words, they receive interest for taking in liquidity. Since the unsecured interbank market for Austrian banks currently consists of just a few hundred interbank loans per month, it could well be described as dried up. Also, in recent months, just a handful of money market loans have been granted with maturities longer than one week. This phenomenon is also prevalent in other euro area countries and makes it more difficult to develop a reference rate that is suitable to replace the Euro InterBank Offered Rate (EURIBOR).¹¹ However, the limited reliance of Austrian banks on the potentially volatile short-term unsecured funding market could also be interpreted as a positive factor for financial stability.

The refinancing structure of large Austrian banks' subsidiaries in CESEE remained sustainable in 2018.

Chart 3.11

Intra-group liquidity transfers to CESEE credit institutions



Source: OeNB.

In line with the Austrian supervisory guidance on strengthening the sustainability of the business models of large internationally active Austrian banks (“Sustainability Package”) adopted in 2012, the supervisory authorities have been monitoring the stock and flow loan-to-local stable funding ratios (LLSFRs) of Austria’s largest banks’ foreign subsidiaries.¹² As of end-2018, all 22 monitored subsidiaries of Erste Group Bank and Raiffeisen Bank International had a sustainable local refinancing structure (compliant with the guidance). The aggregated stock LLSFR remained broadly stable year on year (Q4 2018: 75%), and two-thirds of all subsidiaries had a ratio below 80%, which is well below the early warning threshold of 110%. Due to the subsidiaries’ stronger

¹⁰ The source for the analyzed unsecured money market data is TARGET2.

¹¹ It has to be noted that the underlying data only show loans that have been executed and do not include loans that have been rolled over.

¹² For further details, refer to <https://www.oenb.at/en/financial-market/financial-stability/sustainability-of-large-austrian-banks-business-models.html>.

reliance on local funding, the (gross) intra-group liquidity transfers from all Austrian banks to credit institutions in CESEE decreased substantially over the past years. As chart 3.11 depicts, transfers have more than halved since 2011 and stood at EUR 18 billion at end-2018. Bucking the general declining trend, transfers to the Czech Republic have skyrocketed in recent years (because of the positive interest rate differential vis-à-vis the euro area). In 2018, they accounted for two-thirds of all transfers, although the affected subsidiaries' refinancing position has typically been strong.

Box 4

The Austrian Financial Market Stability Board at five

Five years ago, the Financial Market Stability Board (FMSB) was established to strengthen cooperation in macroprudential supervision and to promote financial market stability.¹³ Since then, the FMSB has contributed successfully to the reduction and mitigation of systemic risks identified by the OeNB in its monitoring activities. Since mid-2018, the Austrian banking sector has been ranked among the world's most stable banking systems.¹⁴ Consequently, Austrian banks and the Austrian economy have been benefiting from lower funding costs. Also, a recent analysis concluded that in Austria, the benefits of macroprudential measures have outweighed their costs.¹⁵

A strong national macroprudential framework is crucial. Unlike in microprudential supervision, the ECB has only "top-up" powers in macroprudential supervision under the SSM; this means that the ECB can apply more stringent macroprudential measures in case of potential national inaction. So far, the ECB has never made use of these powers. Also, the European Systemic Risk Board (ESRB) monitors and assesses systemic risks in the entire EU financial system and can issue warnings and recommendations.

Under the national macroprudential framework, the OeNB has been entrusted with the mandate of safeguarding the stability of the Austrian financial system. In carrying out this mandate, the OeNB is responsible for identifying and assessing systemic risks in the Austrian financial sector as well as for preparing the FMSB's recommendations and risk warnings. Furthermore, it also manages the FMSB's secretariat, which is responsible for procedural matters and prepares the FMSB's meetings. Finally, the OeNB provides expert opinions to the Austrian Financial Market Authority (FMA) to underpin the latter's legal measures.

The FMSB connects the key players in the Austrian supervisory framework. The FMSB links the OeNB's macroprudential monitoring with the FMA's supervisory function, based on the regulatory framework defined by the Federal Ministry of Finance. In addition, the Fiscal Advisory Council is actively involved in the FMSB to ensure that the sustainability of public finances is also taken into due account. Bringing together members of these four institutions, the FMSB convenes at least four times a year.

The OeNB has provided the input for important macroprudential measures taken by the FMSB. Since its inaugural meeting in September 2014, the FMSB has released 24 recommendations to the FMA, one advice to the Ministry of Finance and several communications on standards for sustainable mortgage lending, including their quantification, thereby making a significant contribution to maintaining financial stability in Austria. In particular, the implementation of the systemic risk buffer (SyRB)¹⁶ and the other systemically important

¹³ www.fmsg.at/en

¹⁴ Standard & Poor's Banking Industry Country Risk Assessment (BICRA).

¹⁵ For details see Posch, M., S. Schmitz and P. Strobl. 2018. Strengthening the euro area by addressing flawed incentives in the financial system. In: *Monetary Policy and the Economy Q2/18*. OeNB. 34–50.

¹⁶ The SyRB addresses the risks to individual banks that arise in the financial system because of its intrinsic mechanisms of risk sharing.

institutions (O-SII) buffer¹⁷ were adequate measures to contain direct and indirect risk concentration, to prevent moral hazard and increase the financial system's resilience. More recently, the FMSB published a quantification of sustainable lending standards to prevent the buildup of systemic risks stemming from banks leaning toward easing their lending standards for real estate loans.

Macroprudential policy in Austria is guided by high standards of transparency, accountability and consistency. *The FMSB publishes all its recommendations and press releases after each meeting on its website. It pursues its activities on the basis of a strategy that is also geared at fostering the decision-making process and communication and at demonstrating its accountability to the public. To ensure consistency, the OeNB takes into account the different aspects of systemic risk mitigation – macroprudential policy, the deposit guarantee schemes and the resolution regime – when preparing the FMSB's decisions.*

The FMSB will continue to play a key part in safeguarding financial stability in Austria. *It stands ready to respond swiftly to increases in systemic risks and to employ all its available tools to preserve financial stability in Austria and to contribute to financial stability in the EU.*

The OeNB's approach to macroprudential policy

The OeNB's approach to macroprudential supervision emphasizes consistency between crisis prevention and crisis resolution. An efficient framework has to ensure consistency between macroprudential regulation, the resolution regime and deposit guarantee schemes (DGSs). For regulators, the interplay of measures in these areas is essential. Hence, the OeNB's approach fundamentally contributes to strengthening financial stability in Austria.

Macroprudential buffers have been put in place in Austria. Since 2016, the systemic risk buffer (SyRB) and the other systemically important institutions (O-SII) buffer have been activated for selected Austrian banks.¹⁸ The SyRB addresses the systemic risk resulting from stress in the system for individual banks. It enables banks to absorb the repercussions of problems at individual banks which may arise from the risk-sharing mechanisms in financial systems such as deposit guarantee schemes or interbank exposures.¹⁹ For this reason, the calibration of the SyRB explicitly considers the two risk channels of funding cost shocks due to stress at an Austrian bank and costs emanating from a DGS event. The SyRB works as a corrective buffer to reduce negative effects by providing for a higher risk-bearing capacity. As a preventive buffer, the O-SII reduces structural risks within the financial system. The O-SII aims at making systemic events less probable by requiring systemically important banks to hold more capital.

¹⁷ *The O-SII buffer addresses the systemic risks to the financial system that arise from the potential failure of an individual bank via direct and indirect contagion.*

¹⁸ <https://www.fmsg.at/en/publications/warnings-and-recommendations/2018/recommendation-fmsg-2-2018.html> and <https://www.fmsg.at/en/publications/warnings-and-recommendations/2018/recommendation-fmsg-3-2018.html>

¹⁹ *The most important sources of systemic risks for the Austrian banking system are the still substantial exposures to emerging markets in Europe, weak structural profitability and banks' specific ownership structures, which do not ensure the adequate recapitalization of banks in the event of a crisis. Moreover, banks continue to be exposed to systemic risks, above all stemming from the risk-sharing mechanism in the financial system and from reputation effects (spread risk).*

Banks whose failure might have significant negative effects on financial stability are identified during resolution planning conducted by the national resolution authority.²⁰ The OeNB's consistent approach ensures that those banks are also identified as O-SIIs. Banks that are not considered O-SIIs can usually exit the market through regular insolvency proceedings, with the DGS effectively protecting savers' deposits. Austria has implemented the EU Directive on DGS²¹ and also has in place a sound and strict supervisory system. In spite of this, the failure of a large bank that would require DGS payouts could have a substantial impact on financial stability. Thus, the OeNB has extended its framework for identifying O-SIIs in line with the relevant EBA guidelines. This approach includes the application of the EBA indicators relating to banks' size, importance for the economy, cross-border activities and interconnectedness. Furthermore, national supervisors draw on their expertise regarding the domestic banking sector to identify further institutions that are so relevant that they should be designated as O-SIIs. In this process, the OeNB considers the findings from resolution planning and the assessment of the DGS. Therefore, banks with a share higher than 3.5% of guaranteed deposits are identified as highly relevant for the entire system because their failure would (over)burden the DGS; this is why they are classified as O-SIIs. In contrast to the SyRB, the O-SII buffer reflects the risk of the bank to the entire system and aims at reducing the probability of a large bank's failure. Hence, the O-SII buffer reduces the likelihood that large DGS events happen at all, while the SyRB ensures that if a DGS event happens, banks will be able to handle it.

Macroprudential policy reduces the probability of public bailouts. The OeNB's macroprudential policy combines a preventive approach (O-SII buffer) with a risk-mitigating approach (SyRB). This ensures the availability of a number of options to manage future banking problems without public bailouts. In addition, the combined approach intends to strengthen the shock absorption capacity of large banking groups and banking sector institutional protection schemes (IPSs). Since banks may be systemically relevant both at the consolidated and at the unconsolidated level, the SyRB and the O-SII buffer are implemented on both the consolidated and unconsolidated level.

Macroprudential buffers have a positive impact on the Austrian banking sector. Recent SyRB and O-SII buffer evaluations show that the activation of the buffers has yielded the intended effects. (1) Austrian banks have improved their capitalization (without scaling back lending) and (2) have made adjustments in their foreign business, which carried relatively high risks. This has led to (3) a decrease in the overall size of the Austrian banking sector. Against this background, the rating agency Standard & Poor's raised the rating of the Austrian banking system in May 2018, which puts it among the most stable banking systems worldwide.

The countercyclical capital buffer (CCyB) remains at 0%. The FMSB's recommendation to the FMA to leave the CCyB at 0% from July 1, 2019, was based on the finding that the main indicator – the credit-to-GDP gap – is negative and therefore does not show excess credit growth in Austria (see chart 3.12). In

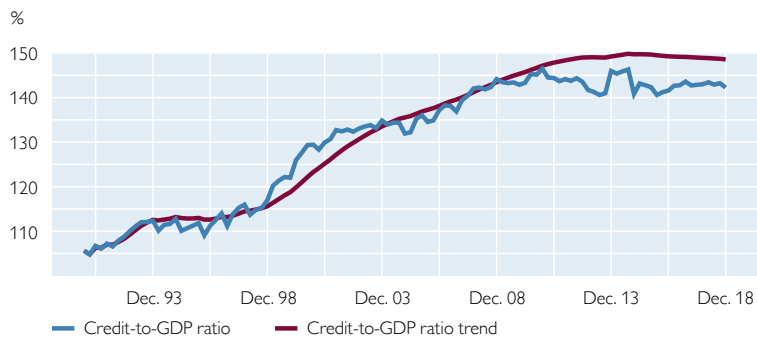
²⁰ See also Eidenberger, J., V. Redak and E. Ubl. 2019. *Who puts our financial system at risk? A methodological approach to identify banks with potential significant negative effects on financial stability.* In: *Financial Stability Report 37.* OeNB.

²¹ Directive 2014/49/EU.

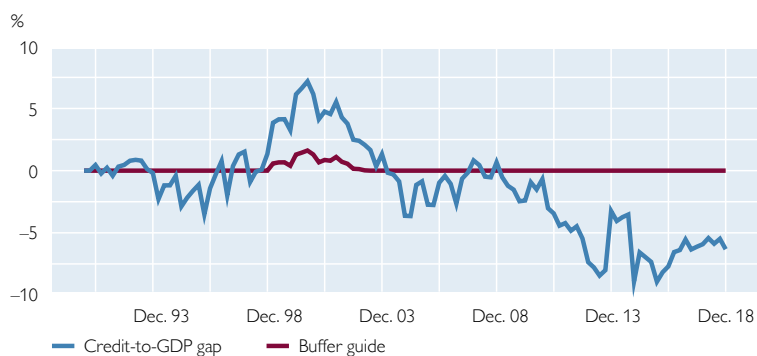
Chart 3.12

Indicators related to the countercyclical capital buffer

Credit-to-GDP ratio and trend



Credit-to-GDP gap and CCyB guide



Source: OeNB.

Note: The credit-to-GDP gap (blue line, bottom panel) is defined as the difference between the credit-to-GDP ratio (blue line, top panel) and its trend (purple line, top panel). A positive gap indicates that the current credit-to-GDP ratio is higher than its trend, which, according to the methodology proposed by the Basel Committee on Banking Supervision, indicates excessive credit growth.

In addition to this indicator, the OeNB's assessment of a set of eleven variables within six risk categories feeds into the CCyB decision. These variables include banks' interest margins, a high-yield bond spread, the leverage ratio, risk-weighted assets for corporate and mortgage loans, debt-to-income ratios for households and corporates, the price-to-rent ratio and the OeNB's fundamentals indicator for property prices, and the current account balance.²² Finally, the Austrian Financial Stress Indicator is also taken into account.²³ Currently, the FMSB considers the level of cyclical systemic risks stemming from excessive credit growth in Austria to be relatively low. However, some variables in the residential real estate sector warrant close monitoring with a view to the emergence of potential systemic risks.

Several European countries have put in place, or are discussing, positive countercyclical capital buffers. The most important among them, from an Austrian perspective, are France, Germany, the Czech Republic and Slovakia. France introduced a CCyB of 0.25% to be applied from July 1, 2019. This is in accordance with the

Basel methodology based on the credit-to-GDP gap, which indicates a positive CCyB for France. However, the main argument was the high degree of private sector debt recorded in 2018. In Germany, the competent authorities are discussing an increase of the CCyB above 0%, having identified three vulnerabilities: (1) an underestimation of credit risk by low risk weights, (2) an overvaluation of collateral values due to increased real estate prices and (3) high interest rate risk. Given that the German market is very similar to the Austrian market, the OeNB has been looking into whether these findings are also relevant for the domestic market. The OeNB found that, first, risk weights are considered to be higher in Austria than in Germany,²⁴ and their change over time enters the set of additional indicators for determining a CCyB rate in Austria. Second, higher real estate prices are a concern for financial stability in Austria too, but supervisory efforts have

²² See Sigmund, M. and I. Stein. 2017. What predicts Financial (In)Stability? A Bayesian Approach. In: *Credit and Capital Markets Vol. 3*. 299–336.

²³ See Eidenberger, J., B. Neudorfer, M. Sigmund and I. Stein. 2013. Quantifying Financial Stability in Austria – New Tools for Macroprudential Supervision. In: *Financial Stability Report 26*. OeNB. 62–81.

²⁴ See Döme, S. and S. Kerbl. 2017. Comparability of Basel risk weights in the EU banking sector. In: *Financial Stability Report 34*. OeNB. 68–89.

been made to limit the resulting vulnerabilities. Third, a close examination of interest rate risk²⁵ presented as a special topic in this report finds elevated interest rate risks for Austrian banks. While not yet at a level that would be critical from a systemic perspective, its increasing trend warrants further monitoring. In the Czech Republic, a 1% CCyB was introduced in July 2018, which will be raised to 1.5% from July 2019, mainly because of the high risks in the mortgage loan sector, according to the central bank. In Slovakia, a rate of 1.5% will be applicable starting in August 2019, with the general credit expansion, which is also visible in the credit-to-GDP gap, being quoted as the main reason.

Housing loans continue to be under close supervisory monitoring

The growth of housing loans by Austrian banks to households has remained strong, as real estate prices have been increasing further. The annual growth rate of residential real estate prices reached 7.4% in 2018 and remained strong also in the first quarter of 2019 (see chapter on corporate and household sectors in Austria). While lending for house purchases has grown more strongly than overall banks' balance sheets, its share still accounted for only 14% of Austrian banks' total balance sheet, which is below the EU average of 19%.

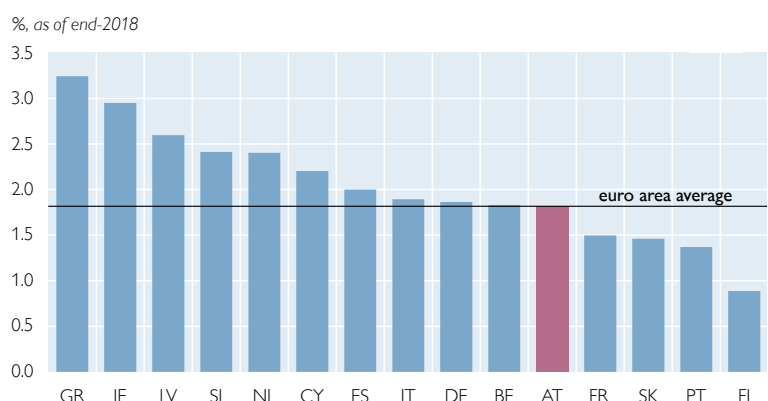
Nonperforming mortgage loan ratios have remained low. At the end of 2018, the NPL ratio for loans collateralized by residential real estate was 1.6% and, therefore, lower than for other types of loans to nonbanks. However, since NPL ratios are backward-looking indicators, they are suited for monitoring a buildup of systemic risks only to a limited extent.

The interest rates on new housing loans in Austria and in the euro area have continued to decline. Having dropped below 2% already in 2016, they averaged only 1.8% both in Austria and the euro area as of end-2018 (see chart 3.13). Over the last years, the initial fixed interest period for housing loans has increased markedly. For example, loans with rates fixed for more than ten years made up one-third of all new housing loans in 2018; until the beginning of 2016, this share had been below 10%. Still, loans with variable interest rates accounted for 44% of all new housing loans in Austria in 2018.

The OeNB calls on Austrian banks to comply with the guidance on sustainable real estate lending issued by the FMSB in September 2018.²⁶ Preliminary evidence from an OeNB survey is encouraging, confirming banks' efforts to reach more sustainable loan-to-value

Chart 3.13

Interest rates on new housing loans



Source: ECB.

²⁵ Kerbl S., B. Simunovic and A. Wolf. 2019. Quantifying interest rate risk and the effect of model assumptions behind sight deposits. In: *Financial Stability Report 37*. OeNB.

²⁶ Press release of the 17th meeting of the Financial Market Stability Board, September 2018. <https://www.fmsg.at/en/publications/press-releases/2018/17th-meeting.html>

ratios and maturities. Nevertheless, the OeNB is concerned about the comparatively high share of new mortgage loans with loan-to-value ratios above 100%, for which borrowers did not provide an adequate deposit, and about rising debt service levels in relation to borrowers' income.

The OeNB aims at preventing the strong momentum in the Austrian real estate market from fueling a credit-price spiral. The potential for a credit-price spiral has increased against the backdrop of continuously rising real estate prices and increasing loan volumes granted at lending standards that are not in line with the FMSB's guidance on sustainable debt service ratios. At the same time, however, some mitigating factors are still at work: a relatively low level of household indebtedness, a rising share of loans with longer interest rate fixation periods, and the above-mentioned relatively low level of mortgages in relation to bank capital.

The OeNB will continue to closely monitor systemic risk from real estate lending. An analysis of lending standards over time shows that new mortgage lending with conservative risk indicators has been on the decline, while potential risks have been slowly building up. In line with its financial stability mandate, the OeNB will carefully evaluate whether these developments warrant an activation of macroprudential instruments as laid down in Article 22b Austrian Banking Act. A key aspect in this regard will be the assessment of the effectiveness of the FMSB's quantitative guidance on sustainable real estate lending.

New leaflet about risks of foreign currency loans

Foreign currency lending has continued to decline sharply in Austria. The volume of outstanding foreign currency loans to domestic nonbanks fell by 11% (exchange rate adjusted) to EUR 20.6 billion in 2018. As a result, the share of foreign currency loans in total loans dropped to 5.7%. Given the substantial decrease seen over the past few years, foreign currency loans do not represent a systemic risk for the Austrian financial system. Yet, the risks for household borrowers remain high, since about three-quarters of foreign currency loans to households are bullet loans linked to repayment vehicles. The OeNB, in cooperation with the FMA, conducts an annual survey among a representative sample of Austrian banks to ensure the ongoing monitoring of outstanding foreign currency loans, especially those linked to repayment vehicles. The 2019 survey results showed that at the end of 2018, the shortfall between the outstanding loan amount in euro and the forecast value of the repayment vehicle upon maturity had equaled around 30% of outstanding repayment vehicle loans, or EUR 4.2 billion.

A new information leaflet on foreign currency loans informs borrowers about related risks. It has been published on the joint initiative of the OeNB, the FMA and the Austrian Economic Chambers with the aim of further increasing borrowers' awareness of the risks emanating from foreign currency loans.²⁷ The leaflet is available at bank branches across Austria. In addition to providing a concise overview of the relevant risks, it puts a focus on banks' information

²⁷ For more details on the new information leaflet on foreign currency loans, see https://www.oenb.at/dam/jcr:5f7c71f7f-b0ee-49b9-9c0d-ae35eaa221d0/folder_fremdwahrungskredite_01_2019.pdf (available in German only).

obligations toward borrowers, which were substantially expanded in the revised FMA Minimum Standards published in 2017.²⁸

The amount of foreign currency loans issued by Austrian banks' CESEE subsidiaries has also continued to decline. The volume of outstanding foreign currency loans to households and nonfinancial corporations fell by 5% (exchange rate adjusted) to EUR 29.8 billion in 2018, and the share of foreign currency loans in total loans came down from 27% to 25%. The euro is the most important loan currency by far, accounting for about 80% of all foreign currency loans. Loans in Swiss francs and U.S. dollars account for around 10% each. Apart from this ongoing downward trend, there are political uncertainties about legislative initiatives regarding foreign currency loans in several countries (e.g. Poland) which could increase the financial burdens on Austrian banks operating in CESEE.

The quality of foreign currency loans has improved but is still weaker than that of local currency loans. The NPL ratio of foreign currency loans issued by Austrian banks' CESEE subsidiaries has declined continuously over the past three years. Still, foreign currency loans continue to be of weaker credit quality than local currency loans. As of end-2018, the NPL ratio for foreign currency loans stood at 6.4% (down from 8.5% a year before), while the ratio for local currency loans was 3.9%. The associated risk has been partly mitigated by high risk provisioning, with the NPL coverage ratio standing at almost 66% for both loan portfolios. Broken down by currency, the strongest decrease of the NPL ratio can be observed for U.S. dollar-denominated loans, whose NPL ratio came down from 11.2% to 5.7% in 2018. This strong reduction was mainly due to NPL sales in Romania, Ukraine and Russia. The NPL ratio of euro- and Swiss franc-denominated loans stood at 6.4% and 7.4%, respectively.

Box.5

Strengthening cyber resilience in financial market infrastructures

In December 2018, the ECB published cyber resilience oversight expectations (CROEs). This new framework for oversight activities is based on the global guidance for financial market infrastructures published in 2016 by the Committee on Payments and Market Infrastructures and the Board of the International Organization of Securities Commissions (CPMI-IOSCO). The CROEs provide supervisors and financial market infrastructures with a benchmark against which they can evaluate the current level of cyber resilience, measure progression and identify areas for further improvement. The OeNB's oversight function will apply the CROEs in addition to the CPMI-IOSCO Principles for Financial Market Infrastructures. In Austria, substantial improvements in the field of cyber resilience have already been achieved for selected addressees, which include national payment systems as well as central counterparties and central securities depositories.

Another current oversight focus lies on the implications of the revised European Payment Services Directive (PSD2). The PSD2, which was transposed into Austrian law in 2018, aims at enabling innovation and setting higher security standards

²⁸ For more details on the revised "FMA Minimum Standards for the Risk Management and Granting of Foreign Currency Loans and Loans with Repayment Vehicles", see <https://www.fma.gv.at/download.php?d=2885>.

for payment services. National payment service providers are currently working on the development of mutually compatible interfaces in order to fulfil the requirements of common and secure communication (set by the respective regulatory technical standard, which will be applicable from September 2019).

Prolonged period of low yields is a challenge for the life insurance sector

Persistently low yields and the risk of a sudden interest rate rise are still posing challenges to the insurance sector, and life insurance companies in particular. As a result, life insurance premiums have decreased sharply by 25% since their all-time high in 2010 (from EUR 7.4 billion to EUR 5.5 billion). Given that the maximum guaranteed rate on a traditional life insurance policy is unchanged at 0.5%, some life insurers continue to adapt by shifting their business mix toward products that are directly linked to market performance and whose investment risk is borne by policyholders. These developments notwithstanding, the share of traditional life insurance contracts remains stable at about two-thirds of all life insurance premiums written.

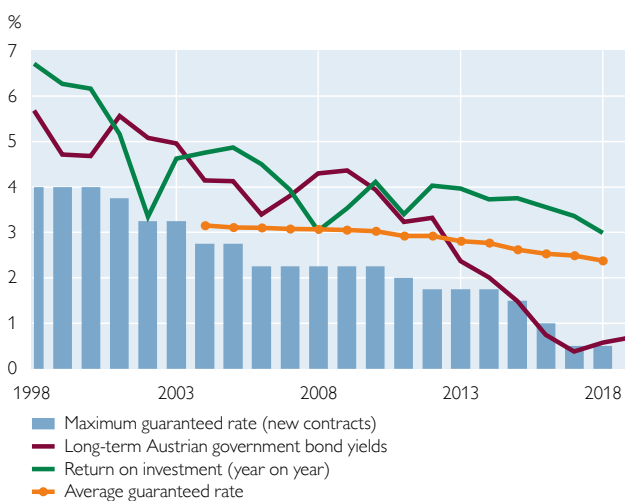
The profitability of the life insurance sector remains higher than the guaranteed rate on existing policies. The left-hand panel of chart 3.14 shows that despite the adversities the sector has been faced with, the investment return of Austrian life insurance companies is higher than the average guaranteed rate on the stock. The right-hand panel shows a similar result at the individual company level: for most life insurance companies, the return on their assets is still higher than the guaranteed rate of the stock.

At the same time, the results of the entire insurance sector slumped. The underwriting result fell by 13% in 2018, while the financial result fell by 10% to EUR 2.5 billion. This led to a decrease in the result from ordinary activities by 6%.

Chart 3.14

Return on Austrian life insurance companies' investments compared with important benchmarks

Return on investment and guaranteed rate



Rate of return and average guaranteed rate

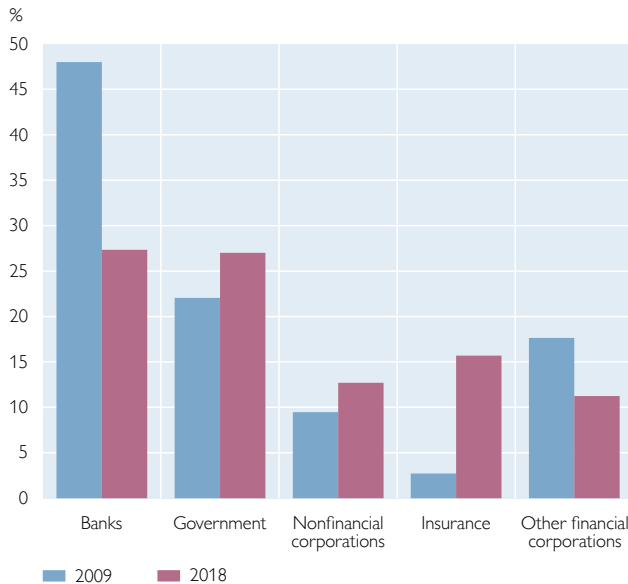


Source: FMA (Austrian Insurance Statistics).

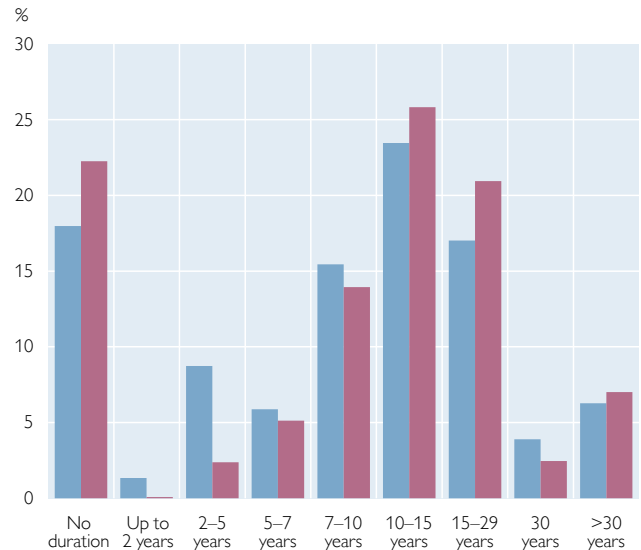
Chart 3.15

Considerable changes in Austrian insurance companies' investment behavior

Insurers' asset allocation in securities investments



Original maturity of insurers' investments in securities



Source: OeNB.

The Austrian insurance sector has been adjusting its investment behavior to the low interest rate environment and to regulatory changes, such as Solvency II. From 2009 to 2018, insurers significantly reduced their exposure to bank securities (by more than 20 percentage points), while increasing investments in government bonds by 5 percentage points (see the left-hand panel of chart 3.15). However, these developments are not homogeneous in the sector, where a small number of large insurance undertakings accounts for the majority of assets (the top five undertakings account for more than 70% of total assets). Over the past decade, there has also been a shift in securities' maturities from short (2 to 5 years) toward longer maturities (10 to 29 years). This was caused by Solvency II-induced capital requirements and efforts to address the duration gap between life insurers' liabilities and assets, which makes short-term securities particularly unattractive given the long duration of insurers' liabilities (see the right-hand panel of chart 3.15). The solvency capital ratio of Austrian insurance companies stands at a comfortable median of 255%, which is higher than the ratio of most of its European peers.²⁹

²⁹ EIOPA *Financial Stability Report December 2018* p. 30, <https://eiopa.europa.eu/Publications/Reports/EIOPA%20FSR%20December%202018.pdf>

Special topics

Nontechnical summaries in English

Who puts our financial system at risk? A methodological approach to identify banks with potential significant negative effects on financial stability

Judith Eidenberger, Vanessa Redak, Eva Ubl

As a consequence of the global financial crisis, an international framework of rules has been established with the aim of addressing the too-big-to-fail problem. In the past, banks had (too) often been classified as systemically important. In other words, it was considered too dangerous for the financial market and the real economy to let these banks go insolvent, and, therefore, taxpayers' money was used to rescue them.

To tackle this issue, rules governing the resolution of banks and macroprudential measures have been established. This study seeks to bring together the different sets of rules and to create uniform indicators for identifying systemically relevant banks. Furthermore, the current regulatory framework lacks a methodology for setting thresholds. The study addresses this issue by using, inter alia, the substitutability of bank services (e.g. lending, deposit taking) for calibrating thresholds. The degree to which other banks can substitute for the services that have been provided by a failing bank is key in determining whether a bank is systemically important or not.

Quantifying interest rate risk and the effect of model assumptions behind sight deposits

Stefan Kerbl, Boris Simunovic, Andreas Wolf

When interest rates rise, assets with a fixed interest rate lose in value. This risk potentially affects a large portion of a bank's balance sheet and thus requires risk management and quantification. We investigate whether Austrian banks' interest rate risk has increased in the past years, e.g. because banks have been supplying more fixed rate loans without refinancing themselves accordingly. Judging from the data reported by banks, we find that smaller banks increased their interest rate risk markedly since the onset of the low and negative interest rate period, while this trend is not visible for large banks. However, in measuring interest rate risk, banks need to rely on model assumptions, especially with regard to the repricing dates they assume for customer deposits. Sight deposits have no contractually agreed mechanism for interest rate changes and so banks use behavioral models to estimate until which time they need to pass on interest rate increases to ensure adequate refinancing. In this study, we calculate Austrian banks' interest rate risk, assuming, in addition, that depositors are highly sensitive to interest rate changes. We base our calculations on the assumption that if interest rates rose, banks would need to pass the rise on to the depositors or else risk losing their customers. This assumption is conservative but allows for a level playing field comparison. Under this level playing field assumption, we find that large banks have increased their interest rate risk substantially, and a few have reached particularly elevated levels. This trend is masked by the banks' own model assumptions concerning sight deposit outflows. We conclude that the yearly supervisory process should pay particular attention to interest rate risk and that this topic warrants broader, international analysis.

Nontechnical summaries in German

Welche Banken stellen ein Risiko für das Finanzsystem dar? Eine Methodologie für die Identifizierung von Banken, die signifikante negative Auswirkungen auf die Finanzstabilität haben könnten

Judith Eidenberger, Vanessa Redak, Eva Ubl

Eine Konsequenz der letzten Finanzkrise war die Schaffung eines internationalen Regelwerks mit dem Ziel, das „too big to fail“-Problem zu reduzieren. Denn (zu) oft wurde eine Bank als systemrelevant eingestuft – das heißt, eine mögliche Insolvenz dieser Bank galt als zu gefährlich für den Finanzmarkt und die Realwirtschaft –, und daher die Rettung der Bank mit öffentlichen Mitteln eingeleitet.

Regeln zur Abwicklung von Banken und makroprudenzielle Maßnahmen sollen diesem Phänomen entgegenwirken. Die vorliegende Studie zielt darauf ab, die verschiedenen Regelwerke zusammenzubringen und einheitliche Indikatoren zur Identifikation von systemrelevanten Banken festzulegen. In den aktuellen Regelwerken fehlt zudem eine Methodik, wie Schwellenwerte festgelegt werden sollen. Auch hier leistet die Studie einen wichtigen Beitrag. So wird zur Kalibrierung der Schwellenwerte u. a. die Substituierbarkeit der verschiedenen Leistungen (wie Kreditvergabe oder Einlagengeschäft) einer insolventen Bank durch andere Banken herangezogen; diese Frage bestimmt wesentlich, ob eine Bank systemrelevant ist oder nicht.

Quantifizierung des Zinsrisikos unter Berücksichtigung der Zinsbindungsmodellierung von täglich fälligen Einlagen

Stefan Kerbl, Boris Simunovic, Andreas Wolf

Steigen die Zinsen, verlieren Vermögenswerte mit fixer Zinsbindung an Wert. Da von diesem Zinsrisiko ein wesentlicher Anteil einer Bankbilanz betroffen sein kann, sind Risikomanagement und Risikomessung von essenzieller Bedeutung. In dieser Studie wird untersucht, ob sich das Zinsrisiko österreichischer Banken in den letzten Jahren erhöht hat, weil sie beispielsweise vermehrt festverzinsliche Darlehen angeboten haben, ohne für eine adäquate Refinanzierung zu sorgen. Von den Meldedaten der Banken lässt sich ablesen, dass kleinere Banken ihr Zinsrisiko seit dem Beginn der Niedrig- und Negativzinsperiode deutlich erhöht haben. Für Großbanken ist dieser Trend hingegen nicht ersichtlich. Allerdings unterstellen Banken ihrer Zinsrisikomessung Modellannahmen, insbesondere im Hinblick auf die Zinsbindungsfristen von Kundeneinlagen. Die Zinsbindung von täglich fälligen Einlagen ist nämlich nicht vertraglich geregelt. Deshalb schätzen Banken die Zinsbindung anhand fiktiver Zinsbindungsfristen. Dabei schätzen sie den Zeitpunkt, zu dem sie Zinssatzänderungen weitergeben müssen, um einen Abfluss der Gelder und somit einen kurzfristigen Refinanzierungsbedarf zu verhindern. In dieser Studie wird das Zinsrisiko österreichischer Banken unter der Annahme berechnet, dass Einleger höchst sensibel auf Zinssatzänderungen reagieren. Es wird davon ausgegangen, dass Banken steigende Zinsen unmittelbar an die Einleger weitergeben müssen, um ihre Kunden nicht zu verlieren. Diese Annahme ist zwar konservativ, ermöglicht aber einen Vergleich unter gleichen Wettbewerbsbedingungen. Diesen konservativen Modellierungsannahmen zufolge haben Großbanken ihr Zinsrisiko wesentlich gesteigert, wobei sich für einige Banken sogar besonders erhöhte Werte ergeben. Dieser Trend wird jedoch von den bankeigenen Modellannahmen über die Abnahme täglich fälliger Einlagen verdeckt. Im aufsichtlichen Prozess sollte daher besonderes Augenmerk auf das Zinsrisiko gerichtet werden, und das Thema sollte auf internationaler Ebene ausführlicher analysiert werden.

Who puts our financial system at risk?

A methodological approach to identify banks with potential significant negative effects on financial stability

“...man war schon ganz süchtig danach, dass irgendein nächstes Institut kurz vor dem finalen Exitus, dem Supercrash, dem totalen Endzusammenbruch stand, dann aber gerade noch, da es, wie es jetzt dauernd so selbstverständlich soziologisch hieß, systemrelevant war, vom Staat mit soundsovielen Hunderten von Millionen, bald Milliarden Dollars und Euro GERETTET werden musste...”¹

Rainald Goetz: *loslabern*, Suhrkamp 2009

Judith Eidenberger, Vanessa Redak, Eva Ubl²
Refereed by: Hannah Hempell, Martin Saldias, ECB

Since the outbreak of the global financial crisis, a number of regulations have been issued to cope with the too-big-to-fail problem and its devastating effects on financial markets, government budgets and the broader economy in general. The aim of these regulations is to contain the risks stemming from large institutions which potentially jeopardize not only these institutions' own existence but other institutions and segments of the economy as well. In particular, new legislation in macroprudential supervision and resolution that refers to systemically relevant institutions addresses the too-big-to-fail problem. Still, in practice, it is difficult for supervisory authorities to answer the question which institution may really compromise financial stability. The identification of systemically relevant banks is particularly important for banking systems (like the Austrian) with large numbers of banks, where even medium-sized banks might put stress on the entire financial system. Bringing together macroprudential regulations as well as recovery and resolution planning, this methodological paper aims to contribute to the literature and supervisory practice on the identification of systemically relevant banks. We develop a consistent and comprehensive framework that consists of more than 30 quantitative indicators reflecting four key stability criteria: financial market conditions, economic importance, direct contagion and indirect contagion. A particular challenge in this context is the setting of explicit thresholds for each of these indicators. To resolve this issue, we design a methodological approach to calibrating thresholds for different types of indicators: stress indicators, risk exposure indicators, system share indicators and network indicators. We identify thresholds based on quarterly panel data (from 1999 to 2016) for the Austrian banking sector. One basic assumption of our calibration is the idea of substitutability: If market activities of a failing bank can be absorbed promptly by other market participants, financial stability will not be at risk. As the substitution of bank activities also depends on the current phase of the economic cycle, we account for bust phases by developing stress scenarios.

JEL classification: G21, G18

Keywords: financial stability, macroprudential supervision, resolution, systemically important banks, thresholds

¹ “...there appeared to be an addictive desire to watch yet another bank facing its imminent demise, a super crash, a total and irreversible collapse, and then needing to be SAVED by the government, at the last minute, with hundreds of millions and soon billions of dollars or euro because it was systemically important, as was now habitually being pointed out to us in smooth sociology-speak...”

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One major lesson learned from the recent global financial crisis was that regulators and policymakers should pay greater attention to systemically important banks. The crisis revealed that some banks were too large and too interconnected, so that their failure (market exit) would have been risky for the financial system and the economy. Hence, public money was used to bail out troubled banks. To prevent taxpayers from paying for bank rescues in the future, various new regulations and instruments have been implemented at the European and national levels. In particular, the Banking Recovery and Resolution Directive was adopted in 2014 (BRRD, Directive 2014/59/EU). The BRRD provides a framework for authorities to manage bank failures and allow an orderly resolution without disrupting the financial system or the real economy. The BRRD was implemented in Austrian law through the Bank Recovery and Resolution Act (Bundesgesetz über die Sanierung und Abwicklung von Banken, BaSAG) and entered into force in 2015.

In addition, the macroprudential buffer regime – similar to resolution planning – has been established with the aim of ex ante identifying those banks whose failure might have significant negative effects on financial stability. Macroprudential capital buffers³ were introduced in the euro area to increase the resilience of systemically important banks. In this context, the Basel Committee on Banking Supervision (BCBS) published a methodology for identifying global systemically important banks in 2013.⁴ In addition, the Financial Stability Board (FSB) publishes annually a list of global systemically important banks (G-SIBs).⁵ At the national level, so-called other systemically important institutions (O-SII) need to be identified based on the European Banking Authority (EBA) Guidelines (EBA/GL/2014/10).⁶

Both the BRRD and the regulations on macroprudential capital buffers for systemically important banks (G-SIB and O-SII) aim at safeguarding financial stability by identifying in advance those banks which might put the financial system at risk. These regulations use similar terminology⁷ (e.g. financial stability and criticality) and list similar indicators, as for both purposes, a bank must be classified either as systemically important or not. This notwithstanding, what is still missing is a consistent definition of systemically important banks that takes into account macroprudential and resolution matters. A consistent identification of SIBs in different supervisory fields is also important to banks themselves, not least because this enables them to predict legal and supervisory decisions.

The framework developed in this paper attaches great importance to consistency between crisis prevention and crisis resolution. In practice, supervisors' degree of prudence differs not only between countries but also within countries (microprudential, macroprudential and resolution authorities). Some supervisors are more prudent and tend to be more risk averse as they do not want to overlook any potential risk source (including a risky bank). Hence, they have an incentive to ex ante identify

³ The European CRD IV and CRR came into force in January 2014. Macroprudential buffers are defined in Articles 130, 131, 133 CRD IV. The buffer regime was implemented in national law, for Austria in the Austrian Banking Act (BWG, Bankwesengesetz).

⁴ Basel Committee on Banking Supervision (2013).

⁵ <http://www.fsb.org/2018/11/fsb-publishes-2018-g-sib-list/>

⁶ <https://eba.europa.eu/documents/10180/930752/EBA-GL-2014-10+%28Guidelines+on+O-SIIs+Assessment%29.pdf/964fa8c7-6f7c-431a-8c34-82d42d112d91>

⁷ Unfortunately, the BRRD provides no definition of the term “financial stability.”

more banks as systemically important. Others want to work with a narrow definition of systemically important banks, also for reasons of proportionality.

Another drawback of the existing framework is that it includes guidelines on indicators, but no explicit thresholds for the individual indicators (O-SII thresholds are determined implicitly⁸). This leads to divergent national supervisory practices and limits regulatory harmonization and comparability between EU Member States. Even at the national level, macroprudential and resolution authorities may choose different thresholds for the same indicators.

Furthermore, the current regulations and guidelines do not even contain any methodological suggestions on how to calibrate these thresholds. Therefore, supervisors run a risk of setting inconsistent thresholds and facing legal action. We contribute to the literature and supervisory practice by putting these indicators in a comprehensive framework and – this is a novelty – show a methodological approach to how these thresholds can be calibrated.

In the literature, different approaches to define thresholds can be found: for example, thresholds based on multivariate quantiles (e.g. Serfling, 2002), thresholds based on historical distribution (e.g. Venditti et al., 2018) and bubble detection based on time series analysis (e.g. Diba and Grossman, 1988; Astill et al., 2018). We follow the historical distribution approach.

By establishing a both consistent and comprehensive framework and by presenting a methodological approach for a reliable threshold definition, we provide supervisory advice on how to assess the systemic importance of banks. We suggest a potential list of indicators and thresholds and present a methodology that can be applied specifically to individual countries. For countries with a small or concentrated banking system, the identification of systemically important banks may be more intuitive. However, for countries with a large banking sector, like Austria (which has more than 600 banks), a sound methodology is of high relevance.

The rest of the paper is organized as follows: In section 2 we present general considerations of an ex ante assessment framework. In section 3 we elaborate more specifically on the framework to identify Austrian banks with potential significant negative effects on financial stability. Here we integrate the entire set of indicators into a comprehensive framework, and – as a major contribution – we reveal the methodology for calibrating thresholds for selected indicators. In section 4 we conclude.

1 General considerations of an ex ante assessment framework

One of the key questions for supervisors is which banks' market failure and resulting market exit would jeopardize financial stability. Financial stability is defined as a financial system being “capable of ensuring the efficient allocation of financial resources and fulfilling its key macroeconomic functions even if financial imbalances and shocks occur.”⁹ A significant negative impact on financial stability can arise if the core function of banks (risk allocation and financial intermediation) is disrupted. It is important to distinguish between a considerable impact on financial stability and large economic losses on the one hand and minor market disruptions

⁸ The systemic importance of each bank is assessed by scoring the four indicators size, complexity, relevance for the economy and interconnectedness. The relative share of the bank within the financial system equals the score for the indicator. Banks with an average score above 350 basis points are classified as O-SII.

⁹ OeNB definition, see <https://www.oenb.at/en/financial-market/financial-stability.html>

or negative spillovers to some market participants on the other hand. The latter are part of the natural workings of the financial system and the economic cycle and are not intended to be avoided.

The ex ante identification of banks with potential significant negative effects on financial stability is the basis for a detailed analysis when a specific event of a likely failure occurs. Faced with the imminent threat of a bank's failure, authorities will assess the effects of the bank's market exit or resolution in more depth, using more detailed and very recent data (partly provided by the bank itself).

A key aspect in our methodology is substitutability. We argue that if a bank can exit the market suddenly without causing turmoil because other financial institutions step in to provide this bank's services (such as payment services, granting loans, taking in deposits, acting as derivative counterparts, etc.), financial stability is not at risk. More specifically, we assess substitutability by comparing the volume of services provided by each bank with the average historical market changes of the aggregated volume. For example, we assess the substitutability of new loans, as it is essential that a bank's market exit does not cause a credit supply shock that may threaten financial stability.

One major challenge of this ex ante assessment framework is the uncertainty about the future market environment. The specific stage of the economic and financial cycle strongly influences a bank failure's consequences for the economy and the financial system. In a boom phase, the economy and the financial system are less vulnerable, and a bank failure is more likely to be absorbed by other market participants without strong negative effects on financial stability. Yet the market's capacity to substitute for the business of a failing bank might be lower in periods of stress in the financial markets. In an already tense market environment, the failure of a bank might put the broader economy at risk, while the same market exit would have no drastic effects in a prospering environment.

We consider two methodological options to capture lower substitutability during stress periods: threshold calibration based on historical stress periods and scenario analysis. The first option follows an approach similar to that for the overall threshold calibration but considers only stress periods. We opt for the scenario analysis, because only a limited number of observations for stress periods are available in Austria. Furthermore, statistical measures (like standard deviations) are less significant for volatile stress periods, making threshold calibrations less reliable.¹⁰

Hence, we suggest considering different economic scenarios suitable for a specific country when setting thresholds. These scenarios need to reflect the characteristics and the relevant vulnerabilities of the banking system and the wider economy. The starting point is a baseline scenario based on average market conditions. This view can be complemented by country-specific severe, but plausible, scenarios. Austria has a large banking sector, which is highly interconnected with Central, Eastern and Southeastern European (CESEE) countries, therefore we calibrate thresholds for scenarios such as "macroeconomic downturn in CESEE with negative implications for the Austrian banking sector." Other scenarios for Austria are "stress in the real estate market" and "tense market after a bank failure triggered a deposit insurance payout."

¹⁰ Because of the limited number of observations within stress periods, statistical measures are less reliable.

2 A framework to identify Austrian banks with potential significant negative effects on financial stability

2.1 Indicators

The starting point for the assessment framework is the synopsis of three frameworks: first, the internal assessments used by the OeNB to evaluate the systemic relevance of banks; second, indicators introduced by the Single Resolution Board (SRB) to identify banks whose failure is likely to result in “significant adverse effects on financial stability;” and third, indicators listed by the EBA to assess institutions that are more likely than others to create risks to financial stability due to their systemic importance. Based on this framework, we set up four main criteria (financial market conditions, economic importance, direct contagion and indirect contagion) and a total of ten subcriteria. Table 1 gives an overview of all criteria and subcriteria.

The indicators must meet several consistency tests to be included in the framework: They need to be economically relevant, quantifiable and consistent over different regulatory guidelines. Bringing together macroprudential and resolution regulations, we come up with an overall list of more than 30 indicators to assess potential financial stability effects caused by Austrian banks (see annex).

The first main criterion evaluates the current *financial market conditions* in Austria and the euro area. They are captured using the Austrian Financial Stress Index (AFSI)¹¹ for Austria and the Composite Indicator of Systemic Stress (CISS) for the euro area. These two indicators are based on data from relevant stock, money and bond markets and reflect current financial market risks. An increase denotes an increase in instability. *Ceteris paribus*, the more stable financial market conditions are, the smaller the negative effects of a given insolvency on financial stability and the real economy will be.

The stress indices have an inversely proportional effect on the thresholds of indicators used for all other criteria. This means that the higher the stress indices are, the lower the thresholds for the remaining indicators will have to be set.

Table 1

Overview of criteria and subcriteria to assess banks with potential significant negative effects on financial stability

Main criteria	Financial market conditions	Economic importance	Direct contagion	Indirect contagion
Subcriteria	Financial market conditions indicators	Size	Network indicator	Common exposure
		Significance		Risks stemming from covered deposits
		Nature and amount of liabilities	Type, complexity, amount and composition of risk	Risk density
		Nature and amount of cross-border business		

Source: Authors' compilation.

¹¹ For a detailed explanation of the indicators and their calculation, see Eidenberger et al. (2013).

The second criterion assesses the *economic importance* of the bank in question. We apply four subcriteria: First, the *size* of the credit institution in relation to the Austrian banking sector as a whole provides information about the gap in the Austrian banking system that will have to be closed by other banks if this credit institution fails. This gap is approximated by the relevant institution's share of the Austrian banking sector's total assets.

The second subcriterion reflects the bank's *significance to the real economy*. It measures the bank's significance for supplying banking services, which provides information about the potential effects of its insolvency on the real economy. Market share is used as a proxy for importance, and the number of individual services is used for the time needed to substitute for the service. Indicators for such bank services are the volume of private sector deposits and loans as well as the volume of domestic payments, the number of depositors, the number of lenders, and the number of payment transactions.

The third subcriterion is the *nature and amount of the credit institution's liabilities to other credit institutions and to other financial institutions*. This criterion provides information about the financial importance of the institution as well as its interlinkages with other institutions and therefore gives some indication of direct contagion. Suitable indicators are the share of interbank liabilities and claims and the share of outstanding debt and equity securities.

The fourth subcriterion – *nature and amount of a credit institution's cross-border business* – is relevant because cross-border business makes insolvency proceedings significantly more complex, which may, in turn, give rise to significant negative effects on financial stability and on the real economy. Furthermore, cross-border effects should be reduced to avoid negative spillovers or contagion risks.¹² Cross-border effects are estimated by using the volume of cross-border claims and liabilities and the share of cross-border business in aggregated total assets of the Austrian banking system.

The third main criterion focuses on the *direct contagion* channels of the institution to counterparties both in Austria and abroad, particularly within the EU. Direct contagion describes a situation where the direct losses caused by a bank's insolvency or resolution have negative effects on the entire financial system. Such negative effects may include the default or likely default of the counterparties or a significant impact on their ability to perform their macroeconomic functions efficiently for an extended period.

To assess the criterion of direct contagion, we use *network indicators* to measure the interconnectedness of a bank with other institutions and with foreign countries. We study its relative importance for the interbank market to measure the amount of direct contagion risk. As a first subcriterion, we use a set of network metrics including debt rank, Katz centrality and eigenvector centrality.¹³ These indicators are calculated based on Austrian central credit register data.

¹² The BaSAG states that Austrian authorities need to consider potential negative effects in other Member States for all resolution (planning) decisions.

¹³ In network analysis, indicators of centrality identify the most important vertices within a graph. Examples are betweenness centrality, closeness centrality, eigenvector centrality, node strength centrality, degree centrality, harmonic centrality and Katz centrality. These measures identify the most influential actor in a network. Centrality concepts were developed in network analysis to identify the degree of connectivity of each participant of the network. We use an exposure-weighted directed network. For the network of Austrian banks with other countries, we use inverse Katz centrality because it is stable regarding changes and also reflects the vulnerability of banks which are connected with the most important nodes.

The subcriterion *type, complexity, amount and composition of risk* identifies institutions with higher contagion risk. *Complexity of business* is considered because the valuation of complex businesses is particularly difficult in the event of a crisis. As there is no uniform definition of complexity, we focus on complex financial instruments. The recent financial crisis has shown that complex instruments are sources of substantial risk and that some banks suffered high losses or even went insolvent because of complex instruments. The last crisis experience has also shown that in times of stress, banks sell complex instruments first. Complexity of business is measured by the volume of derivatives and OTC derivatives and the share of OTC derivatives in a bank's total assets. Complexity can also stem from complex ownership structures or complex equity interests such as special purpose vehicles.¹⁴

Indirect contagion (the fourth main criterion) occurs when banks' actions generate externalities that affect other institutions through noncontractual channels.¹⁵ Through this contagion channel, the insolvency of an institution may cause a negative reaction from other market participants that leads to a severe disruption of the financial system with the potential to harm the real economy. Indirect contagion is assessed by three subcriteria: common exposure, risk from covered deposits and risk density.

To assess *common exposure*, we divide the balance sheet (assets and liabilities) of each bank into nine main items. On the asset side, we identify interbank loans, securities held, mortgage loans, SME loans, consumer loans and cross-border business. On the liability side, we identify interbank deposits, other deposits and securities issued. The common exposure criterion clusters the banks along these main balance sheet items. This clustering reveals which banks are indirectly connected via common exposures or similar business models. Indirect contagion can only be a threat to financial stability if caused by the failure of banks which are significant for the system because of their size.¹⁶ Cont and Schaaning (2018) have shown that effects of indirect contagion are more relevant for large banks than for smaller banks.¹⁷

Another subcriterion for indirect contagion is *risks from covered deposits*. Even though the EU Directive on deposit guarantee schemes (Directive 2014/49/EU) has been transposed into Austrian law and supervision in Austria is sound and strict, a deposit guarantee scheme payout event triggered by a bank with a high volume of covered deposits would be very costly for the banking system. Covered deposits are a main channel for indirect contagion due to the risk-sharing framework of the deposit guarantee system. If a failed bank's covered deposits exceed the amount of ex ante funds in the deposit guarantee scheme, all other banks have to contribute: first, by providing ex post funds, second, by refilling the ex ante funds, and third, by providing a loan to the deposit guarantee scheme. If a bank's ratio of covered deposits to total assets is high, the probability that insolvency proceeds will cover all expenses and completely compensate for funds provided by the banking sector is smaller. Hence, this bank's insolvency will weaken the entire banking sector. We

¹⁴ Finally, all banks identified under this subcriterion are not allowed to apply the exemption for small trading book business in line with Article 94 CRR.

¹⁵ In contrast to direct contagion, which occurs via contractual channels, e.g. loan contracts or derivatives contracts, indirect contagion channels show spillover via noncontractual channels, e.g. common exposure or similar business model.

¹⁶ Depending on the indicator, it can be the market share of the bank measured by total assets or measured by the specific risk category.

¹⁷ This paper does not address the issue of indirect contagion via "too many to fail" (simultaneous failure of many small banks).

use a bank's share in total covered deposits in Austria and the ratio of covered deposits to total assets for each bank as indicators for this subcriterion.

The third subcriterion is the *risk density* for each bank, which is estimated as risk-weighted assets (RWAs) in percent of total assets. Risk density is a general proxy for the risks taken by an institution.

The illustrated framework incorporates indicators applied for an ex ante assessment. If a bank is failing or likely to fail (FOLTF), a more in-depth analysis of the specific bank will be necessary. Additional indicators, e.g. regarding the liquidity situation and contagion via the liquidity channel, are of relevance in that case.¹⁸ Furthermore, authorities might have additional data sources (provided by the bank) at their disposal.

2.2 Calibration of thresholds

What is fundamental in any threshold calibration is a solid database with long time series. For our calibration, we use OeNB reporting data which allow us to assemble panel data with quarterly observations between 1999 and 2016. For some indicators, only shorter time periods are available.¹⁹ Threshold calibration differs depending on the type of indicator. The following types of indicators can be distinguished:

- stress indicators: the stress level in the financial market (e.g. indicators for the criterion financial market condition)
- risk exposure indicators: banks' risk exposure (e.g. for indicators covering indirect contagion)
- system-share indicators: banks' significance in the market (e.g. for indicators covering economic importance)
- network indicators: interconnectedness of financial institutions (e.g. for indicators revealing direct contagion)

The thresholds are set for the various indicators (see section 2.1) depending on their type. The stress indicators are the basis for all thresholds as they determine if the threshold level is lowered in periods of observed stress. The risk exposure indicators are similar to stress indicators as they are not analyzed in isolation but in combination with other indicators (mainly system-share indicators). These indicators are used for banks which are heavily exposed to a specific risk. But the bank will be identified as potentially putting financial stability at risk only if the size of the bank (or the size of the risk) is significant enough to threaten financial stability. System-share and network indicators will identify a bank as systemically important if a threshold is breached. To assess substitutability, it is not just economic and technical feasibility that is relevant; how quickly a service can be substituted is crucial as well. Therefore, "number of ..." indicators like the number of clients or the number of transactions that need to be substituted are analyzed as well. Chart 1 illustrates the types of indicators and their relation. In this paper, we focus only on the economic perspective.

Indicators for financial market conditions like the Austrian Financial Stress Indicator (AFSI) are stress indicators. They reflect the current financial market conditions and help to determine the current economic cycle. These stress indicators do not determine per se whether a bank is systemically important or not. If the stress indicator shows no sign of turmoil, the baseline scenario thresholds can be

¹⁸ In that case, liquidity stress tests are implemented to assess spillover effects to other banks using the reporting template: *Additional Maturity Ladder, C66.00*.

¹⁹ For some indicators, reporting requirements were established only after 1999.

Chart 1

applied. In the case of a tense market environment, stricter thresholds should be used as defined later in this article.

Indicators reflecting a bank's economic importance are mostly of the system share indicator type. The thresholds for these system share indicators are set based on a substitutability assessment. The basic idea behind this approach is that the financial system is not at risk if the market activities²⁰ of a failing bank can be absorbed without frictions by other market participants. We compare an individual bank's value for a given indicator (*Ind*)²¹ with the quarterly change of the same indicator throughout the entire banking system. To that end, we look at the empirical distribution of quarterly changes of the selected system share indicator based on banks' regulatory reporting data over a long time horizon. We assume that the time series of each system share indicator *i* is a random variable for each bank *j* and for the aggregated banking system *A*. We calculate the aggregated empirical distribution of the quarterly changes of each indicator and its expected value (*E*) and standard deviation (σ). The individual distributions (of quarterly changes for each indicator per bank from the panel data set) are helpful for robustness checks of the aggregated distribution.

Based on that assessment, we derive four equations to estimate quantitative thresholds.

$$Ind_{i_f,j}^T \leq E(\Delta Ind_{i_t}^A) \dots \text{low (L)} \quad (1)$$

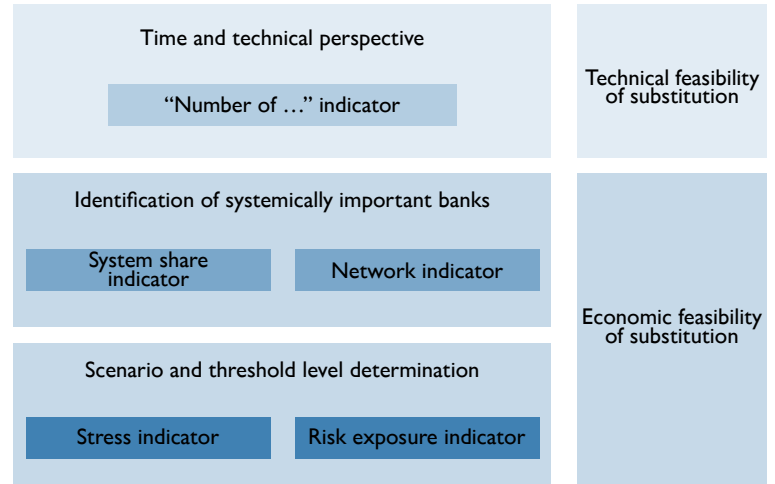
$$E(\Delta Ind_{i_t}^A) < Ind_{i_f,j}^T < E(\Delta Ind_{i_t}^A) + \sigma(\Delta Ind_{i_t}^A) \dots \text{medium low (ML)} \quad (2)$$

$$E(\Delta Ind_{i_t}^A) + \sigma(\Delta Ind_{i_t}^A) \leq Ind_{i_f,j}^T < E(\Delta Ind_{i_t}^A) + 2\sigma(\Delta Ind_{i_t}^A) \dots \text{medium high (MH)} \quad (3)$$

$$Ind_{i_f,j}^T \geq E(\Delta Ind_{i_t}^A) + 2\sigma(\Delta Ind_{i_t}^A) \dots \text{high (H)} \quad (4)$$

Ind... indicator as a share in total banking sector volume of the indicator for all *i*... type of indicator and *i_f* for the flow (new business) of indicator *i* for bank *j*, if flow data is available; if not, our conservative approach is to use stock

Overview of indicator types in determining systemically important banks from an economic and technical perspective



Source: OeNB.

²⁰ Market activities of relevance are reflected by the criteria, subcriteria and indicators described in section 3.1.

²¹ The indicator is measured as a share at an aggregated level to be comparable with the quarterly changes. If a flow quantity is used, the flow indicator is also measured as share of the stock of the aggregated value (to ensure comparability).

data
 for all banks j
 for a fixed time T
 $\Delta Ind...$ changes over t : quarterly time series
 A... banking system

Equation (1) means that an individual bank j 's share of an indicator's aggregated volume is smaller than the expected value (E) of the quarterly changes of the indicator. In that case, the market exit of the bank probably has no effect on financial stability.

Equation (2) means that the bank j 's share is higher than (E) but lower than (E) plus its standard deviation. It describes an event that might be noticeable but will not put financial stability at risk in normal times.

For illustration purposes only, assume for the moment a standard normal distribution²² of an indicator: under this assumption, the category "medium high" with a higher than expected value plus one standard deviation would be reached or exceeded in 15.9% of cases. Category "high" (equation (4)) would be obtained in 2.2% of cases, meaning an average occurrence every 10 to 11 years. We consider these probabilities to be conservative but adequate to approximate a potential impact on financial stability.

We illustrate the approach for the indicator *total loans to the private sector*, which is part of the subcriterion *significance of the credit institution for the real sector*. We use time series of loans to the private sector for each bank (volume) and of the percentage quarter-on-quarter changes in absolute²³ terms (quarter-on-quarter changes). Second, to estimate the expected value of quarterly changes, we calculate the arithmetic mean of the changes of the banking system over the entire period (average change) and the standard deviations of the changes. Quarterly changes are used because time is critical, and the exit of the bank must be absorbed unexpectedly and quickly. Third, we compare the bank's average volume of new loan production²⁴ with the average change computed in step two. We use the new loan flow rather than the loan stock because the crucial question is whether other banks can substitute for the typical volume of new loans. If the failing bank's typical new loan production is lower than the average change of the loan stock of all banks in the system, the loan demand that would be met by this bank can easily be absorbed by other lenders. Therefore, it can be concluded that this bank's failure is unlikely to threaten financial stability (low impact). Applied to Austrian private sector loans, this threshold would be 1.2%.

The failure of a bank with a new loan production that is lower than this value would not be considered to have a significant negative effect on financial stability. If the value is higher than the mean plus two standard deviations, the failure would be considered to have potentially significant negative effects on financial stability, as timely and frictionless substitution is less likely (high impact). For Austria this would equal a threshold for private sector loans of 3.1%.

²² In practice, we use empirical distributions when applying our framework for system share indicators.

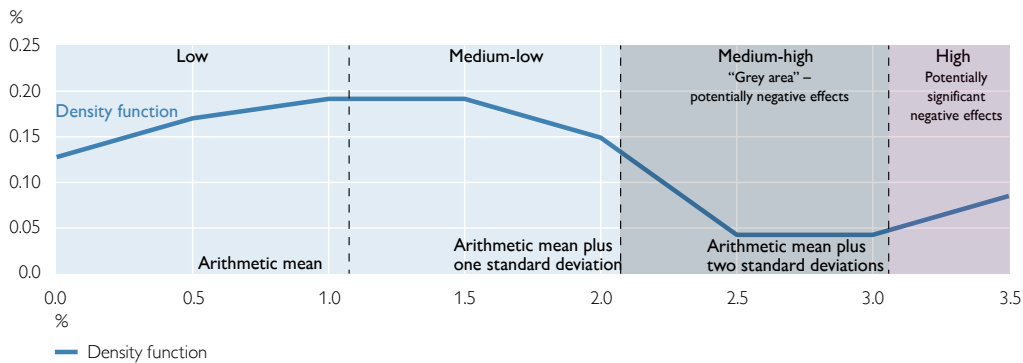
²³ We use absolute terms as we postulate that positive and negative market changes should be treated similarly, as both had no negating effects on financial stability.

²⁴ We apply a two-year average period. The last year reflects current information. The average period should emphasize this current information on the one hand but needs to control for volatility over time on the other hand.

Chart 2

Thresholds for the indicator “total loans to private sector”

Density function of Austrian bank loans to the private sector, quarter-on-quarter change (Q3 2004 – Q1 2016)



Source: Authors' calculations.

Less clear is the handling of banks that are between low and high impact. We define a “grey area” that is between the arithmetic mean plus one standard deviation (medium-high impact) and the threshold for high impact (arithmetic mean plus two standard deviations). For the chosen indicator of private sector loans in Austria, this medium-high threshold would be at 2.2%. Very prudent authorities might also consider these banks as likely to threaten financial stability (although not severely).

Chart 2 illustrates the distribution of quarterly changes of private sector loans of the Austrian banking system for the period Q3 2004 to Q1 2016. The threshold marking the area with potential significant negative effects on financial stability is set at the mean plus two standard deviations. The “grey area” is defined as the area between the arithmetic mean plus one standard deviation and the mean plus two standard deviations.

This approach (comparing the median quarterly rate of change for the banking system with the relevant bank’s volume) can be applied in the same way to the other system share indicators. One example is the indicator *total assets* (reflecting the subcriterion *size*). Here, too, one can argue that it is not the whole stock (in that case, the entire balance sheet) that needs to be substituted for by other (Austrian) market participants for a frictionless market exit. Actually, only new business of some parts of the balance sheet is of relevance. Hence, authorities could apply a haircut on the total assets to estimate more realistically the sum of assets that needs to be substituted for.

For the assessment of a bank’s interconnectedness, network indicators are used. The methodology differs from that used for system share indicators, while the threshold setting works similarly. For network indicators, a broad range of literature exists (see Allen and Gale, 2000; Eisenberg and Noe, 2001). Generally speaking, a network is defined as a set of nodes (in our case, banks) and a set of linkages between them. Different centrality measures exist to evaluate these linkages (for an application to the Austrian banking system, see Pühr et al., 2012). For example, node strength centrality, the simplest centrality measure, is defined as the number of links from a node. We use a set of different centrality measures for the Austrian

interbank network, based on Austrian central credit register data. For cross-border linkages, we use the Katz centrality (Katz, 1953). Thresholds for network indicators can be set in the same manner as thresholds for system share indicators, but the random variable is the indicator at a fixed time T (not a time series) over all banks in Austria. For robustness checks of the statistical figures, we use all available calculations of the network indicators for the last years.

$$E(Ind_{i,j}^T) + \sigma(Ind_{i,j}^T) \leq Ind_{i,j}^T < E(Ind_{i,j}^T) + 2\sigma(Ind_{i,j}^T) \dots \text{medium high (MH)} \quad (5)$$

$$Ind_{i,j}^T \geq E(Ind_{i,j}^T) + 2\sigma(Ind_{i,j}^T) \dots \text{high (H)} \quad (6)$$

Ind. . . random variable: indicator
for all i . . type of indicator
over j banks in the AT banking system
at a fixed time T

Risk exposure indicators measure the significance of certain risks to a bank. They are particularly important to assess indirect contagion caused by common exposures prevalent across the system. Similarly to the stress indicators, these indicators need to be analyzed not in isolation but in combination with a corresponding system-wide indicator. They help identify banks that are highly exposed to certain risks (e.g. banks with a business model strongly dependent on real estate loans).

We start by evaluating whether this risk exposure could threaten financial stability if the bank fails or is likely to fail. We identify a bank as heavily exposed to a certain risk (e.g. real estate loans, covered deposits or OTC derivatives) if that risk as a share of total assets meets equation (8). The bank is seen as “highly” exposed if the risk exposure is higher than the average plus two standard deviations. Banks whose exposure is lower than that but higher than the average plus one standard deviation are, again, seen as part of a “grey area.”²⁵

$$E(Ind_{i,j}^T) + \sigma(Ind_{i,j}^T) \leq Ind_{i,j}^T < E(Ind_{i,j}^T) + 2\sigma(Ind_{i,j}^T) \dots \text{medium high (MH)} \quad (7)$$

$$Ind_{i,j}^T \geq E(Ind_{i,j}^T) + 2\sigma(Ind_{i,j}^T) \dots \text{high (H)} \quad (8)$$

Ind. . . random variable: indicator
for each i type of indicator
over j banks in the AT banking system
at fixed time T

Based on the assessment of the risk exposure indicators, we reconsider the corresponding system share indicator. For instance, if a bank is heavily exposed to OTC derivatives, the threshold for the system share indicator measuring the volume of derivatives is set one standard deviation lower than it is for banks that are not heavily

²⁵ To evaluate common exposure, further analysis can be done to define robust thresholds depending on the riskiness and the volume of the exposure for/in the banking sector.

exposed.²⁶ In this case, a bank is already classified as “high risk” as measured by the system share indicator if equation (3) is met.

Finally, the thresholds for both the system share and the network indicators also depend on the *stress indicators*, as mentioned above. If the stress indicators are higher than the long-term average plus two standard deviations, we consider the market to be under stress. In the case of an adverse market environment, even the failure of a bank exposed to lower risk might cause market turmoil (i.e. there is a lesser degree of substitutability). We suggest shifting all thresholds for system share and network indicators down by one standard deviation in that case.

“Number of...” indicators evaluate how many clients or services will potentially be affected if a bank fails. This can have an impact on how quickly time-critical services such as payment services can be substituted for by other market participants. Thresholds for these indicators can be calibrated similarly to the thresholds for system share indicators. For some of these indicators, thresholds must be set due to operational or technical limitations.

Finally, the individual indicators need to be brought together into an overall assessment. Our basic aim is not to miss any single source of financial stability risk. Therefore, we argue that one single indicator identified as “high” should be enough to judge the bank as systemically relevant.

2.3 Thresholds under stress scenarios

As already mentioned above, one major challenge is to determine specific thresholds for periods of stress. In addition to market-induced stress, we suggest additional adverse but plausible stress scenarios that could occur even while markets are stable. For the Austrian banking sector, we have identified three scenarios (see section 1): (1) a macroeconomic downturn in CESEE with negative implications for the Austrian banking sector, (2) stress in the real estate market and (3) tensions after a deposit insurance event. To develop the scenarios, we look into historical evidence to understand their economic drivers. In a first step, we identify similar historical crises (in Austria and globally) and quantify contagion channels. In a second step, we identify Austrian banks that are heavily exposed by way of the common exposure indicator (see risk exposure indicators above). In a third step, we assess the contagion channels to the Austrian banking sector for each of these banks in the event of a likely failure (FOLTF). As a result of the first three steps, we identify those banks that are additionally relevant under the given scenario.

For example, under the scenario “tense market after deposit insurance event in Austria,” we first assess historical deposit guarantee events for similar banking systems and their effects on financial stability and the real economy. Second, we identify Austrian banks with high shares of guaranteed deposits. Third, we capture the contagion channels, e.g. the remaining funds in the deposit guarantee funds and the remaining risk mitigating capacities of the banking system. As a result, we are able to identify additional banks that potentially threaten financial stability under this scenario.

²⁶ Banks need to be of a substantial size so that their failure has severe contagion effects. Hence, the trade-off between proportionality and the degree of a bank’s risk exposure is considered for indicators of the type “risk exposure.”

3 Conclusions

We develop a comprehensive framework to identify banks with potential significant negative effects on financial stability. The framework consists of more than 30 quantitative indicators grouped under the four main criteria financial market conditions, economic importance, direct contagion and indirect contagion.

Also, the paper aims to establish a consistent approach to macroprudential supervision by emphasizing the consistency between crisis prevention and crisis resolution. For the Austrian banking system with more than 600 banks, a quantitative indicator-based framework with consistent thresholds across banks and indicators is crucial. The quantitative assessment of thresholds should enable macroprudential and resolution authorities to identify systemically important banks in a transparent and plausible way. While setting thresholds entails some supervisory discretion and expert judgment of the risk appetite of the institution, our framework can help authorities to be more reliable, consistent and transparent. Moreover, the disclosure of criteria for threshold settings contributes to avoiding unintended biases.

The main idea behind our methodological approach is that if market activities of a failing bank can be substituted for without frictions by other market participants, the financial system is not at risk. We have shown that the substitutability and therefore the thresholds depend on the economic environment and that lower thresholds are appropriate for country-specific stress scenarios.

The application of our framework could reduce the probability of public bailouts. Our results help us to understand the risks the Austrian banking system is faced with and to address them with adequate macroprudential instruments or through recovery and resolution planning, in order to reduce the probability and the impact of the next crisis.

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Annex

Table A1 provides an overview of quantitative indicators within the four main criteria financial market conditions, economic importance, direct contagion and indirect contagion.

Table A1

Overview of quantitative indicators

Criteria and subcriteria	Indicators
Financial market conditions	
Financial market conditions	Austrian Financial Stress Index (AFSI) for the stress level in Austria Composite Indicator of Systemic Stress (CISS) in the euro area
Economic importance	
Size of the credit institution and its share in the Austrian banking sector	Total assets
Significance of the credit institution for the real sector	Total value of deposits Total loans outstanding Total number of depositors Value of domestic payment transactions Loans (number of borrowers, percentage share of the institution's borrowers in total number of borrowers)
Nature and amount of the credit institution's liabilities to other credit institutions, interconnectedness with other financial market participants	Interbank liabilities Interbank assets Debt securities issued
Nature and amount of the credit institution's cross-border business	Cross-border liabilities Cross-border claims Share of cross-border business in consolidated total assets
Direct contagion	
Type, complexity, amount and composition of risk accepted by the credit institution	Derivatives in the trading book "Small trading book" Value of OTC derivatives Volume of OTC derivatives as a percentage of total assets
Network indicator for direct contagion risks	Network indicator for direct contagion within the Austrian banking sector Network indicator for direct contagion within the network of the banking sector's cross-border linkages Contagion rank
Indirect contagion	
Common exposure	Interbank loans as a percentage of total assets Securities held as a percentage of total assets Mortgage loans as a percentage of total assets SME loans as a percentage of total assets Consumer loans as a percentage of total assets Cross-border business as a percentage of total assets Interbank deposits as a percentage of total assets Other deposits as a percentage of total assets Securities issued as a percentage of total assets
Risks stemming from covered deposits	Risk exposure associated with covered deposits Risk exposure associated with the share of deposits covered by deposit guarantee schemes (DGSs) Impact of DGS event on the credit institution
Risk density	Risk density percentage share of risk-weighted assets in total assets

Source: Authors' compilation.

Quantifying interest rate risk and the effect of model assumptions behind sight deposits

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Refereed by: Pierluigi Bologna, Banca d'Italia

Have Austrian banks taken on higher interest rate risks amid the low interest rate environment? According to the interest rate risk statistics, which quantify the effect of the regulatory 200-basis-point interest rate shock, interest rate risk as reported by banks has not risen significantly since the beginning of the low interest rate period. However, in measuring interest rate risk, banks need to rely on model assumptions, especially with regard to the repricing dates they assume for customer deposits. Harnessing this room for maneuver, banks may compensate for longer fixation periods on the assets side (maturity transformation). In turn, a higher degree of maturity transformation and interest rate sensitivity might not be fully reflected in the reported interest rate risk. Analyzing this room for maneuver, we calculate Austrian banks' interest rate risk level over time while assuming standardized and conservative repricing dates. Under these conservative repricing dates, a different picture on interest rate risks emerges especially for large banks. We conclude that large banks in Austria have seen a marked increase in maturity transformation over time, which was mirrored by small and medium-sized banks to a lesser extent. It follows that interest rate risk in the banking book, and its quantification, is now more relevant for evaluating banks' business models and capital adequacy than was the case before the start of the low interest rate phase.

JEL classification: G21, G28, G38, E43

Keywords: interest rate risk, maturity transformation, low interest rate environment, risk quantification and management, bank capital

Since the European Central Bank (ECB) embarked on its current monetary policy stance (negative interest rates, sovereign and corporate bond purchases), one question has come up time and again: what effect does this accommodative stance have on the profitability of banks in the euro area? Given that this issue is highly relevant for monetary policy makers and bank supervisors, it has been discussed regularly by the Oesterreichische Nationalbank (OeNB). Kerbl and Sigmund (2016) examine the empirical relationship between low interest rates and net interest margins, simulating the asymmetric effect of negative interest rates on profitability. They show that the low and negative interest rate environment adversely affects banks' net interest income (see e.g. also Drescher et al., 2016; Eggertsson et al., 2019; Genay and Podjasek, 2014; Gros, 2018).

This effect is less evident with large banks, as shown by Kerbl and Sigmund (2016), and is possibly explained by banks (partly) compensating for this by (a) higher credit volumes, (b) higher credit risks or (c) higher interest rate risks. The positive link between higher interest rate risks and a higher net interest margin has been corroborated, among others, by Angbazo (1997) and Entrop et al. (2015; see also the discussion in Bologna, 2018).

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Yet, when the interest rate risk as reported by banks is considered (see also chart 2), then no increased interest rate risk is observable during the period of accommodative monetary policy.

For this reason, OeNB bank examiners, when they started carrying out business model-related on-site inspections at the end of 2017, focused, *inter alia*, on interest rate risk. What they observed was that banks were engaging more and more in maturity transformation due to its positive effect on net interest income. In other words, banks were striving to compensate for the contracting net interest margin by making longer-term investments (i.e. longer interest rate fixation periods), which, according to the banks, also tied in with the customers' demands. Nevertheless, the higher degree of maturity transformation was not reflected by an increase in the risk reported.² We assumed that the respective banks continuously raised the (fictitious) interest rate fixation period of sight deposits and hereby offset the longer interest rate fixation periods on the assets side. In this study, we confirm this hypothesis.

1 Interest rate risk – basic facts

According to classical finance theories (see e.g. Hicks, 1946), maturity transformation is an integral part of the banking business: in other words, credit institutions extend long-term finance (by granting long-term loans) and engage in short-term funding (by taking in short-term or sight deposits). This denotes maturity transformation from a *liquidity perspective*.

Another form is maturity transformation from the *interest rate perspective*. Interest rate fixation periods may deviate from liquidity deadlines both on the assets side (e.g. variable rate loans) and on the liabilities side (e.g. deposits with a floating rate).

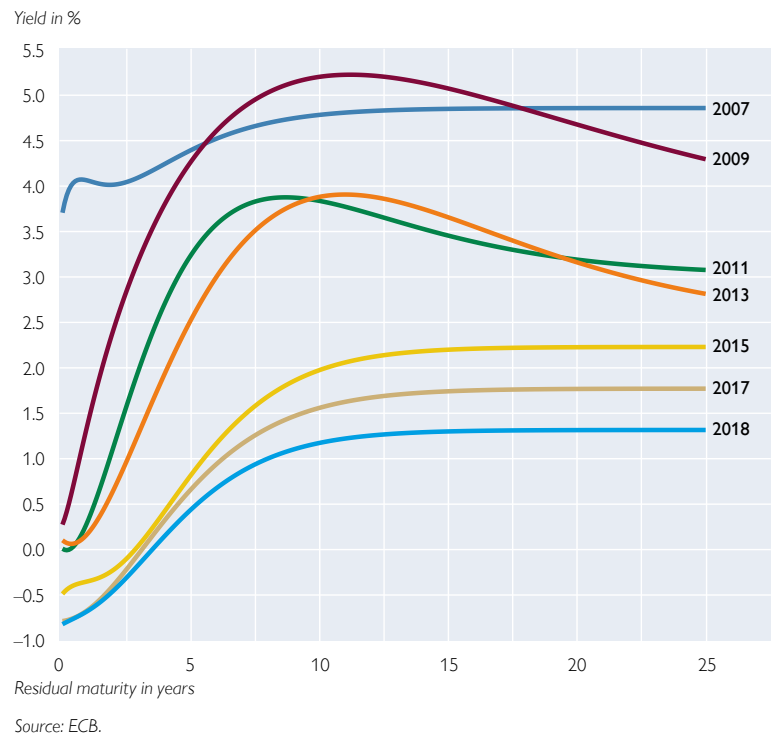
A bank's net interest income depends, *inter alia*, on the difference between the risk-free interest rate applicable to assets and liabilities.³ With a "normal" upward sloping yield curve, the long-term interest rates exceed the short-term interest rates. Credit institutions earn a structural contribution if the interest rate fixation period of their lending business is higher than that of their deposit business.

Chart 1 displays the yield curves in the euro area (for AAA-rated sovereigns) from year-end 2007 to year-end 2018. For readability, we only show the yield curve for every other year, with the exception of 2017 and 2018. We see that (1) the yield curve was upward sloping during the whole period (least pronounced in 2007), and that (2) especially after 2013, yields were substantially compressed over the entire maturity range. The first observation implies that banks can increase net interest income by means of maturity transformation, and the second – in combination with depressed margins in times of low rates (see the literature section above) – that banks have a stronger incentive to do so.

² As explained in section 2, the interest rate risk statistics are part of a bank's reported "asset, income and risk statement" under statutory law. At the unconsolidated level, credit institutions submit quarterly reports in line with Annex A3b of the Regulation on Asset, Income and Risk Statements; at the consolidated level, banking groups pursuant to Article 59 and Article 59a Austrian Banking Act submit quarterly reports in line with Annex B3b and C3b of the Regulation on Asset, Income and Risk Statements.

³ Another important driver is the margin contribution, which equals the difference between the credit institution's credit spread (margin contribution on the liabilities side) and its customers (margin contribution on the assets side). The relationships are presented here in a simplified manner.

Chart 1

Yield curves in the euro area, 2007–2018

There is no reward/return without risk, which is why this type of maturity transformation carries interest rate risk: if interest rates increase along the entire yield curve, the present value of long-term positions declines more strongly than that of short-term positions. The risk of a decline in the present value of banks' own funds results from the contribution (= return) of maturity transformation.

While no capital charge is applied to this risk under Pillar 1 of the Basel framework, limiting the exposure of banks to interest rate risk falls into the responsibility of – in this order – the banks' management, the auditors and the supervisory authority (BCBS, 2016; or pursuant to Article 69 para. 3 Austrian Banking Act). The supervisory authority must take measures if the interest rate risk calculated using the standardized approach (i.e. the risk that a bank's present value declines as a result of a sudden and unexpected change in interest rates) exceeds a particular threshold, which, according to statutory law, has been set at 20% of the bank's eligible own funds. In addition, greater attention has been paid in the past few years to interest rate risk under Pillar 2.⁴

In essence, interest rate risk is measured by calculating the value of assets and liabilities under the assumption of an increase (or decrease) of the interest rate level, i.e. a parallel shift of the yield curve. The value of financial instruments with long-term interest rate repricing frequencies (such as fixed rate mortgages) declines more strongly than that of instruments with short-term interest rate repricing frequencies (such as money market loans).

With sight deposits, it is necessary to make assumptions. Interest rate risk is not just underpinned by objective factors: the above-said would presuppose that the rate fixation period is clearly determined for all types of a bank's business, but this is not true for products whose rates are not contractually fixed. Sight deposits are the most prominent case in point. On the one hand, the interest rates applied to sight deposits may deviate from money market interest rates, and on the other hand, customers may withdraw money on a daily basis without prior notice. This is important not only from a liquidity risk perspective, but also from an interest rate risk perspective, because should rates rise, banks must substitute deposits withdrawn by customers with higher market interest rates. For this reason, banks model rate fixation periods for products and activities without contractual interest

⁴ See e.g. European Banking Authority (EBA, 2018).

rates (hereinafter referred to as non-maturity deposits⁵ – NMDs) when they measure their interest rate risk. In this study, we take a closer look at these modeling assumptions.

When modeling the rate fixation periods of NMDs, i.e. behavioral repricing dates, banks deal with regulatory caps: In 2015, the European Banking Authority (EBA) stipulated that the assumed behavioral repricing date is to be constrained to a maximum average of five years.⁶ In 2018, the EBA released a revised guideline according to which the five-year cap applies individually for each currency.⁷

2 Interest rate risk statistics

“Interest rate risk statistics”⁸ are meant to ensure that the calculation of interest rate risk in the banking book (IRRBB) using a standardized method is comparable and traceable across banks and to support the identification of the key bank-specific determinants of IRRBB. The 200-basis-point interest rate shift is the central measure in this respect; it estimates the drop in a bank’s present value of own funds if the interest rate level increases or decreases by 200 basis points (the maximum reduction in the present value in both scenarios).

In simple terms, the 200-basis-point shift is calculated as follows: Balance sheet items on the assets and liabilities sides as well as long and short off-balance-sheet positions are slotted into different maturity buckets (modified duration buckets) according to their repricing dates and the currencies in which they are denominated. Derivative positions are evaluated at delta equivalents and likewise reported. In a next step, the sign of the net position is determined by a simple difference for each maturity bucket or duration bucket and currency. This net position is multiplied by a proxy for the net present value change⁹ in the event of a (200-basis-point) change in the maturity-matching interest rate. Thus weighted, net negative and positive positions are then added together for each currency, and the resulting absolute values are thereafter summed up across currencies. The outcome of this analysis is independent from the calculation method via maturity or modified duration buckets provided that the positions have been allocated in line with the reporting guidelines.

Classical maturity transformation as applied by banks results in more assets at the long end (i.e. in the buckets with a long rate fixation period) and more liabilities at the short end (i.e. in the buckets with a short rate fixation period). This overhang of the assets side at the long end and the overhang of the liabilities side at the short end give rise to interest rate risk (IRR): a change in interest rates changes the present value of own funds. In the quantification of IRR, the size and the structure of the overhang are key.

With respect to NMDs, credit institutions have to model the repricing dates. Such model estimates are aimed at predicting the outflow of NMDs in the event of a 200-basis-point interest rate shock and under the assumption that the bank keeps

⁵ Apart from sight deposits, some employee pension claims fall into this category, but size-wise, such claims are underrepresented in our case.

⁶ EBA (2015), para. 24(d).

⁷ EBA (2018), para. 115(o).

⁸ In the following, we do not consider trading book positions as capital charges apply to trading book interest rate risk.

⁹ That is, this measure approximates the present value change of the position in the event of a +/-200-basis-point parallel shift of the yield curve. For the requirements for calculating more complex interest rate scenarios, see BCBS (2016).

the interest rate on these NMDs unchanged. In turn, if the model estimates allocate NMDs to buckets with long rate fixation periods, this mitigates the long-end asset overhang that results from loans and bonds with contractually fixed repricing dates. Unlike, for instance, internal ratings-based (IRB) models, which have to be approved by the competent authority before they can be used, this modeling approach is not subject to such supervisory approval. While the validation of the assumptions may be challenged during relevant on-site inspections and the Austrian Financial Market Authority (FMA) or the ECB may impose pertinent requirements when following up on such inspections, there may be a significant time lag between the implementation of a new model (and its calibration) and the acknowledgment of the model by the supervisory authorities.

3 Objective

In this analysis, we aim to identify the extent to which banks took on more interest rate risk over the past few years, which, *ceteris paribus*, increased interest income. To this end, we draw on data reported by 482 (groups of) credit institutions¹⁰ and adjust these data for the effect of model assumptions to compare the interest rate risk over time and across banks.

The analysis is meant to shed light on the question whether maturity transformation has been stepped up in the Austrian banking system since the beginning of the low interest rate period. In addition, by employing the method introduced in the next section, we also gain insights into the extent to which banks model sight deposits in order to identify any outliers and model risks.

4 Methodology

To reach the desired level of comparability, it is first of all necessary to neutralize the impact of the heterogeneous model assumptions behind sight deposits. Please note that modeling heterogeneity does not necessarily have to be an indicator of misquantification, since the economic interest rate sensitivity of sight deposits indeed varies depending on the respective bank's business model. An in-depth assessment may only be carried out by way of an on-site inspection.

This notwithstanding, reporting data may be used to perform plausibility checks on a bank's model assumptions, especially for the purpose of peer group comparisons. The bolder the model assumptions are, the higher is the model risk of the respective bank. Model risk exists even in cases where the model assumptions are justified and have been validated accordingly. Reliable validation coupled with conservative model assumptions help reduce the resulting model risk¹¹.

To ensure a level playing field for banks regarding these model assumptions, we, for one thing, compute the IRR for all banks in the sample, using data reported in the interest rate risk statistics. For another thing, we edit the data reported by banks as follows: in line with their contractual maturity, we allocate NMDs to the time bucket with the lowest rate fixation period (*i.e.* less than one month). This represents the most conservative approach and the assumption of the shortest possible

¹⁰ To be precise, these data comprise all fully operating credit institutions at the highest level (*i.e.* consolidated in the case of groups) as at end-2017.

¹¹ For the provisions on how to consider these model risks, see EBA (2018) para.108(h,i).

fictitious rate fixation period.¹² To keep it simple, we call the thus calculated change in present value given an assumed interest rate change of 200 basis points under level playing field assumptions “interest rate risk under level playing field assumptions” or IRR-LPF, to refer to the time series of the changes in the present value calculated in this way.

In a second step, we compare the IRR-LPF with the reported IRR over time to identify any trends. A rising IRR-LPF time series is indicative of a bank’s increased maturity transformation. If the IRR-LPF time series rises more strongly than the reported IRR, the bank is likely to progressively model NMDs.

Finally, we sort and rank the results. We deem those credit institutions “model dependent” whose interest rate risk exceeds 20% of their own funds according to the IRR-LPF, i.e. banks that do not exceed the regulatory limit only thanks to model assumptions behind NMDs. In addition, we identify those institutions whose model assumptions on the fictitious maturity of sight deposits are more aggressive (longer duration) than the respective assumptions of the peer group.

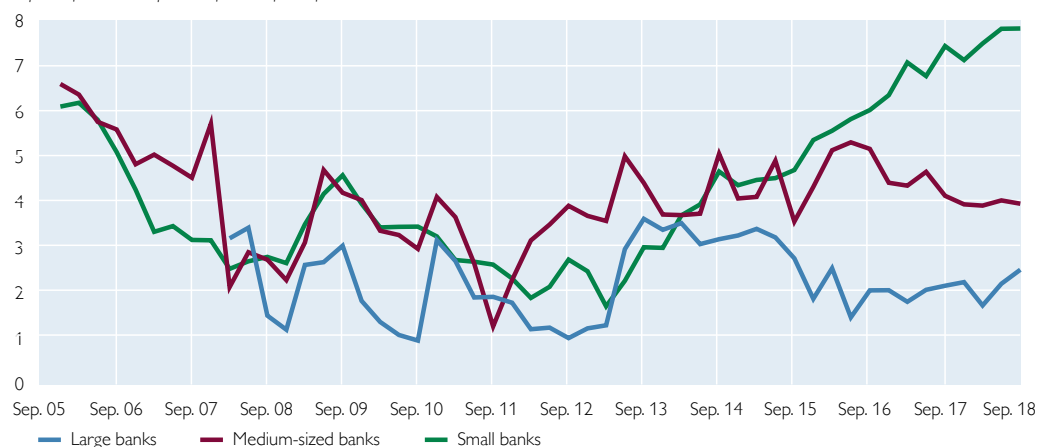
5 Outcome for bank aggregates

Chart 2 shows the interest rate risk reported by Austrian banks. It is evident from this chart that while small banks¹³ systematically increased their interest rate risk, neither medium-sized banks nor large banks increased their interest rate risk as reported in the interest rate risk statistics during the indicated period. For the remainder of this study, note that whenever we refer to bank aggregates (small, medium-sized and large banks), we refer to an average bank representative of the given sample and do not mean every individual bank classified as small, medium-sized or large.

Chart 2

Volume-weighted average of the reported IRR of three bank aggregates

Impact of 200-basis-point shift in % of own funds



Source: Supervisory statistics, authors' calculations.

¹² In fact, this corresponds to the most conservative assumption under a +200-basis-point shift of the yield curve.

¹³ Small banks: total assets < EUR 1 billion; medium-sized banks: total assets < EUR 20 billion; large banks: total assets ≥ EUR 20 billion. “Large banks” include all systemically important institutions according to Article 23c Austrian Banking Act. For a further description of the data, see the subsequent sections.

In the event of a +200-basis-point shift of the yield curve and based on the data reported by banks, the present value of large Austrian banks' own funds declines by less than 2% as of September 2018.

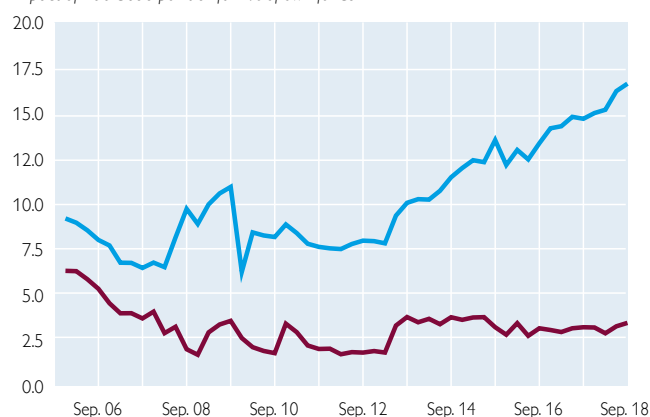
Chart 3 compares the reported IRR with the computed IRR-LPF. Especially large banks (total assets \geq EUR 20 billion) show a notable rise in the IRR-LPF, i.e. the interest rate risk under an assumed short rate fixation period for NMDs. This strong increase in large banks' exposure to interest rate risk has an impact on the average of the entire banking sector given large banks' weight. For medium-sized banks, only a moderate increase is observed. In parallel to their IRR, small banks' IRR-LPF went up in recent years.

Chart 3

Volume-weighted averages of the reported IRR and the IRR-LPF of four bank aggregates

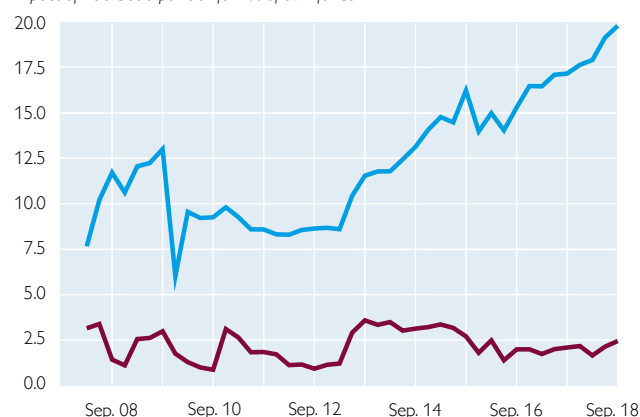
All banks

Impact of 200-basis-point shift in % of own funds



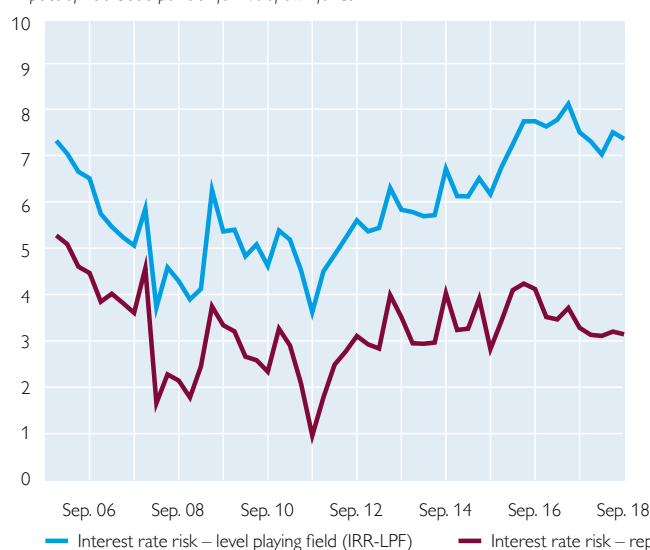
Large banks

Impact of 200-basis-point shift in % of own funds



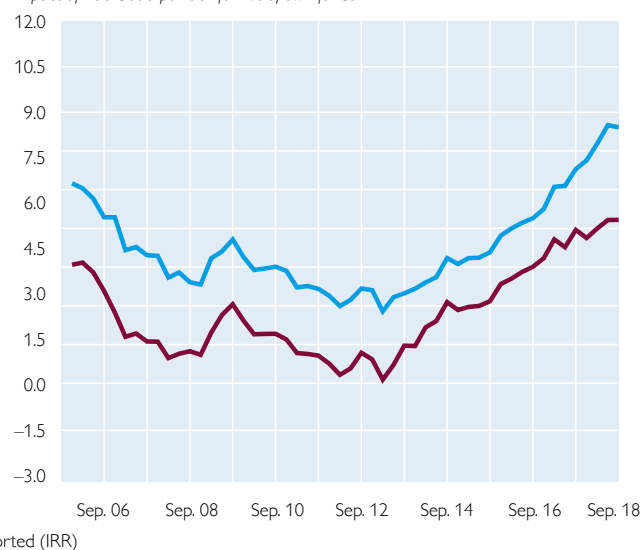
Medium-sized banks

Impact of 200-basis-point shift in % of own funds



Small banks

Impact of 200-basis-point shift in % of own funds



— Interest rate risk – level playing field (IRR-LPF) — Interest rate risk – reported (IRR)

Source: Supervisory statistics, authors' calculations.

Note: For large banks, the x-axis dates back to 2008 only in order to keep changes in the composition of the respective bank aggregates over time to a minimum. Please note that the y-axis features different percentages in all four panels.

In contrast to small banks, large banks' increased exposure to interest rate risk is not reflected in the reported 200-basis-point shift (IRR, dark red line in chart 3) but becomes evident only once the model assumptions, which change over time, are neutralized (IRR-LPF). It is noteworthy that, compared with small banks, large banks develop models considering interest rate fixation periods much more frequently.

IRR reported by large banks invariably amounted to less than 5% of own funds; in contrast, interest rate risk adjusted for model assumptions behind sight deposits (IRR-LPF) came to around 19.8% of own funds. Under level playing field assumptions, large banks' exposure to interest rate risk is considerably higher than the reported interest rate risk. One presumption is that large banks use the room for maneuver they have in considering NMDs in interest rate risk calculations to keep the IRR to be reported relatively low.

For better comparability across the banking aggregates, chart 4 shows the IRR-LPF adjusted for assumptions behind sight deposits.

The rise in large banks' interest rate risk coincides with the beginning of the low interest rate period; it is also a manifestation of large Austrian banks' stepped-up recourse to maturity transformation to fight off interest income erosion. In a similar vein, albeit from a low starting level, medium-sized and small banks also show a marked increase in interest rate risk since the beginning of the low interest rate period, which reflects their attempt to maintain the net interest margin by taking on more interest rate risk. Medium-sized banks started earlier to take on interest rate risk and display a stronger reliance on model assumptions than large banks but a larger model reliance than small banks, as reflected by the respective differences in IRR and IRR-LPF in chart 3. Compared to small banks, medium-sized banks have not extended their maturity transformation as monotonically as small banks and not as drastically as large banks but still show a marked increase in the IRR-LPF from 5% in 2011 to 9% toward the end of 2018.

In the following, we take a closer look at a case study that illustrates the magnitude of this phenomenon. Before we do so, however, we mention one caveat: some

Chart 4

Volume-weighted averages of the IRR-LPF of three bank aggregates

Impact of 200-basis-point shift in % of own funds



Source: Supervisory statistics, authors' calculations.

banks provide behavioral economic reasons for their model assumptions in the risk management talks with bank supervisors. For instance, banks pointed out that, amid the prevailing low interest rates, depositors hardly pay any attention to the interest rate on their instruments. This is why not changing the interest rate on deposits in tandem with the market would hardly have an impact on the deposit volume. Moreover, banks allegedly dispose of data (but only for individual countries in Central, Eastern and Southeastern Europe) that corroborate this hypothesis. It remains to be seen, however, whether this reasoning still applies to a deposit market that, driven by technological advances, is becoming ever more efficient.

6 Case study of a bank

For a case study, we chose an example bank in order to illustrate that implications for financial stability would arise if several banks hypothetically followed an aggressive interest rate risk strategy. These insights allow us to recommend specific general policy action for safeguarding financial stability, which we present in the final section.

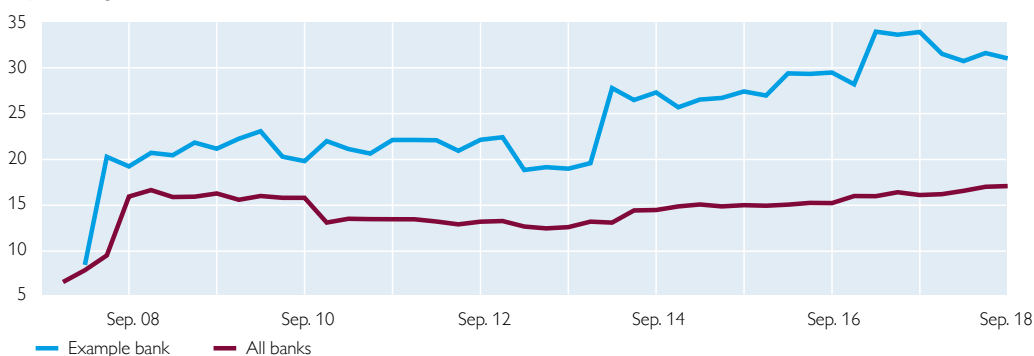
The example bank markedly increased its interest rate risk under level playing field assumptions in 2014 (when the zero interest rate period began), while at the same time reducing the interest rate risk reported in supervisory statistics. This difference may be traceable to two factors: (1) a fictitious rate fixation period for deposits in model assumptions which changes over time and (2) a rise in the deposit volume (quantity effect).

The first effect, the change in the assumptions about the interest rate sensitivity of sight deposits, is illustrated in chart 5. The chart shows the model assumptions this bank applies to sight deposits as compared with the volume-weighted average of all banks. At the beginning of 2018, the rate fixation period for sight deposits was assumed to be more than 30 months by the example bank in its model assumptions. The longer this assumed rate fixation period is, the greater is the deviation of the reported IRR from the IRR-LPF. The analogous average across all banks, and also of large banks, amounted to only about half that time. As to the example bank's assumptions, it is evident, on the one hand, that they were changed and, on the other, that they reached elevated values (> 2.5 years) as early as in 2013.

Chart 5

Comparison of the example bank's model assumptions behind sight deposits with all banks

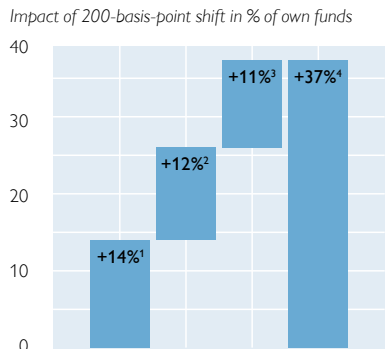
Exposure-weighted number of months



Source: Supervisory statistics, authors' calculations.

Chart 6

Factors determining the difference between the IRR-LPF and the reported IRR, as of 2018Q3



Source: Supervisory statistics, authors' calculations.

- ¹ Difference between LPF and modeling sight deposits at year-end 2011.
- ² Effect of changes to model assumptions between 2011Q4 and 2018Q3.
- ³ Increase in deposits since 2011Q4.
- ⁴ Total effect.

The computations underlying the second effect, the volume increase over time, are shown in chart 6. In the third quarter of 2018, the difference between the IRR-LPF and the reported IRR amounts to about 37% of own funds. This difference may be broken down as follows: the difference between the LPF model assumptions and the model assumptions used by the example bank for sight deposits at year-end 2011 accounts for some 14 percentage points (initial modeling effect). The effect of changes to the model assumptions for sight deposits between the fourth quarter of 2011 and the third quarter of 2018 equals some 12 percentage points (time-changing model assumptions). The increase in deposits recorded since

the fourth quarter of 2011 accounts for some 11 percentage points (quantity effect).

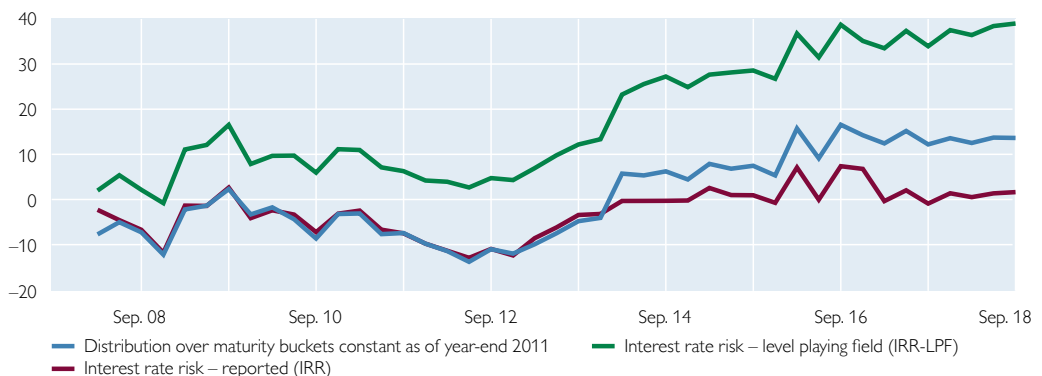
In addition to the calculated IRR-LPF and the reported IRR, chart 7 depicts the interest rate risk had the bank under review not adjusted the distribution of sight deposits over maturity buckets as of year-end 2011 (blue line). The difference between the latter and the reported IRR demonstrates that the bank lowered its reported interest rate risk by around 12% of own funds between the final quarter of 2011 and the third quarter of 2018 by changing the distribution across maturity buckets (time-changing model assumptions).

If the bank had not adjusted the distribution of sight deposits across maturity buckets as of year-end 2011, it would be exposed to interest rate risk of 14% instead of 2% of own funds at the end of the third quarter 2018.

Chart 7

IRR-LPF, reported IRR and constant distribution of sight deposits across maturity buckets

Impact of 200-basis-point shift in % of own funds



Source: Supervisory statistics, authors' calculations.

In the following, we explore whether this increase is ascribable to the bank's lending or derivative business (chart 8). As mentioned before, the reported IRR of the bank amounted to less than 2% of own funds in late 2018, while the IRR-LPF came to 39% of own funds. The interest rate risk inherent in that bank's derivative positions equaled about 30% of own funds. According to the reported data – where the interest rate sensitivity of on-balance and off-balance-sheet transactions is recorded separately –, the higher maturity transformation results not from on-balance-sheet lending, but from swap (i.e. derivative) positions.

While it is not relevant from the interest rate risk perspective whether the higher risk arises from the lending or from the swap business, it makes a difference from the liquidity risk perspective: swaps are subject to daily margin requirements. In a hypothetical case, increasing interest rates would trigger liquidity outflows. For example, at an interest rate sensitivity of the swap book of about 30% of own funds, such outflows could reach sizable dimensions. Under such scenarios, a bank's liquidity needs manifest themselves independent from the treatment in the balance sheet and in the interest rate risk statistics.

Chart 8

Reported IRR and IRR-LPF of the example bank and IRR of the derivative positions

Impact of 200-basis-point shift in % of own funds



Source: Supervisory statistics, authors' calculations.

7 Summary

In this study, we show that Austrian banks in aggregate increased their interest rate risk amid the low interest rate environment. The extent of such an increase becomes evident when the interest rate risk reported by banks is harmonized over time and across banks under conservative model assumptions for sight deposits which we introduced to ensure a level playing field.

From our analysis, we draw the following policy recommendations. First, it is important for supervisors to be aware of the general issue, namely that interest rate risk might be hidden under model assumptions on sight deposits. Financial stability experts should be knowledgeable about the general trend in interest rate risk and banking supervisors need to question banks' modeling assumptions and apply a harmonized approach in the supervisory review and evaluation process under Pillar 2.

Second, we could imagine that, in comparison with other euro area banks, Austrian banks are, generally speaking, not the only ones practicing interest rate risk modeling. Hence, we argue that, from a financial stability perspective, it might be worth taking a closer look at euro area banks' modeling choices for capturing depositor behavior. Third, we encourage further research to examine how much banks benefit from taking on more interest rate risk.

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Cutoff date for data: June 12, 2019

Conventions used:

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

	2011	2012	2013	2014	2015	2016	2017	2018
<i>Three-month rates, period average, %</i>								
Euro area	1.39	0.57	0.22	0.21	-0.02	-0.26	-0.33	-0.32
U.S.A.	0.34	0.43	0.27	0.23	0.32	0.74	1.26	2.31
Japan	0.34	0.33	0.24	0.21	0.17	0.08	0.06	0.07
United Kingdom	0.87	0.83	0.51	0.54	0.57	0.50	0.36	0.72
Switzerland	0.12	0.07	0.02	0.01	-0.75	-0.75	-0.73	-0.73
Czech Republic	1.19	1.00	0.46	0.36	0.31	0.29	0.41	1.27
Hungary	6.19	6.98	4.31	2.41	1.61	0.99	0.14	0.12
Poland	4.54	4.91	3.02	2.52	1.75	1.70	1.73	1.71

Source: Bloomberg, Eurostat, Macrobond.

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

	2011	2012	2013	2014	2015	2016	2017	2018
<i>Ten-year rates, period average, %</i>								
Euro area	4.31	3.05	3.01	2.28	1.27	0.93	1.17	1.27
U.S.A.	2.89	1.80	2.35	2.54	2.14	1.84	2.33	2.91
Japan	1.13	0.84	0.70	0.54	0.35	-0.06	0.05	0.07
United Kingdom	2.87	1.74	2.03	2.14	1.79	1.22	1.18	1.41
Switzerland	1.47	0.66	0.94	0.73	-0.06	-0.35	-0.08	0.04
Austria	3.32	2.37	2.01	1.49	0.75	0.38	0.58	0.69
Czech Republic	3.71	2.78	2.11	1.58	0.58	0.43	0.98	1.98
Hungary	7.64	7.89	5.92	4.81	3.43	3.14	2.96	3.06
Poland	5.96	5.00	4.03	3.52	2.70	3.04	3.42	3.20

Source: ECB, Eurostat, Macrobond.

¹ Yields of long-term government bonds.

Table A3

Stock indices

	2011	2012	2013	2014	2015	2016	2017	2018
<i>Annual change in %, period average</i>								
Euro area: EURO STOXX	-3.60	-6.36	17.53	13.07	11.76	-9.67	17.16	-0.48
U.S.A.: S&P 500	11.20	8.81	19.17	17.49	6.71	1.63	16.92	12.13
Japan: Nikkei 225	-5.81	-3.43	49.20	13.84	24.21	-11.90	19.41	10.44
United Kingdom: FTSE100	3.90	1.09	12.69	3.23	-1.38	-1.74	13.96	-0.21
Switzerland: SMI	-6.96	4.88	24.14	9.28	4.23	-10.12	10.91	-0.16
Austria: ATX	-3.69	-14.79	16.94	-2.36	1.28	-5.42	34.83	7.56
Czech Republic: PX 50	-5.11	-14.56	2.53	1.62	0.81	-11.49	14.29	7.88
Hungary: BUX	-8.67	-12.01	3.26	-3.89	17.28	28.94	31.55	5.55
Poland: WIG	4.36	-6.65	16.05	8.07	-0.31	-9.83	30.01	-2.67

Source: Macrobond.

Table A4

Corporate bond spreads¹

	2011	2012	2013	2014	2015	2016	2017	2018
<i>Percentage points, period average</i>								
Euro area								
AA	2.13	1.67	0.89	0.59	0.72	0.80	0.74	0.69
BBB	3.98	3.75	2.25	1.71	1.89	2.11	1.71	1.77
U.S.A.								
AA	1.68	1.50	1.12	0.88	1.04	0.93	0.74	0.76
BBB	2.34	2.59	2.17	1.76	2.13	2.21	1.54	1.59

Source: Macrobond.

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

	2011	2012	2013	2014	2015	2016	2017	2018
<i>EUR billion, four-quarter moving sum</i>								
Currency	1.1	0.6	1.2	0.9	0.7	0.6	0.6	0.8
Deposits	4.6	3.8	1.9	3.2	6.5	10.4	8.5	11.2
Debt securities ²	1.8	0.2	-1.8	-4.2	-3.5	-2.7	-2.7	-1.8
Shares and other equity ³	0.8	1.1	-0.1	1.9	-0.3	1.1	-0.4	0.4
Mutual fund shares	-1.4	0.9	2.7	3.5	4.1	3.1	3.8	2.2
Insurance technical reserves	2.9	3.7	3.4	3.3	1.3	1.1	0.2	-0.2
Other accounts receivable	0.2	0.0	0.0	1.7	1.1	-0.9	1.4	0.8
Total financial investment	10.0	10.3	7.3	10.3	9.9	12.7	11.4	13.4

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

	2011	2012	2013	2014	2015	2016	2017	2018
<i>EUR billion, four-quarter moving sum</i>								
Net disposable income	178.3	185.4	185.6	190.7	193.2	200.6	205.1	214.3
Savings	14.2	16.6	13.3	14.0	13.1	15.7	14.1	15.9
Saving ratio in % ²	7.9	8.9	7.1	7.3	6.8	7.8	6.8	7.4

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

	2011	2012	2013	2014	2015	2016	2017	2018
	<i>EUR billion, four-quarter moving sum</i>							
Debt securities ¹	4.2	2.8	1.7	-0.7	0.0	0.7	-1.8	-3.1
Loans	6.4	0.6	7.0	3.3	5.8	14.6	14.6	4.2
Shares and other equity	9.6	2.4	4.4	4.1	2.4	3.6	10.9	4.3
Other accounts payable	3.4	0.9	3.1	2.9	4.7	6.1	3.4	7.2
Total external financing	23.6	6.7	16.2	9.6	12.9	25.0	27.1	12.6

Source: OeNB (financial accounts).

¹ Including financial derivatives.

Table A8

Insolvency indicators

	2011	2012	2013	2014	2015	2016	2017	2018
Default liabilities (EUR million)	2,775	3,206	6,255	2,899	2,430	2,867	1,863	2,071
Defaults (number)	3,260	3,505	3,266	3,275	3,115	3,163	3,025	2,985

Source: Kreditschutzverband von 1870.

Note: Default liabilities for 2013 include one large insolvency.

Table A9

Housing market indicators

	2011	2012	2013	2014	2015	2016	2017	2018
Residential property price index	<i>2000=100</i>							
Vienna	156.1	180.7	196.3	204.6	209.2	217.2	220.4	232.0
Austria	132.7	149.1	156.0	161.4	168.1	180.4	187.2	200.1
Austria excluding Vienna	124.0	137.4	141.1	145.4	152.9	166.7	174.9	189.8
Rent prices¹	<i>2010=100</i>							
Rents of apartments excluding utilities, according to CPI	103.3	107.8	111.2	115.6	120.7	124.4	129.6	134.4
OeNB fundamentals indicator for residential property prices²								
Vienna	2.6	11.4	15.4	16.0	16.0	17.2	19.1	21.4
Austria	-5.8	-0.2	-1.3	-1.5	0.2	4.6	8.9	12.2

Source: OeNB, Vienna University of Technology (TU Wien).

¹ Free and regulated rents.² Deviation from fundamental price in %.

Austrian financial intermediaries¹

Table A10

Structural indicators

	2011	2012	2013	2014	2015	2016	2017	2018
	<i>End of period</i>							
Number of banks in Austria	824	809	790	764	738	672	628	597
Number of bank branches	4,441	4,468	4,359	4,255	4,096	3,926	3,775	3,639
Number of foreign subsidiaries	105	101	93	85	83	60	58	55
Number of branches abroad	152	146	151	200	207	209	215	219
Number of bank employees ¹	79,706	79,110	77,712	75,714	75,034	74,543	73,712	73,508

Source: OeNB.

¹ Number of persons, including part-time employees, employees on leave or military service, excluding blue-collar workers.

Table A11

Total assets

	2011	2012	2013	2014	2015	2016	2017	2018
	<i>End of period, EUR million</i>							
Total assets on an unconsolidated basis	1,014,278	982,114	927,155	896,424	859,165	832,267	815,275	854,582
Total assets on a consolidated basis	1,166,313	1,163,595	1,089,713	1,078,155	1,056,705	946,342	948,861	985,981
Total assets of CESEE subsidiaries ¹	270,045	280,629	264,998	285,675	295,557	184,966	205,532	206,582
Leverage ratio (consolidated, %) ²	5.8	6.1	6.5	6.1	6.3	7.6	7.7	7.7

Source: OeNB.

¹ The transfer in ownership of UniCredit Bank Austria's CESEE subsidiaries to the Italian UniCredit Group limits the comparability of figures as of end-2016.² Definition up to 2013: tier 1 capital after deductions in % of total assets. Definition as of 2014 according to Basel III.

Table A12

Sectoral distribution of loans to domestic nonbanks

	2011	2012	2013	2014	2015	2016	2017	2018
	<i>End of period, EUR million</i>							
	All currencies combined							
Nonbanks	329,912	330,385	326,820	328,324	333,970	338,322	341,227	355,983
of which: nonfinancial corporations	138,840	140,384	140,329	136,606	137,235	136,963	143,113	153,036
households ¹	138,353	139,056	139,052	140,946	146,432	153,501	156,376	161,991
general government	28,976	27,972	25,970	28,102	28,076	27,630	24,292	24,561
other financial intermediaries	23,586	22,806	21,244	22,578	22,127	19,987	17,316	16,395
	Foreign currency							
Nonbanks	57,231	47,652	40,108	36,288	33,950	30,089	22,181	20,567
of which: nonfinancial corporations	12,111	9,156	6,985	6,379	5,293	4,296	3,408	3,542
households ¹	38,716	32,905	28,385	25,374	24,423	21,224	16,486	14,994
general government	3,267	2,827	2,478	2,777	2,858	2,623	943	516
other financial intermediaries	3,133	2,761	2,257	1,759	1,374	1,945	1,343	1,515

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 A13

Loan quality¹

	2011	2012	2013	2014	2015	2016	2017	2018
	<i>End of period, %</i>							
Nonperforming loans in % of total loans (Austria ²)	4.5	4.7	4.1	4.4	4.0	3.2	2.5	2.0
Nonperforming loans in % of total loans (consolidated)	8.3	8.7	8.6	7.0	6.5	5.2	3.4	2.6
Nonperforming loans in % of total loans (Austrian banks' CESEE subsidiaries)	14.2	13.9	14.0	11.8	11.5	8.6	4.5	3.2
Coverage ratio ³ (Austria ²)	x	x	x	x	47	59	60	62
Coverage ratio ³ (consolidated)	x	x	x	x	54	53	52	51
Coverage ratio ³ (Austrian banks' CESEE subsidiaries)	43	48	53	57	59	67	61	64

Source: OeNB.

¹ As of 2017, data are based on Financial Reporting (FINREP) including total loans and advances. Data before 2017 only include loans to households and corporations.² Austrian banks' domestic business.³ Total loan loss provisions in % of nonperforming loans.

Table A14

Exposure to CESEE

	2011	2012	2013	2014	2015	2016	2017	2018
	<i>End of period, EUR million</i>							
Total exposure according to BIS ¹	216,086	209,818	201,768	184,768	186,397	193,273	210,616	217,078
Total indirect lending to nonbanks ^{2,3}	171,311	171,117	161,439	177,389	176,728	108,738	118,268	120,816
Total direct lending ⁴	52,010	51,539	52,926	43,144	40,866	32,976	28,507	27,526
Foreign currency loans of Austrian banks' CESEE subsidiaries ³	88,282	85,382	79,047	76,736	69,317	32,576	31,027	29,836

Source: OeNB.

¹ As of mid-2017, comparability of data with earlier figures is limited due to several methodological adjustments in data collection.² Lending (net lending after risk provisions) to nonbanks by all fully consolidated bank subsidiaries in CESEE.³ The transfer in ownership of UniCredit Bank Austria AG's CESEE subsidiaries to the Italian UniCredit Group limits the comparability of figures as of end-2016.⁴ Cross-border lending to nonbanks and nonfinancial institutions in CESEE according to monetary statistics.

Table A15

Profitability on a consolidated basis¹

	2011	2012	2013	2014	2015	2016	2017	2018
	<i>End of period, EUR million</i>							
Operating income	37,207	37,673	35,271	28,717	28,064	22,408	22,837	24,023
of which: net interest income	20,426	19,259	18,598	19,345	18,336	14,604	14,536	15,210
fee and commission income	7,592	7,260	7,590	7,741	7,730	6,562	6,885	7,097
trading income	845	1,137	670	426	-50	110	95	-628
other operating income ²	8,344	10,016	8,413	1,205	2,048	1,132	1,322	2,344
Operating expenses	26,839	25,582	27,318	19,833	17,612	16,687	14,752	15,661
of which: staff costs	10,279	10,391	10,378	9,543	8,959	8,774	8,415	8,602
other administrative expenses	6,316	6,410	6,628	6,569	6,830	5,820	5,571	5,630
Operating profit/loss	10,369	12,090	7,953	8,884	10,452	5,723	8,087	8,361
Net profit after taxes	711	2,966	-1,035	685	5,244	4,982	6,579	6,916
	%							
Return on average assets ³	0.1	0.3	0.0	0.0	0.5	0.6	0.8	0.8
Return on average equity (tier 1 capital) ³	1.7	5.1	-0.7	0.7	8.5	8.3	10.5	10.3
Net interest income to operating income	55	51	53	67	65	65	64	63
Cost-to-income ratio	66	62	73	69	63	74	65	65
Risk provisioning to operating profit	58	53	88	77	45	21	13	5

Source: OeNB.

¹ The transfer in ownership of UniCredit Bank Austria AG's CESEE subsidiaries to the Italian UniCredit Group limits the comparability of figures as of end-2016.² Since end-2014, other operating income and other operating expenses have been netted under other operating income.³ End-of-period result for the full year after tax but before minority interests as a percentage of average total assets and average tier 1 capital, respectively.

Table A16

Profitability of Austrian banks' CESEE subsidiaries^{1, 2}

	2011	2012	2013	2014	2015	2016	2017	2018
<i>End of period, EUR million</i>								
Operating income	13,195	12,685	12,544	12,159	12,261	7,752	7,914	7,925
of which: net interest income	9,402	8,780	8,414	9,068	8,431	5,135	5,304	5,467
securities and investment earnings	70	66	63	27	49	57	71	87
fee and commission income	3,091	2,992	3,164	3,477	3,358	2,184	2,315	2,241
trading income	517	739	736	-251	642	681	381	145
other operating income ³	-145	-321	-374	-831	-528	-344	-157	-15
Operating expenses ³	6,387	6,363	6,253	6,413	6,264	4,084	4,216	4,081
of which: staff costs	2,997	2,992	2,922	2,978	2,896	1,956	2,052	2,004
Operating profit/loss	6,809	6,321	6,291	5,746	5,998	3,668	3,698	3,845
Net profit after taxes	1,757	1,999	2,201	672	2,050	2,354	2,627	2,913
%								
Return on average assets ⁴	0.7	0.7	0.8	0.2	0.7	1.3	1.3	1.4
Return on average equity (tier 1 capital) ⁴	7.2	8.2	8.4	9.9	9.5	14.3	14.3	16.5
Net interest income to operating income	71	69	67	75	69	66	67	69
Cost-to-income ratio ³	48	50	50	53	51	53	53	51

Source: OeNB.

¹ Pro rata data of Yapı ve Kredi Bankası, a joint venture of UniCredit Bank Austria AG in Turkey, are included for the period from the first quarter of 2014 until end-2015.² The transfer in ownership of UniCredit Bank Austria AG's CESEE subsidiaries to the Italian UniCredit Group limits the comparability of figures as of end-2016.³ Since end-2014, other operating income and other operating expenses have been netted under other operating income.⁴ 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.

Table A17

Solvency

	2011	2012	2013	2014	2015	2016	2017	2018
<i>End of period, EUR million</i>								
Own funds	88,071	88,204	88,994	87,584	87,793	80,699	84,983	86,529
Total risk exposure	630,158	621,925	578,425	562,790	537,447	442,870	449,451	465,623
<i>End of period, eligible capital and tier 1 capital, respectively, as a percentage of risk-weighted assets</i>								
Consolidated total capital adequacy ratio	13.6	14.2	15.4	15.6	16.3	18.2	18.9	18.6
Consolidated tier 1 capital ratio	10.3	11.0	11.9	11.8	12.9	14.9	15.9	16.0
Consolidated core tier 1 capital ratio (common equity tier 1 as from 2014)	9.8	10.7	11.6	11.7	12.8	14.8	15.6	15.4

Source: OeNB.

Note: Since 2014, figures have been calculated according to CRD IV requirements; therefore, comparability with previous figures is limited.

Table A18

Market indicators of selected Austrian financial instruments

	2012	2013	2014	2015	2016	2017	2018	May 2019
Share prices	<i>% of end-2012 prices, end of period</i>							
Erste Group Bank	100	106	80	121	119	159	163	151
Raiffeisen Bank International	100	81	42	45	58	100	82	69
EURO STOXX Banks	100	126	120	114	105	116	95	77
Uniq	100	94	79	76	73	89	87	81
Vienna Insurance Group	100	90	92	63	53	64	61	54
EURO STOXX Insurance	100	133	138	160	151	165	168	166
Relative valuation: share price-to-book value ratio	<i>%, end of period</i>							
Erste Group Bank	62	82	71	95	86	106	109	95
Raiffeisen Bank International	60	51	48	50	59	100	77	62
EURO STOXX Banks	58	81	77	74	72	83	69	53
Uniq	105	103	78	74	69	86	89	78
Vienna Insurance Group	107	102	98	79	62	71	69	58
EURO STOXX Insurance	75	107	93	102	89	106	108	102

Source: Bloomberg.

Table A19

Key indicators of Austrian insurance companies

	2011	2012	2013	2014	2015	2016	2017	2018
Business and profitability	<i>End of period, EUR million</i>							
Premiums	16,537	16,341	16,608	17,077	17,342	16,920	16,975	17,178
Expenses for claims and insurance benefits	12,826	12,973	13,150	14,157	15,514	14,751	14,727	14,088
Underwriting results	295	455	592	477	475	560	581	507
Profit from investments	2,964	3,391	3,354	3,211	3,216	3,051	2,815	2,528
Profit from ordinary activities	1,162	1,395	1,524	1,421	1,354	1,414	1,244	1,168
Acquisition and administrative expenses	3,541	3,499	3,528	3,573	3,697	3,818	3,728	3,800
Total assets ¹	105,945	108,374	110,391	113,662	114,495	114,707	137,280	133,082
Investments								
Total investments	99,776	103,272	105,496	107,442	107,933	108,897	109,235	108,522
of which: debt securities	37,813	37,614	39,560	41,667	41,517	43,241	44,030	43,529
stocks and other equity securities ²	12,363	12,505	12,464	12,619	12,522	12,534	11,862	11,850
real estate	5,236	5,371	5,689	5,858	5,912	6,022	6,149	6,472
Investments for unit-linked and index-linked life insurance	15,870	18,330	19,127	20,179	19,776	20,142	20,587	19,123
Claims on domestic banks	16,405	16,872	16,687	15,800	15,492	13,793	10,313	9,728
Reinsurance receivables	1,733	1,933	824	918	971	1,027	1,036	1,116
	%							
Risk capacity² (median solvency capital requirement)	332	350	368	380	375	x	276	255

Source: FMA, OeNB.

¹ Contains shares, share certificates (listed and not listed) and all equity instruments held by mutual funds.² A new reporting system based on Solvency II was introduced in 2017; therefore, some indicators cannot be compared with historical values.

Table A20

Assets held by Austrian mutual funds

	2011	2012	2013	2014	2015	2016	2017	2018
<i>End of period, EUR million</i>								
Domestic securities	50,046	50,963	49,757	52,116	52,970	54,382	54,824	52,480
of which: debt securities	16,683	17,527	16,203	15,467	13,609	13,278	11,879	11,313
stocks and other equity securities	2,991	3,637	3,610	3,345	3,530	4,283	4,678	3,607
Foreign securities	87,458	96,854	99,647	110,397	114,833	120,330	128,836	121,038
of which: debt securities	58,695	63,661	62,972	69,642	70,326	69,911	70,353	67,956
stocks and other equity securities	12,097	14,208	16,278	17,910	18,521	20,145	22,924	20,747
Net asset value	137,504	147,817	149,404	162,513	167,802	174,712	183,661	173,518
of which: retail funds	78,299	84,158	83,238	89,163	91,626	94,113	97,095	89,923
institutional funds	59,205	63,659	66,167	73,350	76,177	80,599	86,572	83,600
Consolidated net asset value	116,747	126,831	128,444	138,642	143,249	148,682	156,173	154,235

Source: OeNB.

Table A21

Structure and profitability of Austrian fund management companies

	2011	2012	2013	2014	2015	2016	2017	2018
<i>End of period, EUR million</i>								
Total assets	661	644	670	725	745	691	674	655
Operating profit	125	111	131	158	184	157	177	177
Net commissions and fees earned	284	283	310	368	411	402	407	407
Administrative expenses ¹	195	205	219	246	266	284	267	251
Number of fund management companies	29	29	29	29	29	29	30	24
Number of reported funds	2,171	2,168	2,161	2,118	2,077	2,029	2,020	2,017

Source: OeNB.

¹ Administrative expenses are calculated as the sum of staff and material expenses.

Table A22

Assets held by Austrian pension funds

	2011	2012	2013	2014	2015	2016	2017	2018
<i>End of period, EUR million</i>								
Total assets	14,798	16,335	17,385	19,011	19,646	20,839	22,323	21,494
of which: direct investment	1,139	1,139	1,640	1,065	990	835	848	863
mutual funds	13,626	15,278	15,745	17,946	18,656	20,004	21,475	20,631
foreign currency (without derivatives)	x	5,714	5,964	7,578	7,279	9,169	n.a.	9,149
stocks	x	4,805	5,472	6,250	6,200	6,972	7,867	7,034
debt	x	8,464	7,650	9,163	9,552	9,521	9,054	9,724
real estate	x	567	583	576	690	754	1,165	978
cash and deposits	1,624	1,488	2,033	1,598	1,850	1,863	2,192	1,632

Source: OeNB, FMA.

Table A23

Assets held by Austrian severance funds

	2011	2012	2013	2014	2015	2016	2017	2018
<i>End of period, EUR million</i>								
Total direct investment	1,393	1,442	1,528	1,415	1,565	1,682	1,893	2,416
of which: euro-denominated	1,363	1,415	1,507	1,299	1,502	1,647	1,847	2,348
foreign currency-denominated	30	27	21	x	63	35	46	68
accrued income claims from direct investment	19	22	21	15	14	15	13	12
Total indirect investment	2,891	3,834	4,701	5,912	6,741	7,745	8,720	9,674
of which: total of euro-denominated investment in mutual fund shares	2,741	3,540	4,220	5,190	5,790	6,743	7,429	7,989
total of foreign currency-denominated investment in mutual fund shares	151	294	481	722	951	1,002	1,291	1,685
Total assets assigned to investment groups	4,284	5,254	6,218	7,306	8,294	9,412	10,597	1,205

Source: OeNB.

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

Table A24

Transactions and system disturbances in payment and securities settlement systems

	2011	2012	2013	2014	2015	2016	2017	2018
<i>Number of transactions in million, value of transactions in EUR billion</i>								
Large-value payment system (domestic, operated by the OeNB)								
Number	1	1	1	1	1	1	1	1
Value	7,667	9,974	5,906	7,438	6,381	4,316	3,690	1,536 ¹
System disturbances	1	1	3	0	1	4	0	3
Securities settlement systems								
Number	2	2	2	2	2	2	2	2
Value	439	418	369	377	315	335	701 ²	658
System disturbances	0	1	5	2	3	3	0	3
Card payment systems								
Number	591	633	673	856 ³	901	963	1,061	1,178
Value	45	48	72	91 ³	97	101	108	116
System disturbances	4	4	2	0	2	4	1	2
Participation in international payment systems								
Number	36	41	53	113	144	166	191	217
Value	1,306	1,820	1,643	2,463	2,420	3,029	3,242	3,831
System disturbances	0	0	0	0	0	0	0	0

Source: OeNB.

¹ As of 2018, liquidity transfers from participants' domestic accounts to their own TARGET2 accounts are no longer included in domestic transactions.² Free-of-payment (FOP) transactions were first included in the value in 2017.³ On-us ATM transactions were first included in 2014.