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EUROSYSTEM

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Security through stability.

NOVEMBER 2023

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.

Publisher and editor	*Oesterreichische Nationalbank* *Otto-Wagner-Platz 3, 1090 Vienna* *PO Box 61, 1011 Vienna, Austria* *www.oenb.at* *oenb.info@oenb.at* *Phone (+43-1) 40420-6666*
Editorial board	*Birgit Niessner, Vanessa Redak, Markus Schwaiger*
Coordinators	*Andreas Greiner, Stefan Michael Kavan*
Editing and translation	*Dagmar Dichtl, Ingrid Haussteiner, Jani Sonnleitner, Susanne Steinacher*
Layout and typesetting	*Birgit Jank, Melanie Schuhmacher*
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Content

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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.

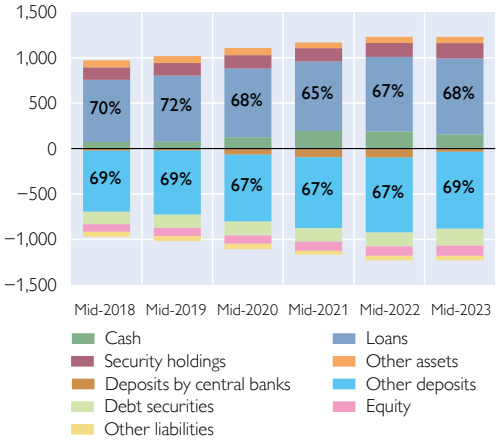
Recent developments and macroprudential policy update

The Austrian banking sector further increased its profit in the first half of 2023 despite fading momentum in loan growth

Chart 1

Consolidated balance sheet of the Austrian banking sector

Assets and liabilities, EUR billion



Source: OeNB.

Austrian banks' total assets remained at around EUR 1.2 trillion, more than 50% of which are held by the top three banking groups. Austria has around 500 banks, whose total assets equal about EUR 1.2 trillion. Nearly EUR 300 billion come from their subsidiaries in Central, Eastern and Southeastern Europe (CESEE). The consolidated balance sheet is dominated by loans and deposits (excluding central banks), which make up more than two-thirds of the sector's assets and liabilities. These shares have been stable over the last years (see chart 1). In contrast, cash balances and deposits by central banks, which had risen during the COVID-19 pandemic, started to decline recently. Despite the large number of banks, the sector is highly concentrated, with the top three banking groups accounting for more than half of total assets.

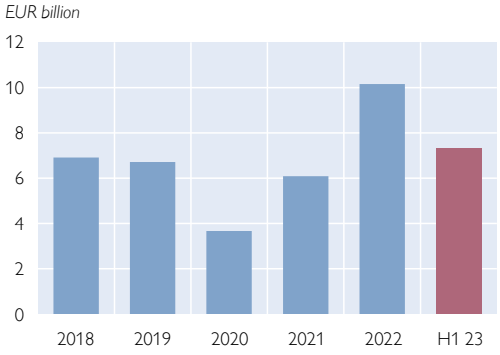
The largest banks in Austria are required to hold a capital buffer for other systemically important institutions (O-SII buffer), which reflects their role for the financial system and the wider economy. The O-SII buffer is prescribed for banks whose malfunctioning or failure may trigger a systemic risk that could entail serious negative consequences for the financial system and the real economy. Systemically important institutions in Austria are identified based on the guidelines of the European Banking Authority (EBA) by considering a bank's size and other factors such as its complexity and interconnectedness.[1] Currently, seven banks at the consolidated level and eight banks at the unconsolidated level are identified as systemically important institutions and hold an O-SII buffer between 0.5% and 1.75%. The next periodic evaluation of this buffer will take place in 2024.

The Austrian banking sector earned a record profit, mainly due to higher interest margins. Austrian banks continued to increase their profits in the first half of 2023, supported, among other things, by rising policy interest rates on deposits in riskless overnight central bank accounts. Compared to the same period last year, they more than doubled their profits to EUR 7.3 billion (see chart 2). With the net interest margin amounting to over 2%, Austrian credit institutions expanded their net interest income by more than 40% over the last 12 months. High inflation, on the other hand, also led to an increase in administrative

[1] *A detailed list of the results is published on the website of the Financial Market Stability Board (FMSB) at https://fmsg.at/en/publications/warnings-and-recommendations/2023/recommendation-fmsb-4-23.html.*

Chart 2

Net profit of the Austrian banking sector



Source: OeNB.

costs and wages in particular. Impairments on equity participations, which weighed on last year's results, no longer had a significant impact on profits, while loan loss provisioning was only marginally higher than last year.

Improved operating efficiency pushed Austrian banks' return on assets well above the European average in the first half of 2023. Rising income and lower expenses raised operating efficiency. The consolidated cost-to-income ratio of the Austrian banking sector improved to 50% in the first half of 2023. Provided that profits stay on a similar course in the second half of the year, Austrian banks will generate a consolidated return on assets of 1.3%. The comparative figure for the European banking sector would be 0.7%.

Due to rising interest rates and banks' stricter lending conditions, bank lending is losing momentum in Austria. Companies' short-term financing needs for inventories and operating resources remained at an elevated level, but demand for investment loans has been falling. In August 2023, corporate loans grew by 4.7% year on year, i.e. only at half the rate recorded at end-2022. At the same time, loans to households contracted by 1.3%, caused by a shrinking volume of mortgage loans, as increasing interest rates made the latter less affordable. In light of this, the annual growth rate of domestic loans to nonbanks declined to 1.1% in August 2023.

The credit-to-GDP gap remained negative, warranting a countercyclical capital buffer (CCyB) of 0%. The credit-to-GDP gap, which serves as the leading indicator for activating the CCyB, remained well below the critical threshold of +2 percentage points, which implied a CCyB of 0%. However, with GDP growth having proven increasingly volatile over the last few years, the credit-to-GDP gap may have become less reliable as an indicator of the buildup of cyclical risk. Consequently, supervisory authorities closely monitor additional relevant indicators that relate, for instance, to the correct pricing of risks in the financial system, the valuation of real estate markets and the indebtedness of households and corporates.

Since the introduction of binding borrower-based measures (BBMs) in Austria in August 2022,[2] residential real estate (RRE) lending standards have improved significantly. The BBMs, which are a structural macroprudential instrument, define limits for new RRE lending with respect to the loan-to-value (LTV) ratio (90%), the debt service-to-income (DSTI) ratio (40%) and loan maturities (35 years). Since the fourth quarter of 2022, the share of sustainable lending has increased for all indicators defined in the BBMs. For the

[2] *See https://www.fma.gv.at/en/fma-issues-regulation-for-sustainable-lending-standards-for-residential-real-estate-financing-kim-v.*

Chart 3

Bank loans to domestic households

Annual growth in %

Source: ECB.

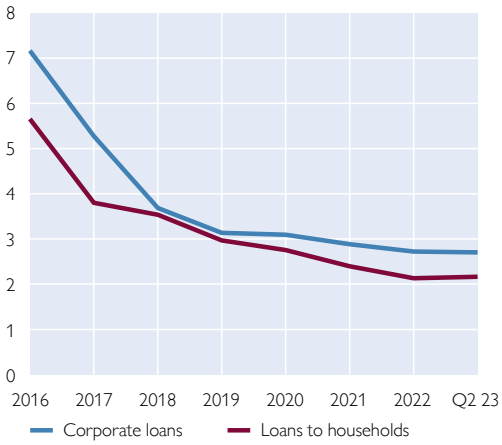
LTV ratio, the share of sustainable lending climbed from 70% to 79%. The shares of sustainable lending for the DSTI ratio and for loan maturities are even higher at 89% and 99% in the first half of 2023, which reflects an increase by 5 and 3 percentage points, respectively. Banks' flexibility increased further in 2023 due to an amendment. In addition to the exemption bucket applicable to up to 20% of the volume of new loans, bridge loans, for instance, were exempted too. According to reporting data, banks only used around two-thirds of their total exemption bucket in the first half of 2023, which suggests that the decrease in mortgage volumes is demand driven. Further evidence that BBMs were not driving the deceleration comes from a comparison with the situation in Germany, where no such measures are in place and lending growth has shown a similar downward trend (see chart 3). Against this background and considering the current environment of higher interest rates, elevated economic uncertainties and lower loan demand, a recent evaluation suggests that it is necessary to keep the BBMs in place to prevent a rise in RRE-induced systemic risk.

Lending at variable interest rates remains an area of macroprudential concern. From 2022 onward, the share of new loans to households with variable interest rates rose again, reaching close to 50% in August 2023, which exposes borrowers to interest rate risks, and such risks have already started to materialize. Interestingly, this occurs at a time when interest rates for variable rate loans are higher than for fixed rate lending. This development warrants close monitoring, as variable rate loans carry an additional indirect credit risk for the banking system.

Credit quality remains high. Rising interest rates, subdued economic conditions and an increasing number of insolvencies, which are back at pre-pandemic levels, have not yet resulted in a deterioration of Austrian banks' credit quality. This is in part because the effects of rising interest rates usually take some

Chart 4

Consolidated NPL ratio of the Austrian banking sector



Source: OeNB.

time to lead to credit defaults. Furthermore, amid lower household and corporate indebtedness, the consolidated nonperforming loan (NPL) ratio[3] remained at 2.0%. In mid-2023, the NPL ratios of corporate and household loans ran to 2.7% and 2.2%, respectively, as can be seen in chart 4. Consequently, Austrian banks kept credit risk provisioning stable year on year, and the relative cost of risk[4] at 0.2%. The consolidated coverage ratio continued to fall, however, as vintage NPLs with higher provisions were replaced by newly formed, less provisioned NPLs.

The Austrian banking sector's liquidity ratios are high and comfortably above minimum requirements. The sector's liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) are high, with the median LCR amounting to 158% and the median NSFR equaling 127% in mid-2023. Austrian banks' ratios are therefore comfortably above the minimum requirements of 100%. While reducing central bank deposits, banks' repayments of amounts borrowed under the Eurosystem's targeted longer-term refinancing operations (TLTROs) freed up collateral. In terms of liquidity ratios, Austrian banks thus match or slightly outperform the European average, while their central bank reserves still account for a major part of their liquid assets.

The capitalization of the Austrian banking sector has improved, but Austrian significant institutions (SIs) continue to trail behind their competitors. Driven by retained earnings, the Austrian banking sector's common equity tier 1 (CET1) capital rose to EUR 90 billion in the first half of 2023. The corresponding CET1 ratio stood at 16.6%. At 7.9%, the consolidated leverage ratio, which offsets the weaknesses of risk-based capital requirements, was kept nearly stable. Despite the increased capitalization, Austrian SIs still trail behind both their smaller local competitors and European SIs on average.[5] Therefore, continued efforts are needed by Austrian SIs to increase their capital base. The gradual phase-in of increased structural buffer requirements until 2024 is an important step in this direction, not least because a strong capital base is crucial in times of high inflation, sharply rising interest rates, geopolitical tensions and a subdued economic outlook.[6]

[3] *NPL ratio excluding cash balances at central banks and other demand deposits.*

[4] *Defined as loan loss provisioning over total loans.*

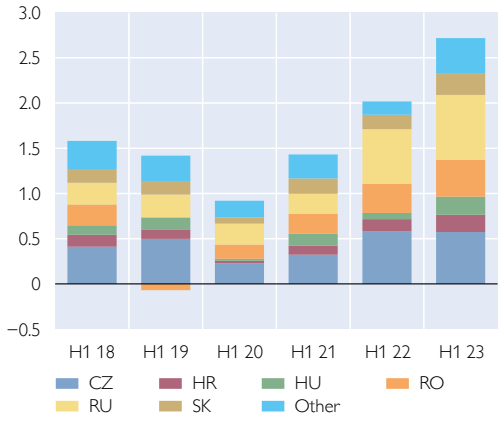
[5] *As of mid-2023, the average CET1 ratio of European SIs amounted to 15.7%, while Austrian SIs recorded an average ratio of 15.2%. See https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.supervisorybankingstatistics_second_quarter_2023_202310~f41e7f2373.en.pdf.*

[6] *To learn more about the results of the OeNB's 2023 solvency stress test, see the box at the end of this report.*

Austrian banks' activities in CESEE are concentrated in EU member states, but Russia's profit contribution continues to be considerable. With more than 80% of assets and 60% of profits originating from inside the EU, Austrian banks' CESEE subsidiaries predominantly operate within the common European framework. Nonetheless, as highlighted by chart 5, six countries have dominated profit contributions over the last years, with Russia playing a significant role, although those profits are currently not transferable.

Chart 5

Austrian banks' subsidiaries in CESEE: profit in the first half of the year

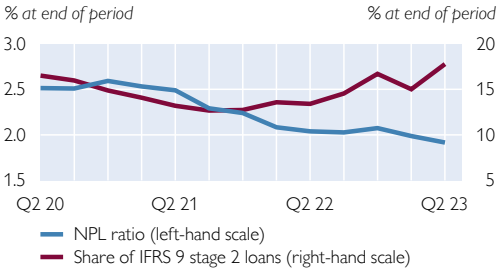


Source: OeNB.

Austrian banks' subsidiaries in CESEE earned a record EUR 2.7 billion in the first half of 2023. In a higher interest rate environment, the subsidiaries earned more than EUR 4 billion in net interest income (+16% year on year), while fees and commissions income rose by 10% to more than EUR 2 billion. Consequently, operating income amounted to EUR 6.5 billion and subsidiaries' operating profit (EUR 3.6 billion) was up by almost 20%. Very much like in Austria, credit risks have not yet materialized, despite high interest rates, a cost-of-living crisis and higher input costs for companies. The NPL ratio[7] reached a historic low of 1.9% and credit risk provisioning dropped by more than one-third year on year. The share of IFRS 9 stage 2 loans started to increase, however, which points to rising risks (see chart 6).[8] The overall positive business development is reflected in the subsidiaries' profit of EUR 2.7 billion (up more than one-third year on year) and their return on assets, which rose substantially from 1.4% in the first half of 2022 to 1.9% one year later.

Chart 6

Austrian banks' subsidiaries in CESEE: asset quality indicators



Source: OeNB.

As of mid-2023, the aggregate CET1 ratio of Austrian banks' CESEE subsidiaries stood at 18.1% (up 2 percentage points year on year). Their loan-to-deposit ratio was 71%.[9] These solid levels are a testament to past efforts by banks and supervisors to make local banking systems more resilient, by increasing the subsidiaries' risk-bearing capacity and ensuring a balanced refinancing

[7] *NPL ratio excluding cash balances at central banks and other demand deposits.*

[8] *Loans are classified in stage 2 if their "credit risk has increased significantly since initial recognition and is not considered low." For further details, see https://www.bis.org/fsi/fsisummaries/ifrs9.pdf.*

[9] *The loan-to-deposit ratio is calculated by dividing loans to nonbanks by deposits from nonbanks.*

structure.[10] The outlook for banking in CESEE remains clouded, given uncertainties related to the effects of the war in Ukraine, inflation as well as monetary policy. Hence, credit risk costs may start to rise and net interest margins might be squeezed as deposits are termed out.

The systemic risk buffer (SyRB) addresses, among other risks, the high and concentrated banking exposure to emerging economies in Europe. Disruptions in the whole or in parts of the Austrian financial system may entail severe negative consequences for the entire financial system and the real economy. The SyRB addresses structural systemic risks, inter alia the domestic banking sector's specific ownership structures and its high exposure to emerging economies in Europe. Although the SyRB is a structural buffer that is expected to stay fairly stable over time and is not affected by short-term developments, the OeNB evaluates it on a regular basis. The next evaluation will take place in 2024.

Recommendations by the OeNB

Fast rising interest rates boosted the banking sector's net interest margin and lifted profits to new highs in the first half of 2023. As banks used this momentum to improve their capitalization and thus their resilience to future risks, this development benefits financial stability. However, inflation is still too high and, consequently, monetary policy is set to stay tight. As geopolitical tensions also linger, multiple challenges persist for banks and the wider economy. Banks' currently outstanding profitability might not last, as interest margins can be expected to decrease. As a result, the OeNB recommends that Austrian banks further strengthen financial stability by taking the following measures:

- Continue to strengthen the capital base by exercising restraint regarding profit distributions.
- Adhere to sustainable lending standards for residential and commercial real estate financing.
- Ensure that interest rate risk management practices adequately reflect changes in the risk environment and that credit risk provisioning levels are conservative at the current juncture.
- For commercial real estate loans, be proactive in provisioning and use conservative collateral valuations.
- Maintain cost efficiency improvements to ensure structurally strong profitability.
- Further develop and implement strategies to deal with the challenges of new information technologies, increased cyber risks and climate change.

Box 1

Results of the OeNB's 2023 solvency stress test for Austrian banks

Background

The OeNB conducts annual stress tests for all Austrian banks under its dual mandate for banking supervision and financial stability. *The solvency stress test is designed to assess banks' resilience to adverse macroeconomic shocks and provides insights on both a bank-wide and a system-wide level. Conducted in a top-down fashion, it relies on the*

[10] *On the latter point and the Austrian supervisors' efforts, see https://www.oenb.at/en/financial-market/financial-stability/sustainability-of-large-austrian-banks-business-models.html.*

OeNB's well-established ARNIE stress testing framework, which is continuously improved. The stress test covers both significant and less significant institutions at the highest consolidated level. It focuses on risks relevant to the Austrian banking sector, including spillover effects among banks, which are particularly important for the decentralized sector. The most recent stress test is based on end-2022 data and covers the period from 2023 to 2025.

Scenarios

The adverse scenario assumes a severe macroeconomic downturn combined with a prolonged phase of elevated inflation and interest rates. *To be consistent with the recent EBA/ECB exercise, the OeNB employed the same baseline and adverse scenarios for its calculations. The baseline scenario projects cumulative GDP growth of 3.9% for the Austrian economy over the stress test horizon (2023–25). The adverse scenario assumes geopolitical tensions driving up commodity prices and causing supply shortfalls. Austrian inflation falls from 9.2% in 2023 to 3.9% in 2025 but remains above historical norms. Euro area real GDP contracts sharply with an overall negative cumulative growth rate of 5.9%. Austrian real GDP sees a slightly smaller negative cumulative growth rate of 5.3%. CESEE countries experience an average real GDP decline of around 6.5%, while Russian GDP shrinks by 14.8% over the same period. Driven by market expectations, the adverse scenario assumes that short-term interest rates rise to 4.4% in 2023 and drop to 3.5% by 2025, while EU long-term rates fall from 5.9% to 4.9%.*

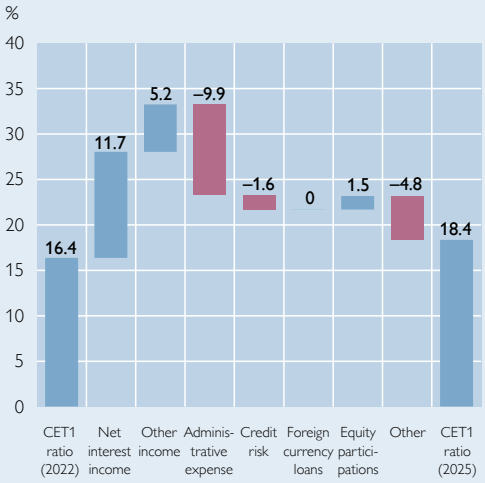
Results and risk drivers

While the aggregate CET1 ratio increases by 2 percentage points in the baseline scenario, it declines by 4.2 percentage points in the adverse scenario, landing at 12.2% at the end of 2025. *The following waterfall charts show the most important risk drivers and their contribution to capital depletion for both the baseline and the adverse scenario.*

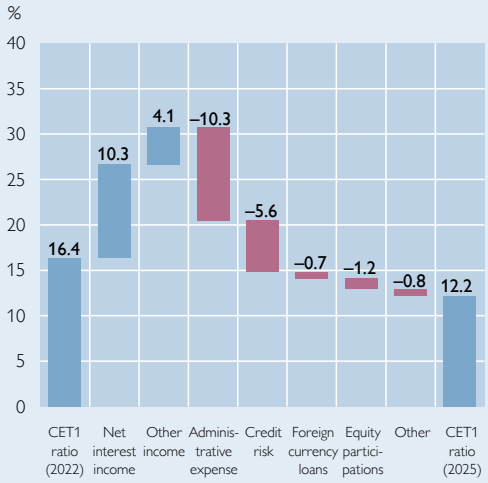
Chart 7

Austrian stress test – results and risk drivers

CET1 ratio of the Austrian banking system – baseline scenario



CET1 ratio of the Austrian banking system – adverse scenario



Source: OeNB.

Credit risk remains the main risk driver and reduces capital by 5.6 percentage points in the adverse scenario (baseline: –1.6 percentage points). Gains and losses from equity participations in nonfinancial corporations and especially other banks are significant as well. In the baseline scenario, banks participate in the profits of entities they are invested in and build up

capital (+1.5 percentage points). However, the picture reverses in the adverse scenario (–1.2 percentage points), reflecting reduced dividend income and the revaluation of equity participations. Finally, the contribution of net interest income drops from 11.7 percentage points in the baseline to 10.3 percentage points in the adverse scenario, a decline driven by a lower net interest margin. While banks profit from higher interest rates on the asset side in the adverse scenario, this effect is more than offset by higher interest costs on deposits.

The changed environment of high inflation and high interest rates results in a milder stress test impact than last year, mainly driven by higher net interest income (+2.2 percentage points) and its underlying assumptions. *In both scenarios, banks benefit from rising interest rates as assets generally reprice faster than deposits, where rates are stickier. The stress test assumes that under stressed conditions, deposit rates will rise faster than usually as customers ask for higher rates more actively. The assumptions for this pace of adjustments (the pass-through of interest rates to deposit rates, i.e. "deposit betas") are a major driver for the net interest income projections. For the stress test, the pass-through is calibrated based on OeNB research[11] and empirical observations, which indicate that household deposits show a lower pass-through than corporate deposits, while financial and other deposits reprice faster. The stress test therefore differentiates pass-through rates across scenarios, customer classes and over time. While baseline rates increase steadily over the stress test horizon, the adverse scenario assumes a steeper increase of the pass-through in the first four quarters, which overall leads to a lower net interest income compared to the baseline. Note that stress test results display a pronounced sensitivity to the underlying pass-through assumptions. The calibration of the pass-through rates taken from last year's stress test would result in a CET1 ratio of 10.2 percentage points in the adverse scenario, i.e. the impact on capital would be 2 percentage points larger.*

Conclusions

Overall, the stress test results indicate that the Austrian banking system is well placed to withstand substantial macroeconomic shocks. *The economic outlook in the baseline scenario is more optimistic than the current economic situation. In addition, higher interest rates result in a better overall performance, while the contribution of credit risk losses remains roughly unchanged. The results vary across the Austrian banking system. Banks with a larger exposure to the CESEE region experience greater losses, participation risks in the decentralized sector affect banks differently and banks with less favorable balance sheet structures benefit less from rising interest rates.*

The stress test underlines the importance of a well-capitalized banking sector. Even if capital ratios remain significantly above those observed before the great financial crisis of 2007–2008, macroeconomic uncertainty remains high. Given the speed of recent interest rate increases and the fact that many risk models were calibrated on low interest rates, potential long-term negative effects, e.g. higher credit risk losses, could still materialize. Therefore, it is important that Austrian banks act in a forward-looking and prudent manner with regard to profit distributions.

[11] *See the study by Breyer, Girsch, Hanzl, Hübler, Steininger and Wittig in this issue of the Financial Stability Report.*

Special topics

Nontechnical summaries in English

The effects of cost-push inflation on Austrian banks

Christian Wipf

This study examines how cost-push inflation resulting from import price shocks, e.g. due to higher energy prices, affected the Austrian economy and banking sector during the current high inflation period (2021 to 2023). It finds that the import price shocks were responsible for an 8% rise in Austrian consumer prices, a 1% drop in Austrian GDP and a 180 basis point increase in interest rates following central bank reactions to higher inflation in this period. In the Austrian banking sector, the cost-push inflation shocks, on the one hand, drove up banks' staff costs, administrative expenses and risk provisions (e.g. for credit risks) as inflation and interest rates went up. On the other hand, they also increased banks' income (net interest income, fees and commissions income). Net interest margins, for instance – that is, the difference between interest income and expenses as a share of total assets – are estimated to be 25 basis points higher for small banks and 14 basis points higher for large banks in the period under observation due to cost-push inflation. The net effect on bank profitability depends on a bank's size. For small banks, cost push-inflation drove up costs and risk provisions more than income, causing the return on assets (ROA) from 2021 to 2023 to be 35 basis points lower than without cost-push shocks. For large banks, the shocks led to smaller increases in costs and risk provisioning, resulting in a ROA that was 13 basis points higher in the same period.

Repricing of bank assets and liabilities in the current rate hike cycle: historical perspective and impact on bank profitability

Peter Breyer, Stefan Girsch, Jakob Hanzl, Mario Hübler, Sophie Steininger, Elisabeth Wittig

Having been low or even negative for several years, interest rates have been rising significantly since mid-2022. The banking sector benefited from this development, with Austrian banks making higher profits. In July 2023, the average overnight deposit rate in Austria was higher than the euro area average. For loans, however, both the interest rate level and pass-through rate are also higher in Austria. This is especially true for consumer loans. In sum, Austrian banks' credit spreads widened faster in the current rate hike cycle than the euro area average. We find low cumulative betas – that is, a slow pass-through of the policy rate to deposit rates – for overnight deposits and higher betas for new term deposits. One of the main reasons for the historically low betas observed in the current cycle is the excess liquidity in the market. Finally, we find that interest rates are passed on to depositors at a slower rate during times of increasing interest rates than during times of declining interest rates. Bank profitability went up in the current rate hike cycle. In light of macroeconomic uncertainties and potentially rising credit risk costs, banks should use their profits to further strengthen their capital position.

Austria's deposit guarantee scheme – resilient in uncertain times

Judith Eidenberger, Katharina Steiner

Austria's deposit guarantee scheme (DGS) is multilayered, consisting of three separate DGSs. Despite this complex structure, the Austrian DGSs managed four deposit insurance cases effectively between 2020 and 2022. Despite the systemic dimension of the related payouts in times of exceptional macroeconomic uncertainty and although uncovered depositors incurred losses, the Austrian DGSs have remained credible, and the payout cases had no significant negative effects on banks or financial stability. Our study identifies three key aspects that helped maintain the credibility of Austria's DGSs: (1) a well-functioning setup combined with a clear funding structure, (2) the efficient operational management of the payouts and (3) the superiority of the DGSs vis-à-vis other creditors in the distribution of insolvency assets combined with sound insolvency procedures.

What do people in Austria think about green finance?

Andreas Breitenfellner, Heider Kariem

This paper analyzes the results of the 2022 OeNB Barometer survey, which asked households in Austria about their opinions and knowledge about green finance. Put simply, green finance is any financial activity, product or service that contributes to sustainable development. We find that a majority expects that due to climate change, they will be financially worse off in 15 years' time. At the same time, respondents seem to have mainly positive opinions and attitudes about green financial products and businesses. This is especially true for women as well as people who have a higher level of education and middle incomes and who are able to save more. By contrast, age, job status, town size and financial literacy appear to play a rather minor role. We also see that despite positive attitudes, there is low interest in buying green financial products – a finding that matches those of comparable Austrian and international studies. Only relatively few respondents seem to be prepared to do a certain amount of research on green investments and even accept lower returns. That said, contradictory answers suggest that some respondents struggle to understand green finance and related concepts. We also see skepticism about the credibility of financial products marketed as sustainable: A majority thinks that the financial sector deceives the public, cultivating an image of sustainability only to maximize profits ("greenwashing"). As greenwashing can undermine the trust of (potential) customers and may consequently jeopardize confidence in the financial sector and financial stability, it is an issue that financial supervisors should address.

Nontechnical summaries in German

Die Auswirkungen angebotsseitiger Inflation auf die österreichischen Banken

Christian Wipf

Diese Studie untersucht, wie sich die von Importpreisschocks – z. B. aufgrund höherer Energiepreise – ausgelöste Inflation von 2021 bis 2023 auf die österreichische Wirtschaft und den Bankensektor ausgewirkt hat. Die Studie zeigt, dass die Importpreisschocks zu einem Anstieg der österreichischen Verbraucherpreise um 8 %, einem Rückgang des österreichischen BIP um 1 % und – infolge der Reaktion der Zentralbanken auf die höhere Inflation – zu einer Steigerung der Zinssätze um 180 Basispunkte geführt haben. Im österreichischen Bankensektor haben die Schocks sowohl zu einem Anstieg der Kosten (Personal- und Sachaufwand sowie Risikokosten) als auch zu einem Anstieg der Erträge (Nettozinserträge und Provisionserträge) geführt. Die Nettozinsmargen – d. h. die Differenz zwischen Zinsertrag und -aufwand im Verhältnis zur Bilanzsumme – waren beispielsweise aufgrund der Inflation im Beobachtungszeitraum bei kleinen Banken um 25 Basispunkte und bei den Großbanken um 14 Basispunkte höher. Der Nettoeffekt der Inflation auf die Profitabilität der Banken hängt von der Bankengröße ab. Bei kleineren Banken stiegen die Kosten von 2021 bis 2023 stärker als die Erträge, d. h. die Inflation führte zu einer um 35 Basispunkte niedrigeren Gesamtkapitalrendite. Bei den Großbanken stiegen die Kosten aufgrund der Schocks geringfügiger an, d. h. die Inflation führte im selben Zeitraum zu einer um 13 Basispunkte höheren Gesamtkapitalrendite.

Weitergabe von Zinsschritten bei Krediten und Einlagen im aktuellen Umfeld steigender Zinsen: historischer Rückblick und Auswirkungen auf die Profitabilität der Banken

Peter Breyer, Stefan Girsch, Jakob Hanzl, Mario Hübler, Sophie Steininger, Elisabeth Wittig

Nach einigen Jahren mit niedrigen beziehungsweise sogar negativen Zinsen sind die Zinsen seit Mitte 2022 deutlich angestiegen. Dies wirkte sich auf den Bankensektor positiv aus: Die österreichischen Banken erzielten höhere Gewinne. Der durchschnittliche Zinssatz für täglich fällige Einlagen in Österreich war im Juli 2023 höher als im Durchschnitt des Euroraums. Allerdings ist in Österreich auch bei Krediten das Zinsniveau höher und die Weitergabe der Zinserhöhungen rascher als im Euroraum-Durchschnitt. Das gilt insbesondere für Konsumkredite. Insgesamt sind die Kreditmargen der österreichischen Banken im derzeitigen Umfeld steigender Zinsen deutlicher gestiegen als im Euroraum-Durchschnitt. Die Ergebnisse der Studie zeigen niedrige kumulative Betas (d. h. eine langsame Weitergabe der steigenden Leitzinsen bei Einlagen) für täglich fällige Einlagen und höhere Betas für neue gebundene Einlagen. Ein wesentlicher Grund für die langsame Zinsweitergabe ist die Überliquidität am Markt. Zuletzt zeigt die Studie, dass Zinsänderungen auf der Einlagenseite in einem Umfeld steigender Zinsen langsamer weitergegeben werden als in einem Umfeld fallender Zinsen. Die Profitabilität der Banken ist seit Beginn der Zinsanhebungen gestiegen. Vor dem Hintergrund makroökonomischer Unsicherheiten und potenziell steigender Kreditrisikokosten sollten die Banken die Gewinne nutzen, um ihre Kapitalausstattung weiter zu stärken.

Das österreichische Einlagensicherungssystem – belastbar in unsicheren Zeiten

Judith Eidenberger, Katharina Steiner

Die österreichische Einlagensicherung besteht aus drei separaten Einlagensicherungssystemen. Trotz dieser Komplexität konnten zwischen 2020 und 2022 vier Einlagensicherungsfälle erfolgreich abgewickelt werden. Dies gelang ohne signifikante negative Auswirkungen auf Banken und Finanzstabilität, obwohl die entsprechenden Auszahlungen in Zeiten außergewöhnlicher gesamtwirtschaftlicher Unsicherheit systemisch relevant waren und bei ungesicherten Einlagen Verluste verzeichnet wurden. Das Vertrauen in die österreichische Einlagensicherung blieb weiterhin aufrecht. In dieser Studie konnten drei wesentliche Faktoren für die Glaubwürdigkeit der österreichischen Einlagensicherung ermittelt werden: (1) der gut funktionierende Aufbau und die klare Finanzierungsstruktur, (2) die gute operative Durchführung der Auszahlungen und (3) die Vorrangigkeit der Einlagensicherung gegenüber anderen Gläubigern bei der Verteilung der Insolvenzmasse, gepaart mit einem soliden Insolvenzverfahren.

Was halten die Menschen in Österreich von Green Finance?

Andreas Breitenfellner, Heider Kariem

In dieser Studie analysieren wir die Ergebnisse der OeNB-Barometer-Umfrage 2022, bei der die Meinung und das Wissen österreichischer Haushalte zum Thema Green Finance erhoben wurden. Der Begriff Green Finance bezeichnet – vereinfacht ausgedrückt – jegliche Aktivitäten, Produkte und Dienstleistungen im Finanzsektor, die zu einer nachhaltigen Entwicklung beitragen oder zumindest die Risiken einer nicht nachhaltigen Entwicklung berücksichtigen. Laut den Ergebnissen der vorliegenden Umfrage geht eine Mehrheit davon aus, dass sich ihre finanzielle Situation in den nächsten 15 Jahren aufgrund des Klimawandels verschlechtern wird. Gleichzeitig haben die Befragten überwiegend eine positive Meinung bzw. Einstellung zu grünen Finanzprodukten und Unternehmen. Dies ist insbesondere unter Frauen sowie Menschen mit höherem Bildungsniveau, mittlerem Einkommen bzw. ausgeprägterem Sparverhalten zu beobachten. Andererseits dürften Faktoren wie Alter, Beschäftigungsstatus, Größe der Wohngemeinde und Finanzbildung in dieser Hinsicht eine eher geringe Rolle spielen. Ferner zeigt unsere Analyse, dass ungeachtet der positiven Einstellung gegenüber grünen Finanzprodukten das konkrete Interesse, in solche zu investieren, noch gering ist; dieses Ergebnis deckt sich mit jenen vergleichbarer österreichischer und internationaler Studien. Nur ein relativ kleiner Teil der Befragten scheint bereit zu sein, aktiv Informationen über grüne Investitionen einzuholen oder gar geringere Erträge in Kauf zu nehmen. Allerdings deuten zum Teil widersprüchliche Antworten darauf hin, dass einige der Befragten Schwierigkeiten haben, Green Finance und damit zusammenhängende Begriffe zu verstehen. Skepsis herrscht gegenüber als nachhaltig beworbenen Finanzprodukten: Eine Mehrheit ist der Meinung, dass der Finanzsektor nur zur Gewinnmaximierung ein Nachhaltigkeitsimage pflegt („Greenwashing“). Da Greenwashing das Vertrauen (potenzieller) Kund:innen und somit das Vertrauen in den Finanzsektor und die Finanzstabilität untergraben kann, sollten sich die Finanzaufsichtsbehörden mit diesem Thema befassen.

The effects of cost-push inflation on Austrian banks

Christian Wipf[1]

To better understand what the current inflationary surge means for financial stability, this study analyzes how cost-push inflation resulting from import price shocks affected key Austrian macroeconomic variables during the current high inflation period (Q2 21 to Q1 23). Broadly in line with the expectable effects of a negative supply shock, the import price shocks are estimated to have caused an 8% rise in Austrian consumer prices, a 1% drop in Austrian GDP and a 180 basis point increase in interest rates following central bank reactions to higher inflation. The effects on Austrian banks' income statements are more nuanced. On the one hand, the inflationary shocks drove up costs (staff costs and administrative expenses) and banks' risk provisions; on the other hand, they also caused banks' income to rise (net interest income and income from fees and commissions). Net interest margins, for instance, are estimated to be 25 basis points (14 basis points) higher for small (large) banks in the period from 2021 to 2023 due to cost-push inflation. The net effects on bank profitability turn out to be heterogenous. For small banks, cost push-inflation drove up costs and risk provisions more than income, causing the return on assets (ROA) to be 35 basis points lower in the period from 2021 to 2023. For large banks, the shocks led to smaller increases in costs and risk provisioning, resulting in a ROA that was 13 basis points higher in the same period.

JEL classification: E31, E44, G21, Q43
Keywords: cost-push inflation, import prices, banks, Austria

Since mid-2021, inflation has spiked in Europe but also globally, reaching double-digit levels not seen since the 1970s. What does this inflationary surge mean for financial stability? This study approaches this question by analyzing how supply-side, cost-push inflation from the import side (e.g. through higher prices for energy imports or supply bottlenecks) affected the Austrian economy and key components of Austrian banks' income statements during the current high inflation period (Q2 21 to Q1 23). Banks are the most significant actors in the Austrian financial sector, and imported cost-push inflation was one of the main sources of the current inflationary spike.[2]

This paper follows similar studies on the effects of terms-of-trade, import or oil price shocks on macroeconomic aggregates.[3] It is structured as follows: Section 1 identifies inflationary cost-push shocks from the import side. Section 2 estimates the effects of such shocks on Austrian macroeconomic variables (GDP, CPI inflation and short-term interest rates) to clarify the macroeconomic scenario. Finally, section 3 estimates the effects of these shocks on key components of Austrian

[1] *Oesterreichische Nationalbank, Financial Stability and Macroprudential Supervision Division, christian.wipf@oenb.at.* *Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the OeNB or the Eurosystem. I would like to thank my colleagues Andreas Greiner, Manuel Gruber, Martin Guth, Stefan Kavan, Stefan Kerbl, Vanessa Redak, Stefan Schmitz, Richard Sellner, Alexandra Schober-Rhomberg, Markus Schwaiger and the other members of the editorial committee of the Financial Stability Report (all OeNB) for helpful comments and valuable suggestions.*

[2] *This ignores demand-driven inflationary factors like government spending programs during the COVID-19 pandemic.*

[3] *On terms-of-trade shocks and import price shocks, see Schmitt-Grohe and Uribe (2018) and Juvenal and Petrella (2019); on oil price shocks, see Kilian (2008), Bjornland et al. (2018) and Kaenzig (2021).*

banks' income statements. All models employed in this study are estimated using data up until Q4 19 only, given the extreme effects of the COVID-19 pandemic,[4] and are then applied to the current high inflation period in Austria. Since the transmission of import price shocks to macroeconomic and bank variables takes time, all models are estimated with lags of up to two years.

1 Shock identification

To identify the import price cost-push shocks, I follow Bjornland et al. (2018) and estimate the following bivariate vector autoregression (VAR) model with quarterly world GDP growth, *GDP*, as measured by the seasonally adjusted GDP of all OECD countries, and import price growth, *comm*, as measured by the Hamburg Institute of International Economics (HWWI) commodity price index for Europe, for Q4 78 to Q4 19.[5]

$$GDP_t = c_1 + a^y_{y,1}\, GDP_{t-1} + a^\pi_{y,1}\, comm_{t-1} + \varepsilon_{y,t}$$
$$comm_t = c_2 + a^y_{\pi,0}\, GDP_t + a^y_{\pi,1}\, GDP_{t-1} + a^\pi_{\pi,1} comm_{t-1} + \varepsilon_{\pi,t}$$

The idea behind this VAR is to disentangle the demand and supply factors behind commodity prices since they impact macroeconomic variables very differently. For instance, a positive shock to global demand ε_y should drive up GDP, while a positive supply shock ε_π, e.g. due to supply restrictions following a conflict or war, should cause GDP to decrease. To identify the supply-side commodity price shocks ε_π, the VAR assumes that import prices can react directly to changes in world demand but that world demand reacts to changes in prices with a one-quarter lag.

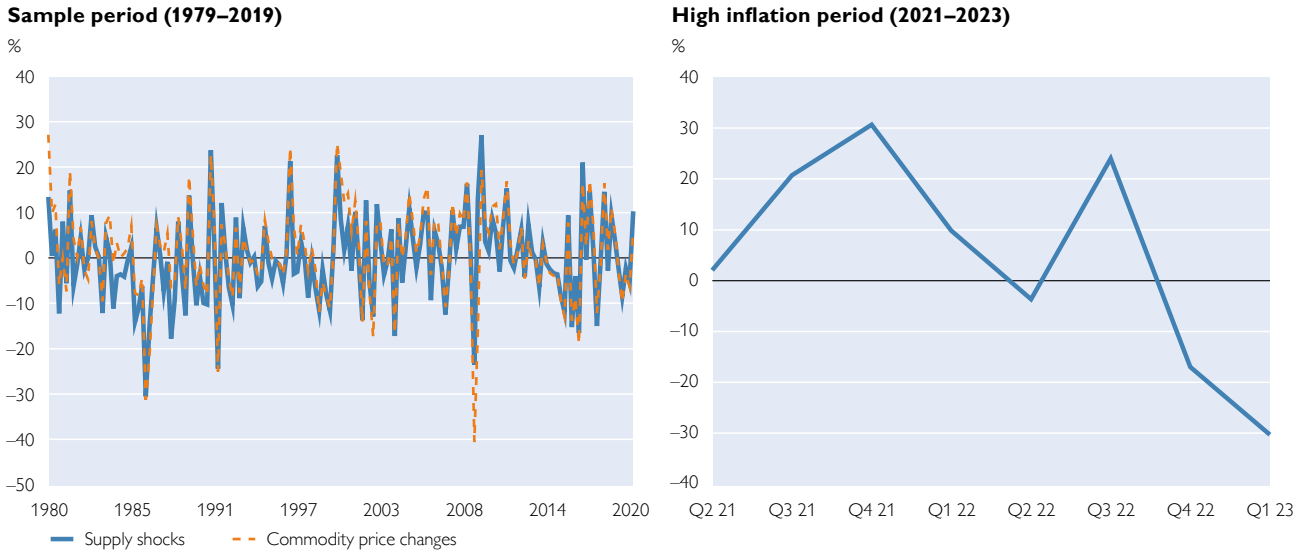
Chart 1 shows the VAR model estimates of the supply shocks $\varepsilon_{\pi,t}$ and the actual commodity price changes. As the left-hand panel indicates, cost-push shocks explain most of the changes in actual commodity prices. The right-hand panel also shows the model-implied shocks for the high inflation period from Q2 21 to Q1 23. The cost-push shocks were particularly strong in the second half of 2021 and in the first quarter of 2022.

[4] *For example, Austrian GDP in Q2 20 contracted by 11.4% before bouncing back by the same extent in Q3 20. These extreme values lead to macroeconomic effects that are at odds with findings from other studies and thus bias the results for bank variables.*

[5] *Using other import price measures, such as industry import prices, leads to very similar results. The same holds for using real commodity prices deflated by the OECD consumer price index (CPI).*

Chart 1

Commodity price changes and supply shocks



Source: HWWI, OECD, author's calculations.

2 Macroeconomic effects

To better understand the macroeconomic scenario in which the banking sector operates with imported cost-push inflation, I first regress the import price shocks ε_π identified in section 1 on key Austrian macroeconomic variables with lags of eight quarters or two years:

$$y_t = \beta_0 + \sum_{h=0}^{8} \beta_{h+1} \varepsilon_{\pi,t-h} + u_t \qquad (1)$$

The following table summarizes the macroeconomic variables y used in the regression:

Macroeconomic variables used in this study

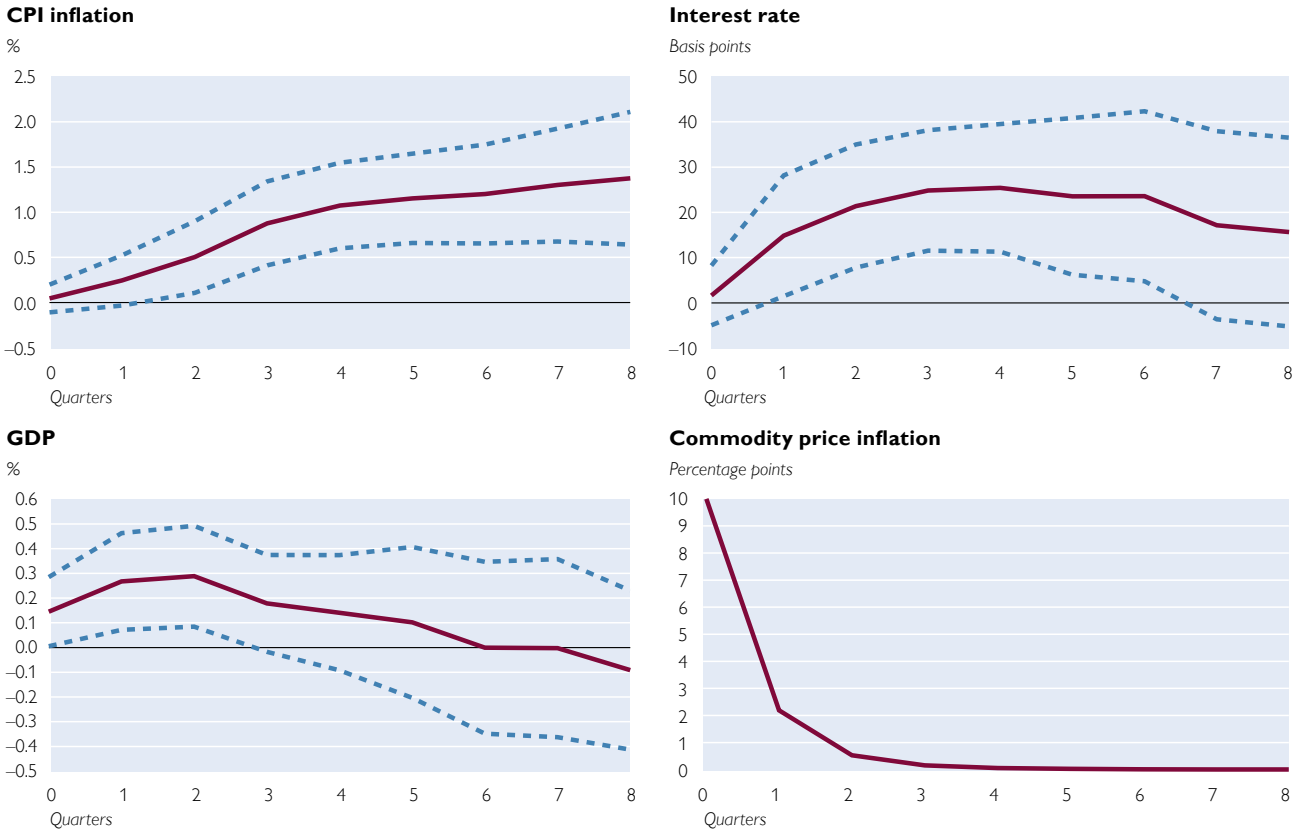
	Description of variable	Period	Source
CPI inflation	Yearly change in Austrian consumer price index in %	Q1 93 to Q4 19	Statistics Austria
Interest rate	Quarterly change in euro area three-month interbank rate in basis points	Q1 94 to Q4 19	OECD; FRED[1]
GDP	Quarterly Austrian GDP growth in %, seasonally adjusted	Q2 95 to Q4 19	Statistics Austria

Source: Author's compilation.

[1] *FRED = Federal Reserve Economic Data database (series ID:IR3TIB01EZM156N).*

Chart 2

Impulse response functions of Austrian macroeconomic variables after a cost-push inflation shock



Source: Author's calculations.

Note: The red line shows the impulse response of the macroeconomic variables. The dashed blue lines mark the 90% confidence bands that result when we use the Newey-West correction for serial correlation with a truncation parameter of 4.

Chart 2 shows the reactions of these variables after a supply shock initially increased commodity prices by 10 percentage points, as shown in the bottom right-hand panel, over the following two years (eight quarters).[6]

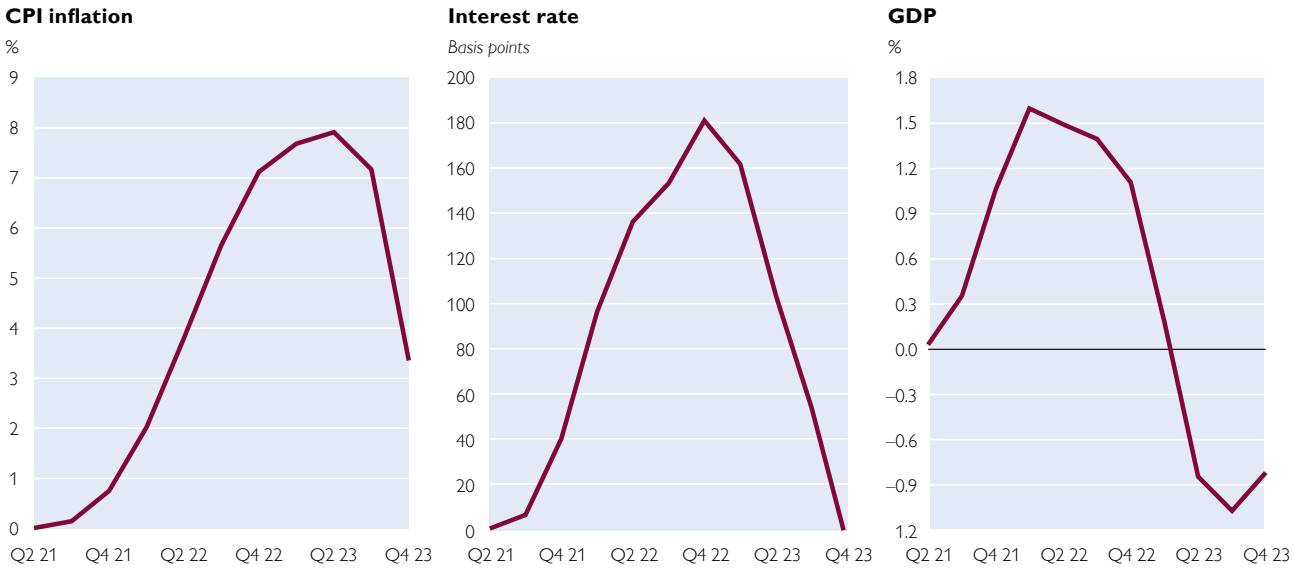
The other panels show that such a shock increases consumer prices by 1.3% and short-term interest rates – through central bank reactions – by about 20 basis points in the course of two years. After an initial rise, GDP finally decreases by 0.1% after a period of two years.

Chart 3 applies the model to the current high inflation period. It shows the marginal effects of the cost-push inflation shocks of the period from Q2 21 to Q1 23 on the three macroeconomic variables until Q4 23, i.e. it shows how the variables would have developed if they had only been affected by the cost-push shocks of the high inflation period.

[6] *To be precise, the charts show the cumulative effects, i.e. the sum of the dynamic coefficients in regression (1). Shocks of this magnitude are commonly analyzed in the literature and are close to the shocks' standard deviation of 9.4%. The effects on commodity prices are shown as deviations from their steady-state values.*

Chart 3

Macroeconomic effects of cost-push inflation shocks in Austria in the high inflation period



Source: Author's calculations.

The model suggests that the shocks caused Austrian consumer prices to rise by about 8%, interest rates to increase by 180 basis points and GDP to decline by about 1%. Given the long lags in the effects on GDP, however, this decline is not expected to materialize until mid-2023. These results are broadly in line with the expected effects of an imported negative supply shock: Higher energy and commodity prices should lead to a rise in production costs and inflation, reduce output and increase interest rates as central banks react to rising inflation.[7] The results are also broadly in line with actual data. Actual inflation increased by 8.0 percentage points between Q2 21 and Q1 23 while the model predicts a rise in inflation by 7.7 percentage points. However, the model underestimates the actual interest rate increase. Actual interest rates rose by 317 basis points between Q2 21 and Q1 23, while the model only predicts an increase by 161 basis points. This is no surprise as the current interest rate hikes were exceptionally strong by historical standards.[8]

[7] *Other papers tend to find similar effects on interest rates, while the effects on inflation (output) tend to be smaller (bigger). Kaenzig (2021) and Bjornland et al. (2018) estimate that a similar shock to oil prices drives up US inflation by 20 basis points to 40 basis points and interest rates by 10 basis points to 20 basis points. In a recent review on the macroeconomic effects of oil and energy price shocks, Bjornland (2022) estimates that a 10% oil supply shock (e.g. due to conflicts and/or war) on average reduces real GDP in the euro area by 0.5% over the same horizon. Kaenzig (2021) and Bjornland et al. (2018) arrive at similar figures for the United States.*

[8] *The effects on GDP are difficult to compare to actual data since GDP is affected by many other factors and follows a trend.*

3 Effects on banks

Like in regression (1), we now regress the import price shocks ε_π on key Austrian bank variables in an unbalanced panel regression, where $\Delta x_{i,t}$ are the bank variables of interest for bank i in first differences.[9]

$$\Delta x_{i,t} = \beta_0 + \sum_{h=0}^{8} \beta_{h+1} \varepsilon_{\pi,t-h} + u_{i,t} \quad (2)$$

The bank variables stem from the quarterly income statements of Austrian banks at the unconsolidated level, i.e. excluding foreign subsidiaries. The data cover 98 quarters, from Q4 98 until Q4 19. I focus on six key bank variables, all expressed as margins in relation to total assets: net interest margin (NIM), fees and commissions income, staff costs, administrative expenses, risk provisions (mainly for credit risk) and net profits after tax, i.e. return on assets (ROA). To mitigate the effect of large outliers, I exclude all values below the first and above the 99th percentile and omit banks with only one observation.[10] To account for the heterogeneity between banks, the results below will be presented for two groups of banks, namely small and large banks. Small banks are defined as banks holding 0.1% or less of aggregate total assets in a given period, while large banks hold 1% or more. With aggregate total assets of around EUR 1,000 billion (in 2022, average total assets were EUR 1,030 billion), this means large banks have a balance sheet of EUR 10 billion or more, and small banks have a balance sheet of EUR 1 billion or less.[11]

Chart 4 and chart 5 show the reactions of the bank variables to the same supply shock that initially increased commodity prices by 10 percentage points over the following two years (eight quarters). They provide five main takeaways: First, except for large banks where administrative expenses hardly react, the inflationary shock tends to increase banks' staff costs and administrative expenses. This is consistent with the idea that cost-push inflation increases input prices and wages. Second, the fees and commissions income of both groups of banks also goes up, suggesting that banks can pass part of the cost increases on to customers. Third, cost-push inflation shocks tend to improve Austrian banks' NIM. This is consistent with the view that banks can pass on most of the interest rate increases to their borrowers due to the high share of variable rate loans. In contrast, customer deposits, especially those of households, are rather insensitive to interest rate changes, which means deposit repricing is slow.[12] Fourth, the inflation shock drives

[9] *The regressions also include quarterly dummies to control for seasonal patterns not shown here. First differencing mitigates stationarity issues and controls for bank-specific time-invariant factors. Including bank fixed effects has practically no influence on the coefficient estimates and only slightly improves the standard errors.*

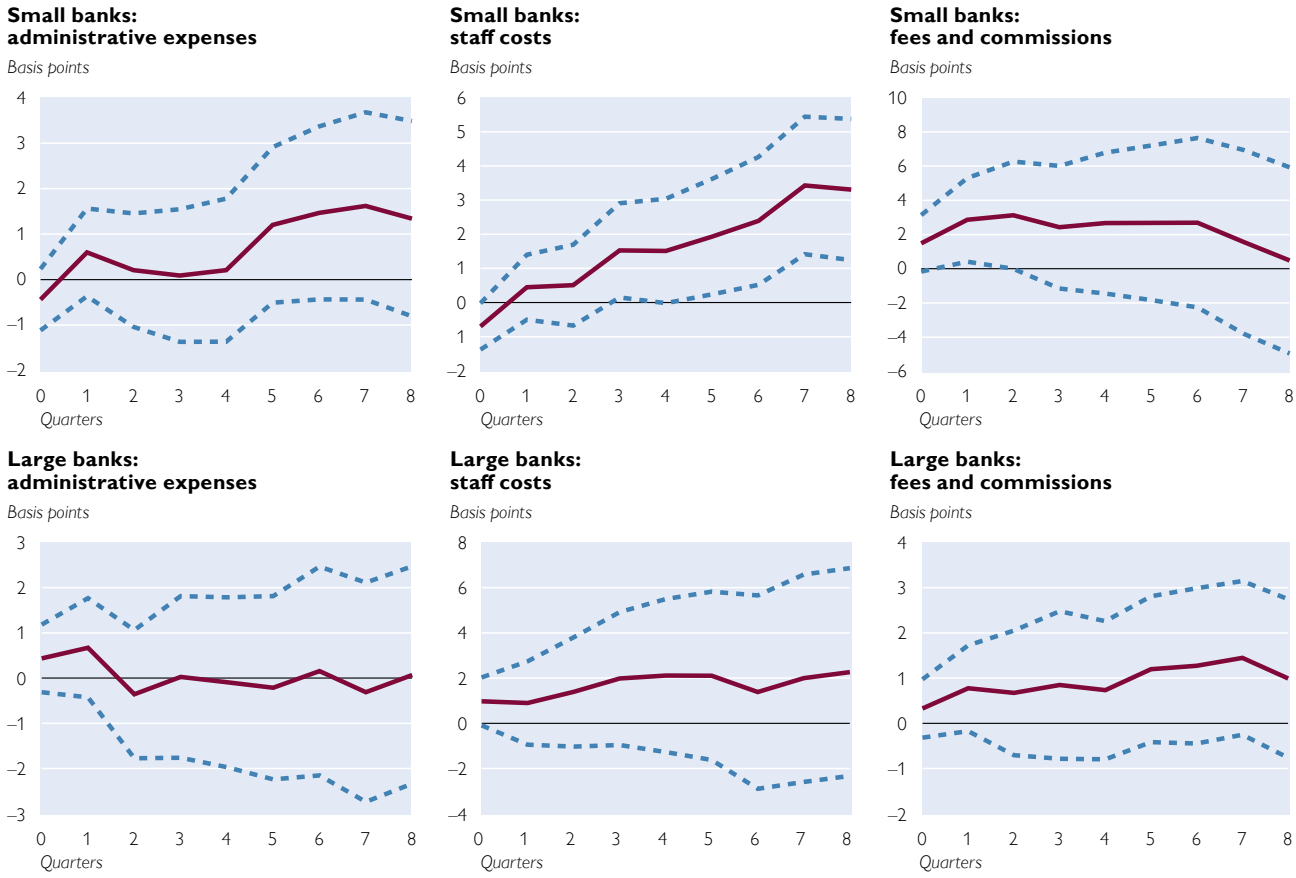
[10] *To give a concrete example: For the NIM, excluding values below the first and above the 99th percentile means excluding values below −0.37% and above 4.34%. Nine banks have only one observation.*

[11] *Note that this definition differs from the size criterion of EUR 30 billion defined for significant banks by the Single Supervisory Mechanism. Small banks account for 88.9% of observations and for 13.9% of total assets, while large banks account for 65.2% of total assets but only for 2.3% of observations. The number of large banks varies between 13 and 21 per period, without exhibiting any clear time trend, while the number of small banks decreases in parallel with the total number of banks over the sample period, from 844 (914) to 438 (538). More detailed statistics on the two groups of banks can be found in the annex.*

[12] *Hoffmann et al. (2018) investigate these arguments in more detail for the euro area.*

Chart 4

Impulse response functions of Austrian bank variables after a cost-push inflation shock



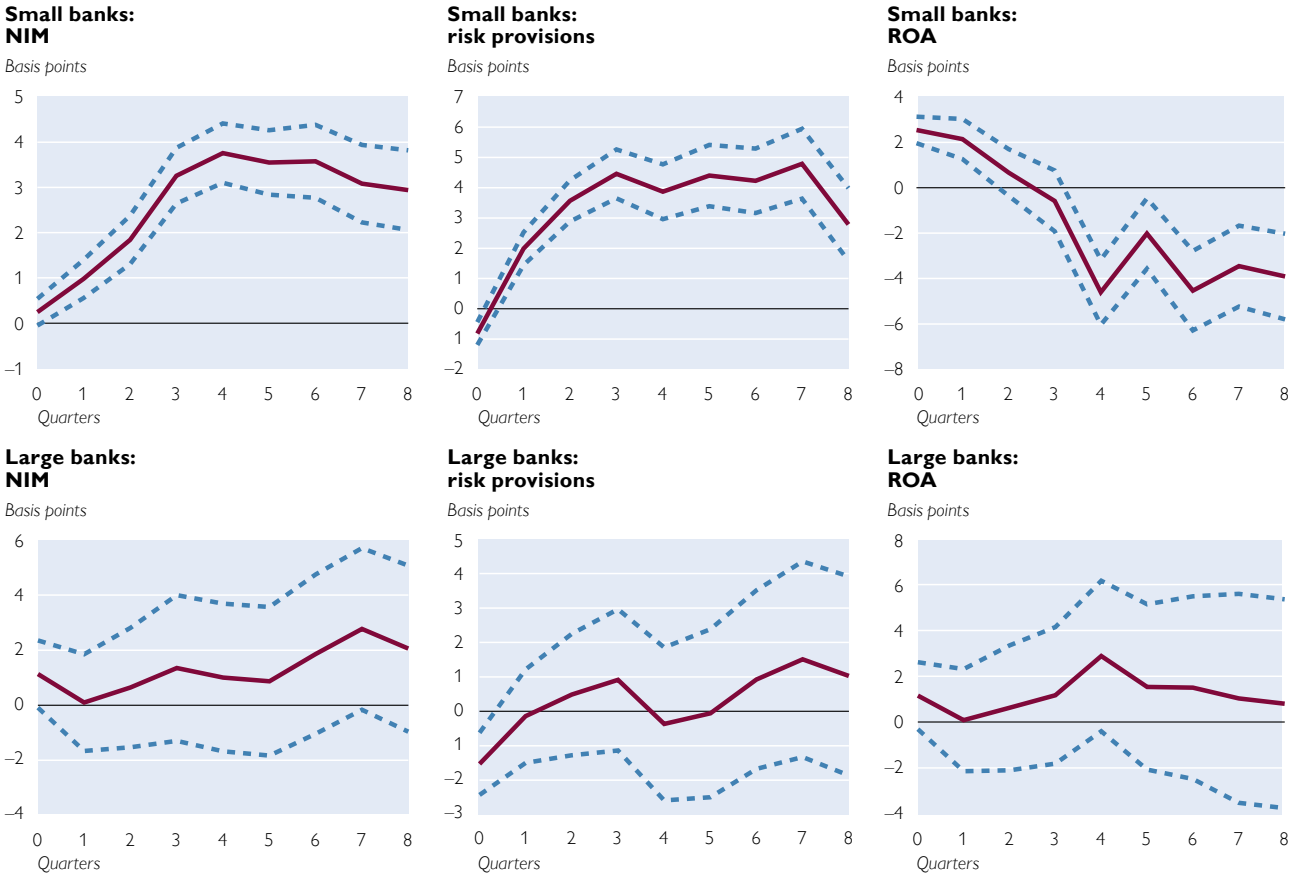
Source: Author's calculations.

Note: The red line shows the impulse response of the bank variables. The dashed blue lines mark the 90% confidence bands that result when we use the Newey-West correction for serial correlation with a truncation parameter of 4.

up bank risk provisions, which is consistent with the idea that higher inflation, higher interest rates and lower growth tend to increase credit and market risk. Fifth, the overall effect on banks is heterogenous: While the overall profitability of an average small bank tends to go down after the inflationary shock, the effect on the overall profitability of an average large bank is slightly positive. For small banks, rising costs and higher risk provisions outweigh increasing net interest margins and fees and commissions income. For large banks, smaller cost increases and smaller risk provisioning turn the balance the other way.

Chart 5

Impulse response functions of Austrian bank variables after a cost-push inflation shock



Source: Author's calculations.

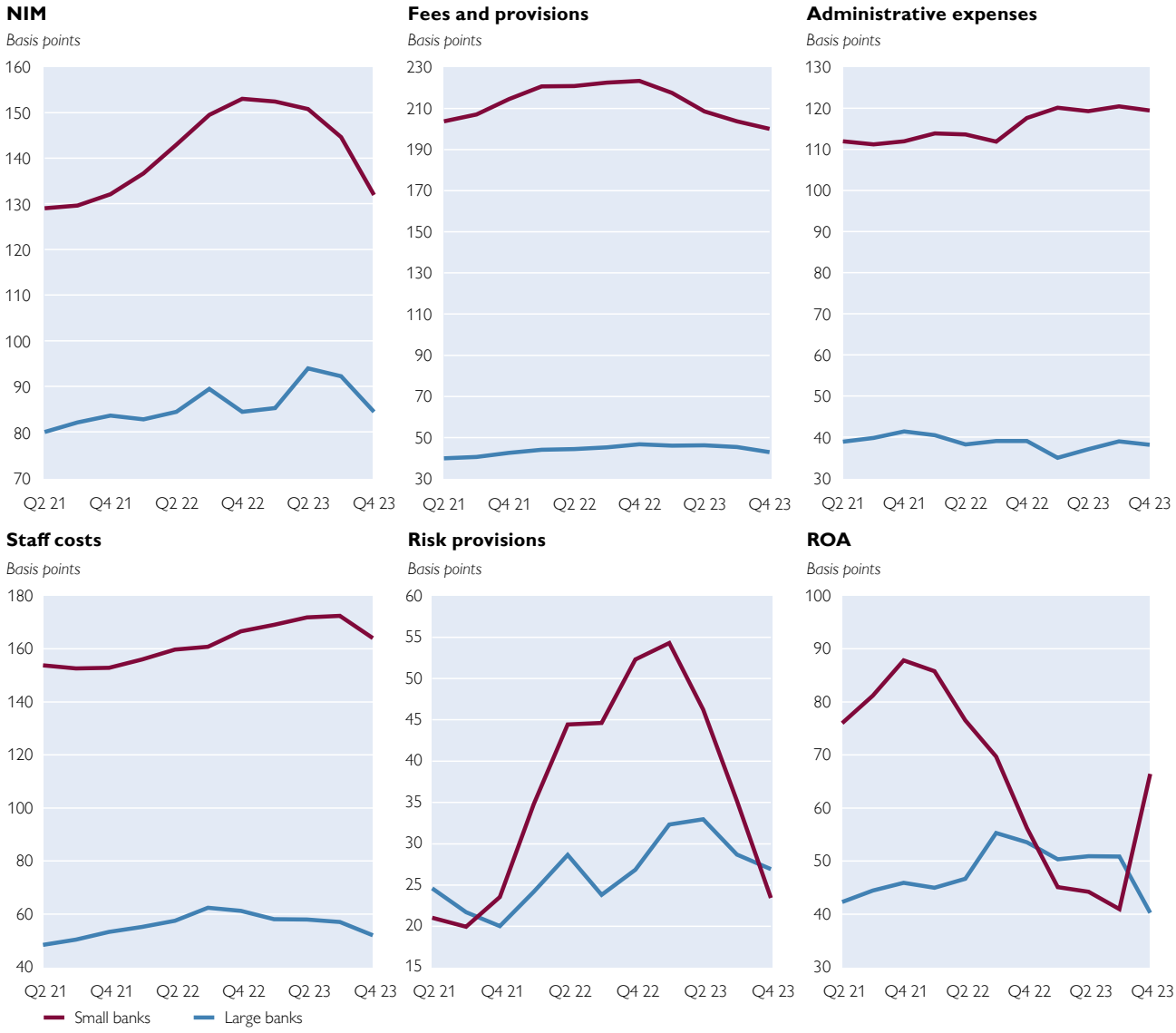
Note: The red line shows the impulse response of the bank variables. The dashed blue lines mark the 90% confidence bands that result when we use the Newey-West correction for serial correlation with a truncation parameter of 4.

To put this into a quantitative perspective, chart 6 shows how the inflationary shocks of the current high inflation period (Q2 21 to Q1 23) affected bank variables, starting from their 2021 means. For an average small bank, it is estimated that the cost-push shocks increased the NIM by 25 basis points (19%) and fees and commissions income by 20 basis points (10%) until end-2022. They also caused administrative expenses and staff costs to rise by 9 basis points (8%) and 19 basis points (12%), respectively. Their most significant effect is the increase in small banks' risk provisions by 35 basis points (150%) though. This is the main reason why the shocks reduced the ROA of small banks by 45% from around 75 basis points in 2021 to 40 basis points in 2023. For large banks, the model predicts that the current inflationary shocks increased the NIM and fees and commissions income by 14 basis points (18%) and by 7 basis points (17%), respectively, while the effect on costs was concentrated on staff costs increasing by 14 basis points (30%). Risk provisions went up only by 8 basis points (33%) due to the inflationary shocks, contributing to a modest increase in large banks' ROA by 13 basis points (31%). Comparing the predicted values with actual data, we find that the model's underestimation of NIM increases is particularly striking. Between Q1 21 and Q1 23,

the actual average NIM for small (large) banks increased by 111 (38) basis points, while the model predicts increases of 24 (6) basis points. This probably has two reasons: First, as explained above, the model underestimates interest rate increases as such. Second, the pass-through of interest rate increases to deposit rates has been exceptionally low in the current hiking cycle, as documented e.g. by Ferrer et al. (2023).

Chart 6

Effects of cost-push inflation shocks on bank variables in Austria in the high inflation period



Source: Author's calculations.

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Annex

Table A1

Descriptive statistics for small and large banks (Q4 98 to Q4 01)

	Number of observations			Means, basis points		
	All banks	Small banks	Large banks	All banks	Small banks	Large banks
Net interest margin (NIM)	62,646	56,295	1,468	193	201	89
Fees and commissions income	62,693	56,232	1,451	166	178	37
Administrative costs	62,655	56,291	1,408	107	113	38
Staff costs	62,649	56,290	1,442	158	167	55
Risk provisions	21,908	16,672	1,501	23	21	25
Return on assets (ROA)	62,653	57,028	1,484	73	76	34

Source: OeNB.

Repricing of bank assets and liabilities in the current rate hike cycle: historical perspective and impact on bank profitability

Peter Breyer, Stefan Girsch, Jakob Hanzl, Mario Hübler, Sophie Steininger, Elisabeth Wittig[1]

After several years of low or even negative interest rates, rates have been rising since mid-2022. While banks in Austria had been unable to pass negative interest rates on to retail deposits because they were legally required to keep these rates above 0%, the Austrian banking sector benefited from the current rate hike cycle, with banks reporting high profitability levels. Deposit margins have increased since mid-2022, as have various credit spreads (i.e. the difference between lending and deposit rates). Furthermore, banks' high profitability is also driven by historically low credit risk costs.

The average overnight deposit rate in Austria (0.69% in July 2023) is higher than the euro area average of 0.27%. For loans, and in particular for consumer loans, however, both the interest rate level and pass-through rate are also higher in Austria. This is attributable, inter alia, to the combined effect of a higher share of variable rate loans and an inverted yield curve. In sum, Austrian banks' credit spreads increased faster in the current rate hike cycle than those of banks in other euro area countries.

We find low cumulative betas (i.e. the pass-through of a reference rate to the deposit rate) for overnight deposits (16% for households in the current rate hike cycle) and higher betas for new term deposits (up to 88% for nonfinancial corporations and 65% for households). A main reason for the historically low betas observed in the current cycle is the excess liquidity in the market. Finally, we find that interest rates are passed on to deposits more slowly in times of increasing interest rates than in times of declining interest rates.

After the onset of the global financial crisis and during the low interest rate environment prevailing until mid-2022, euro area banks' cost of equity was consistently higher than their return on equity. Bank profitability increased in the current rate hike cycle, and in light of macroeconomic uncertainties and potentially rising credit risk costs, banks should use profits to further strengthen their capital position.

JEL classification: G21, G28, E43, E58
Keywords: Austrian banks, profitability, interest rates, deposit margins, interest margins, deposit betas

Having remained at low or even negative levels for several years, interest rates in the euro area have been rising since mid-2022.[2] The impact and implications of the rising interest rate environment on bank profitability, deposit and lending rates have been discussed both in public and in academia. This paper analyzes the impact of rising interest rates on deposit and lending rates with regard to bank profitability, which is currently very high with increasing interest margins being the main driver. We further compare Austrian banks' interest rate pass-through to that of other euro area banks.

[1] *Oesterreichische Nationalbank, Supervision Policy, Regulation and Strategy Division, EGSA-EAA@oenb.at. Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the OeNB or the Eurosystem.*

[2] *As of September 20, 2023, the deposit facility rate reached 4% and the marginal lending facility rate 4.5%.*

The paper is structured as follows: In section 1, we show how Austrian banks' profitability, interest rates, deposit margins and credit spreads developed over the long term and compare the interest rate pass-through of Austrian banks with that of banks in other euro area countries. In section 2, we analyze the development of cumulative deposit betas and conduct a cross-correlation analysis between market interest rates and retail deposit rates. Finally, section 3 summarizes our key findings.

1 Interest rates and bank profitability from a historical perspective

This section describes how Austrian banks' profitability and key interest rates have developed since 2004.

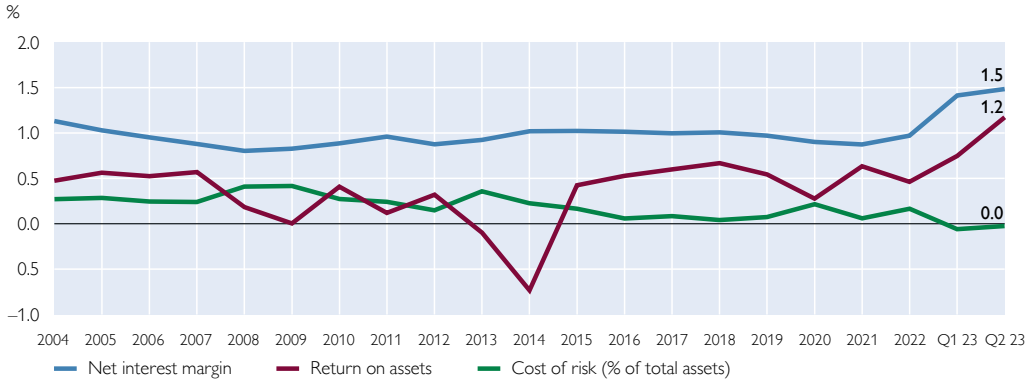
1.1 Development of interest rates and bank profitability in Austria

After a long period of very low interest rates and weak profitability, the Austrian banking sector benefited from the current rate hike cycle, with Austrian banks reporting increasing profitability levels. Both the aggregated net interest margin (NIM) (1.5%) and the aggregated return on assets (ROA) (1.2%) of the Austrian banking sector have reached their highest levels since 2004,[3] as chart 1 shows. This improvement in bank profitability can be attributed mainly to rising net interest margins. Retail deposits and other deposit rates tend to be sticky. Consequently, when market interest rates rise, deposit rates do not increase at the same pace as lending rates, thus leading to an improvement of banks' net interest margins and, consequently, profitability. (English et al., 2018; Demirgüç-Kunt et al., 1999; Sääskilahti, 2018) The second main driver of banks' high profitability are historically low credit risk costs, which currently stand at around 0% (chart 1).

Before the financial crisis, which started in 2007, interest rates in Austria had been on the rise since late 2005 when the European Central Bank (ECB) started to raise its policy rates as the economy was booming and risks to price stability increased. During the financial crisis, the ECB cut its policy rate to 1% while guar-

Chart 1

Annualized net interest margin, return on assets and cost of risk in Austria since 2004

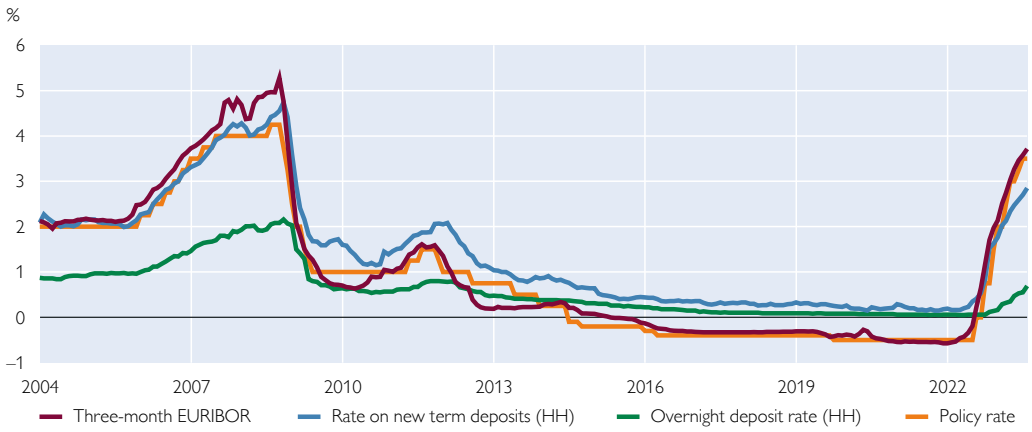


Source: OeNB.

[3] *All ratios mentioned in this paper are annualized and based on unconsolidated banking data. Interest rates are unconsolidated and include direct cross-border business of Austrian banks as well as business of foreign banks and branches in Austria.*

Chart 2

Interest rates in Austria since 2004



Source: ECB, Bloomberg.

Note: HH = households.

anteeing banks almost unlimited access to liquidity as long as they had sufficient eligible collateral (Stark, 2009). The period from 2009 to 2022 was characterized by decreasing interest rates in the euro area – the three-month EURIBOR fell from over 5% to approximately –0.5% and the average overnight deposit rate declined from slightly over 2% to 0.1%. Rates remained at low levels until July 2022 when the ECB decided to raise its rates to counteract rising inflation. Importantly, current deposit rates should be analyzed in light of the excess liquidity existing in the market and the adverse impact on deposit competition (Agénor and El Aynaoui, 2010).

In the following, we will analyze the development of interest rates, spreads and deposit betas since the beginning of the current rate hike cycle as well as from a longer historical perspective and draw conclusions regarding bank profitability.

1.2 Development of deposit margins and interest rate spreads in Austria

Since mid-2022, the deposit margins of Austrian banks have increased significantly (chart 3). Before 2022, the interest rate environment was characterized by negative deposit margins (indicating that the three-month EURIBOR and the deposit facility rate were lower than overnight and term deposit rates, respectively).[4] Since the beginning of the current rate hike cycle, deposit margins have surged to record levels.

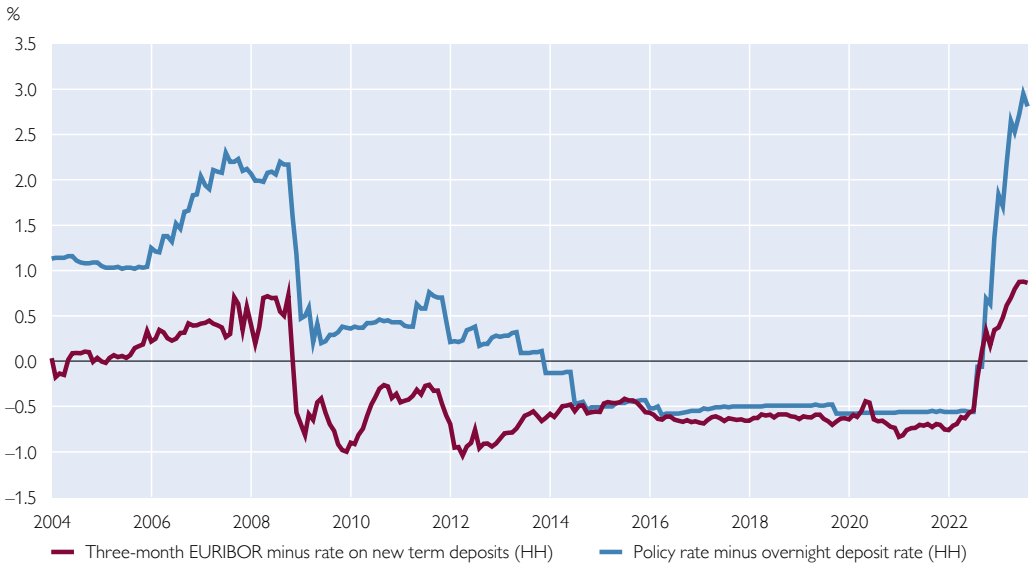
As of end-July 2023, Austrian banks paid on average 281 basis points less than the deposit facility rate on overnight deposits and 86 basis points less than the three-month EURIBOR on new term deposits, which constitute the highest margins for both overnight and term deposits in the period under review.[5]

[4] *This is also attributable to the fact that, by legal requirement, household deposit rates in Austria must not drop below 0%.*

[5] *In this paper, we define the ECB policy rate as the rate for main refinancing operations (MRO) until May 2014 and the deposit facility rate (DFR) from June 2014.*

Chart 3

Deposit margins in Austria since 2004

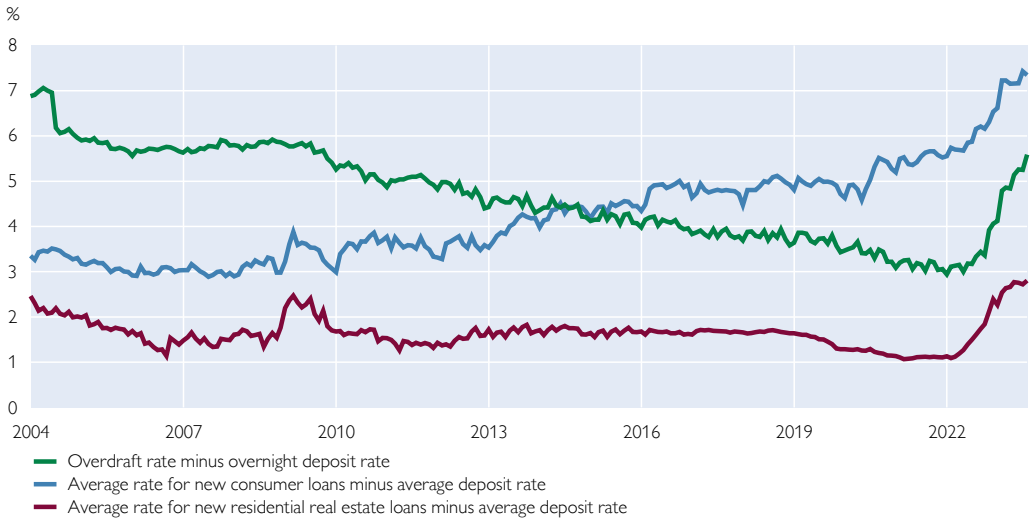


Source: ECB, Bloomberg.

Note: HH = households.

Chart 4

New business (households): credit spreads in Austria since 2004



Source: ECB.

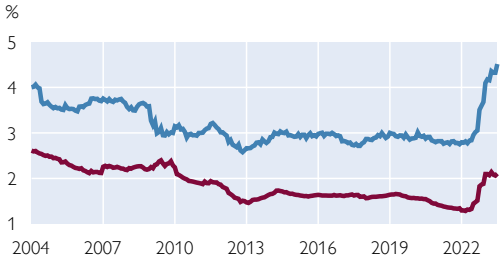
With regard to the impact of rising rates on bank profitability, the development of deposit rates should be analyzed in relation to the development of lending rates and the resulting overall impact on the respective spreads. Since the beginning of the current rate hike cycle, spreads between deposit and lending rates have increased significantly, as shown in chart 4. The interest rate spreads for both new consumer loans and new residential real estate (RRE) loans are currently at their

highest levels since 2004.[6] Similarly, the spread between the average overdraft rate and the overnight deposit rate has increased sharply since the beginning of 2022.

While chart 4 focuses on interest rates of newly granted loans, chart 5 shows the development of interest spreads with regard to total outstanding volumes and compares the difference between average lending rates and average deposit rates. Austrian banks benefited from the current rate hike cycle, with deposits repricing at a much slower pace than loans, leading net interest margins and therefore profitability to increase to high levels. The most important drivers are the sharp increase in consumer loan rates and the slow repricing of overnight deposits. As chart 1 shows, historically low credit risk costs further contributed to the high profitability of Austrian banks.

Chart 5

Outstanding volumes (households): credit spreads in Austria since 2004



Source: ECB.

1.3 Comparison of Austrian and euro area interest rates

Deposit rates are well below current market rates, and repricing has been especially slow for overnight deposits. Comparing Austrian banks with banks from other euro area countries, Ferstl et al. (2023) showed that Austrian banks are characterized by a higher pass-through rate than their euro area peers, both for overnight and term deposits. At 0.69%, the average overnight deposit rate in Austria is higher than the euro area average of 0.27% (while term deposits were approximately at the same level as in July 2023). Term deposit rates increased at a faster pace and were at the same level in Austria (2.85%) and the euro area (2.83%) in July 2023.

However, when looking at the asset side, we also see that the interest rate level and the pass-through rate for lending are higher for Austrian banks, which is especially true for consumer loans. The average rate for newly granted consumer loans is higher in Austria (8.71%, which is also the highest figure in the observation period) than in the euro area (7.78%). At 4.17%, the average rate for RRE loans in Austria is also higher than the euro area average of 3.79%. Furthermore, the pass-through of rising rates to loans was faster in Austria than the euro area average. When comparing the pass-through rates of Austrian banks with the euro area average, it is important to highlight that the share of newly granted RRE loans with variable interest rates is significantly higher in Austria (50% in July 2023)[7] than in the euro area (19%). Variable rate loans traditionally make up a relatively large proportion of total loans in Austria (Gnan et al., 2019). Given the currently inverted yield curve, this higher share of loans with variable interest rates therefore might explain the higher pass-through rate Austrian banks recorded on the asset side.

[6] *The average deposit rate is calculated as the volume-weighted average rate of outstanding overnight and term deposits.*

[7] *Share of new variable rate loans in total loans for house purchase (floating rate or initial rate fixed for a period of up to one year). In Austria, the outstanding volume of RRE loans with variable interest rates stood at 41.7%, with fixed rates coming to 6.4% and partly fixed and partly variable components to 51.8% as of June 2023.*

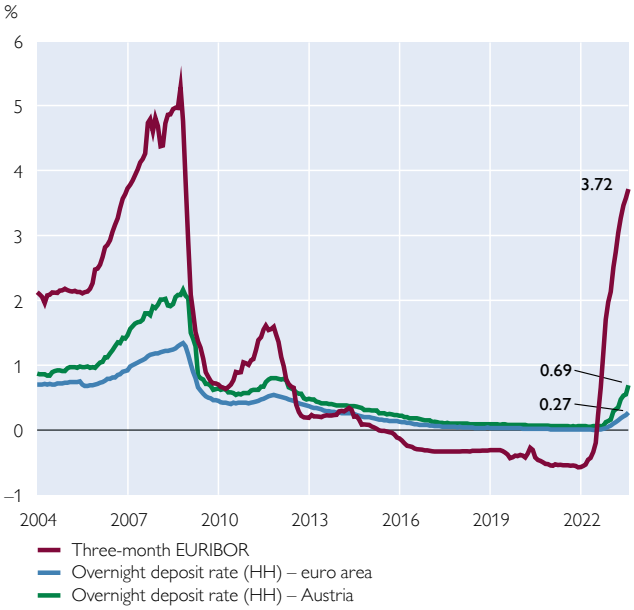
Overall, Austrian banks' credit spreads widened faster during the current rate hike cycle than those of banks in other euro area countries as a stronger increase in lending rates more than offset the higher pass-through in deposit rates.

The following charts compare the development of deposit and lending rates of Austrian banks and of other euro area banks:

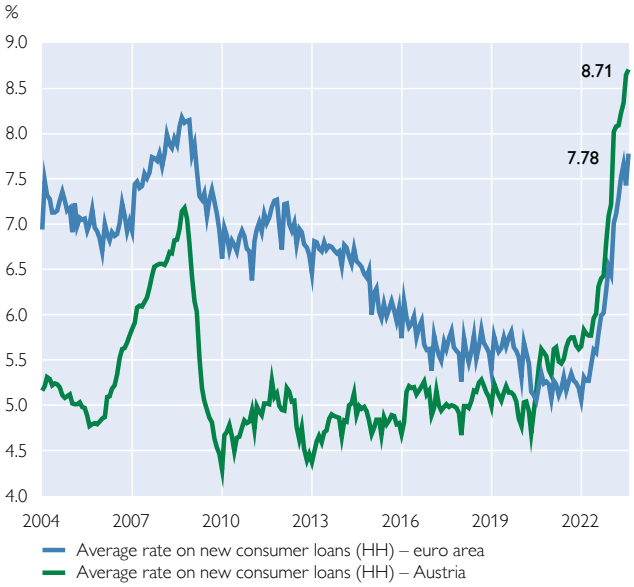
Chart 6

Deposit and lending rates in Austria and the euro area since 2004

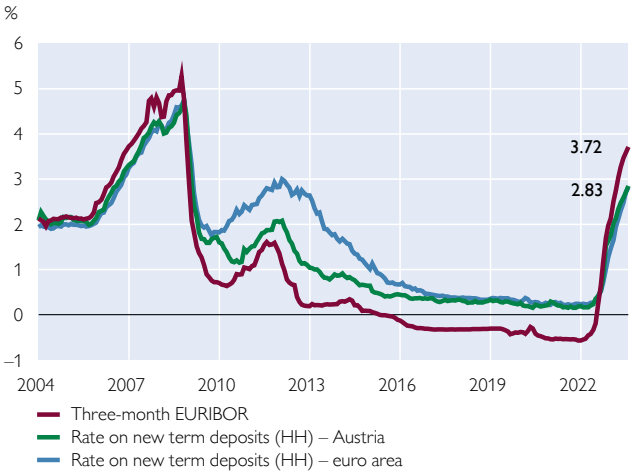
Overnight deposits: Austria vs. euro area



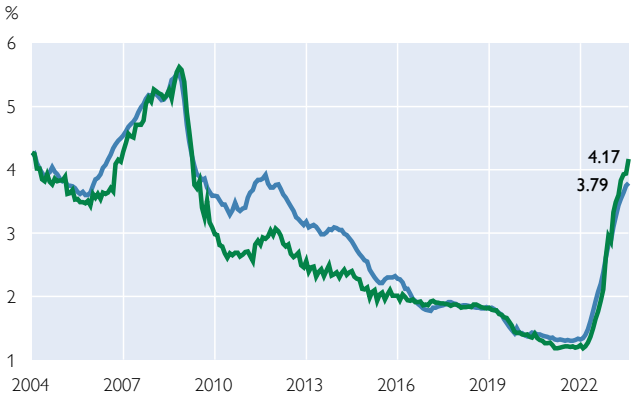
Consumer loans: Austria vs. euro area



Term deposits: Austria vs. euro area



Residential real estate loans: Austria vs. euro area



Source: ECB.

Note: HH = households.

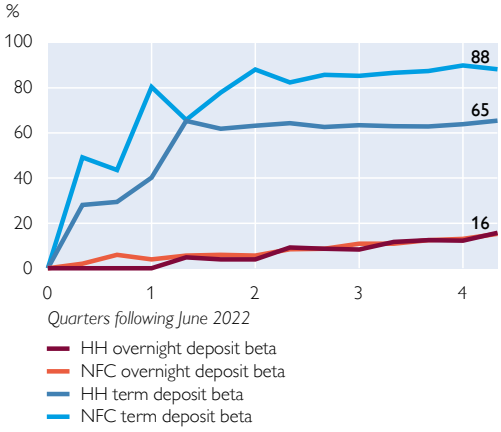
2 Interest rate pass-through

2.1 Comparison of deposit betas

Deposit betas measure the pass-through of monetary policy rates to bank deposit rates. They show what portion of an interest rate increase is passed on to deposit rates (Kang-Landsberg, 2023). We calculated deposit betas for term deposits based on the three-month EURIBOR and for overnight deposits based on the deposit facility rate (DFR).[8] As chart 7 shows, we find low pass-through rates for overnight deposits both for households and nonfinancial corporations (NFCs) – 15% and 16%, respectively. Regarding term deposits, NFCs exhibit a substantially higher beta (88%) than households (65%), which can be partly attributed to their greater bargaining power. On the other hand, NFCs were affected by negative interest rates on their deposits during the negative interest rate environment until 2022.

Chart 7

Deposit betas for Austrian households and nonfinancial corporations during current rate hike cycle (starting June 2022)



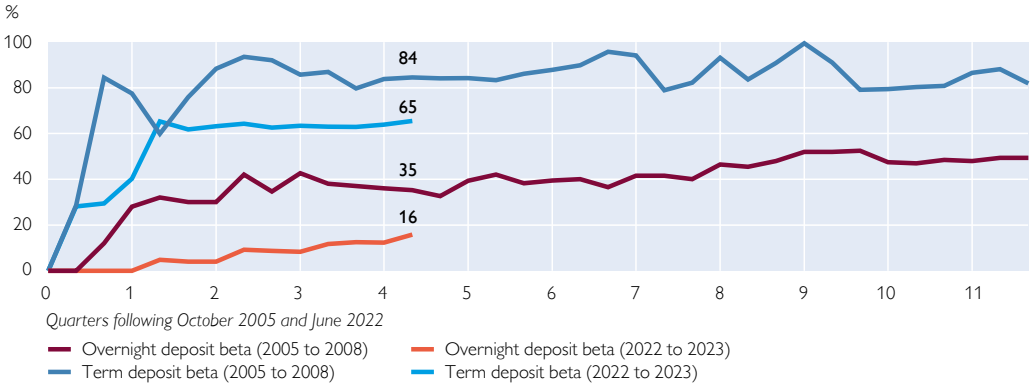
Source: ECB, authors' calculations.

Note: HH = households; NFC = nonfinancial corporations.

When we compare the current rate hike cycle with the interest rate increase in the pre-financial crisis period, we see that the cumulative betas for both overnight and term deposits are significantly lower now than in the period before the financial crisis. From the beginning of the fifth quarter of the current rate hike cycle, the overnight deposit beta in Austria has remained low, at 16% (chart 8). This con-

Chart 8

Betas for Austrian households during current[1] and pre-financial crisis[2] rate hike cycles



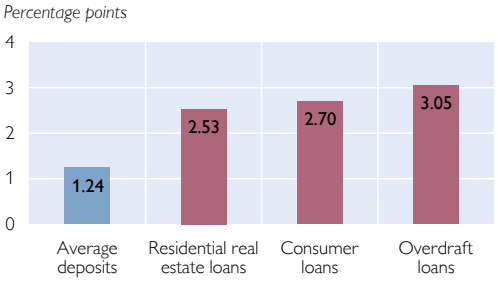
Source: ECB, authors' calculations.

[1] June 2022 to July 2023.
[2] October 2005 to November 2008.

[8] *We calculated cumulative deposit betas for term deposits as the change in interest expense on deposits relative to the change in the three-month EURIBOR and for overnight deposits relative to the change in the DFR.*

Chart 9

Household deltas for loans and deposits during current rate hike cycle (starting June 2022)



Source: ECB, authors' calculations.

trasts with the 35% beta observed for the same period in the 2005–2008 cycle. Hence, the deposit betas in the current rate hike cycle are relatively low, also from a historical point of view. A main reason for these historically low betas is that the excess liquidity in the market, which is also driven by monetary policy and the low interest rate environment, leads to reduced competition for bank deposits (Agénor and El Aynaoui, 2010).

Examining the absolute change in interest rates for total deposits[9] and loans, we find a significantly larger increase in lending rates, since mid-2022, than in deposit rates. As chart 9 shows, the average deposit rate (defined as the weighted average of overnight and term deposits) went up by 124 basis points, while lending rate increases ranged from 253 basis points (RRE loans) to 305 basis points (overdrafts). Lending rates, however, might also rise with expectations of rising credit risk.

2.2 Cross-correlation analysis of market interest rates and retail deposit rates

Following the approach of de Bondt (2005), we conducted a cross-correlation analysis between the market interest rate (one-month EURIBOR)[10] and retail deposit rates (overnight deposit rate and rate for new term deposits). Our goal was to identify differences in the repricing of bank deposits in different interest rate environments (rising interest rate environment vs. decreasing rate environment).

First, we separately calculated the cross-correlation coefficient for rising and decreasing interest rate environments,[11] excluding the low interest rate environment between 2012 and 2022 from our analysis. Second, we calculated the cross-correlation coefficient across different time lags to identify the period within which changes in the market interest rate showed the closest similarity to changes in deposit rates.[12] Third, we identified the lag with the highest correlation coefficient and the corresponding coefficient for Austria and for the euro area (see table 1 and table 2).

During times of increasing interest rates, we find a lower correlation and pass-through of interest rates than in times of decreasing interest rates. This is consis-

[9] *Overnight deposits account for 67% of total deposits in Austria, compared to 77% in the euro area as of July 2023.*

[10] *We also conducted a cross-correlation analysis with the three-month EURIBOR and the €STR/EONIA rate, finding similar results. When the €STR/EONIA is used as a reference rate for overnight deposits, the result for Austria is even more pronounced, with a coefficient of 0.38 (lag 4) in an increasing rate environment and 0.63 (lag 0) in a decreasing rate environment.*

[11] *Rising interest rate environment: April 2004 to November 2008, April 2010 to July 2011 and March 2022 to August 2023. Decreasing interest rate environment: January 2003 to March 2004, September 2008 to March 2010 and August 2011 to August 2012.*

[12] *For example, lag 1 indicates that the highest correlation was observed after one month.*

tent with observations that bank profitability benefits during the first phase of a rate hike cycle due to a slower repricing of deposits and relatively benign credit cycles.

For overnight deposits and term deposits in Austria and the euro area, the correlation coefficient is lower in a rising rate environment than in a decreasing rate environment. Additionally, in a rising interest rate environment, the time lag with the highest correlation is higher for overnight deposits than for term deposits. We conclude that the highest correlation occurs later in a rising interest rate environment than in a decreasing rate environment and that the interest rate pass-through takes place at a later point in time in a rising interest rate environment. Overall, interest rates are passed on to deposits more slowly (longer lag) and to a lesser extent (lower coefficient) during times of increasing interest rates than during times of decreasing interest rates.

Table 1

Cross-correlation analysis for Austria

	Increasing interest rate environment		Decreasing interest rate environment	
	Lag (months)	Coefficient	Lag (months)	Coefficient
Households' overnight deposits	4	0.41	1	0.63
Households' term deposits	1	0.45	1	0.86

Source: Bloomberg, authors' calculations.

Table 2

Cross-correlation analysis for the euro area

	Increasing interest rate environment		Decreasing interest rate environment	
	Lag (months)	Coefficient	Lag (months)	Coefficient
Households' overnight deposits	3	0.27	1	0.79
Households' term deposits	1	0.65	1	0.83

Source: Bloomberg, authors' calculations.

3 Summary and conclusions

After several years of low and even negative interest rates, the Austrian banking sector has benefited from the current rate hike cycle: Austrian banks have been reporting high profitability levels and the sector's aggregated net interest margin and aggregated return on assets have reached their highest levels since 2004, at 1.5% and 1.2%, respectively, while credit risk cost is historically low.

Austrian banks' deposit margins have increased significantly since mid-2022. At the end of July 2023, Austrian banks paid on average 281 basis points less than the deposit facility rate on overnight deposits and 86 basis points less than the three-month EURIBOR on new term deposits. Similarly, various credit spreads have increased in the current rate hike cycle. Both the spreads for new consumer loans and new residential real estate loans (relative to average deposit cost) are currently at an all-time high.

The average overnight deposit rate in Austria (0.69% as of July 2023) is above the euro area average of 0.27%, while Austrian term deposit rates are approximately at the same level as the euro area average. We find that both the interest rate level and the pass-through rate for lending are higher in Austria, which can be explained, inter alia, by the fact that the share of variable rate loans in Austria is higher while the yield curve is currently inverted. In sum, Austrian banks' credit spreads increased faster in the current rate hike cycle than those of other euro area banks.

We find low cumulative betas for overnight deposits for households (16%) and nonfinancial corporations (15%) in the current rate hike cycle and higher betas for new term deposits (88% for nonfinancial corporations and 65% for households). A

comparison of the current rate hike cycle with the pre-financial crisis period shows that the cumulative beta is lower during the current rate hike cycle for both overnight and term deposits. Among the main reasons for the historically low betas observed in the current cycle are the excess liquidity in the market and its impact on deposit competition. Finally, we conducted a cross-correlation analysis to identify differences in the repricing of bank deposits in different interest rate environments. We find that interest rates are passed on to deposits more slowly and to a lesser extent in times of increasing interest rates than in times when interest rates are going down.

After the onset of the global financial crisis and during the low interest rate environment that prevailed until mid-2022, euro area banks' cost of equity was consistently higher than their return on equity (Altavilla et al., 2021). Bank profitability increased in the current rate hike cycle. In light of macroeconomic uncertainties and potentially rising credit risk costs, however, banks should use their profits to further strengthen their capital position.

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Austria's deposit guarantee scheme – resilient in uncertain times

Judith Eidenberger, Katharina Steiner[1]

Austria's deposit guarantee scheme (DGS) is multilayered, consisting of three separate schemes. Between 2020 and 2022, Austria's DGS faced four payout events. Although its setup is rather complex and the payout events occurred in periods of exceptional macroeconomic uncertainty, Austria's DGS has proved resilient, and depositors have remained confident. We identify three key aspects that helped maintain the credibility of Austria's DGS: (1) a well-functioning setup and funding structure, (2) the efficient operational management of the payouts and (3) the superiority of the DGS in the creditor hierarchy and sound insolvency procedures.

JEL classification: G21, G28, H12
Keywords: deposit guarantee scheme, payout event, financial stability, systemic risk

Deposit guarantee schemes (DGSs) play a special role within the banking system and with regard to financial stability. They ensure that fundamentally risky deposits can be regarded as assets that are safe for depositors. This is necessary because banks' balance sheets are intrinsically risky: Short-term, nominally fixed deposits on the liability side face long-term, risk-bearing assets on the asset side. If a bank fails, a DGS steps in, paying out the covered deposits to affected depositors within seven working days.[2] Guaranteeing deposits should prevent bank runs and safeguard financial stability (Diamond and Dybvig 1983).

Austria's deposit guarantee scheme is made up of three different DGSs that managed four payout events between March 2020 and March 2022 – in two years of exceptional macroeconomic uncertainty, characterized by the COVID-19 pandemic, the war in Ukraine and the energy crisis. This paper examines the impact of these four payout events on banks and depositors in Austria by analyzing banks' reporting data and undertaking a media analysis. Our results show neither a negative impact on Austrian banks' resilience nor a slump in deposits and depositor confidence nor a loss in credibility for Austria's DGSs. The paper is structured as follows: Section 1 describes the multilayered structure of Austria's DGS. Section 2 takes a financial stability perspective, focusing on the OeNB's integrated macroprudential approach. Section 3 summarizes the impact of the four recent payout events in Austria. Section 4 concludes.

[1] *Oesterreichische Nationalbank, Financial Stability and Macroprudential Supervision Division, judith.eidenberger@oenb.at and katharina.steiner@oenb.at.* *Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the OeNB or the Eurosystem. The authors would like to thank Stefan Lukas, Stefan W. Schmitz and Peter Strobl (all OeNB) for helpful comments and valuable suggestions.*

[2] *The European Deposit Guarantee Schemes Directive (DGSD) was implemented in Austria by the Act on Deposit Guarantee Schemes and Investor Compensation (Einlagensicherungs- und Anlegerentschädigungsgesetz – ESAEG). Inter alia, the ESAEG regulates the DGS setup and payout procedures in Austria. The Austrian DGS protects the deposits of private individuals as well as partnerships, corporations, communities of owners and private membership associations up to a threshold of EUR 100,000. It does not protect the deposits of credit institutions and institutional investors, such as financial service providers and insurance companies, or public sector deposits.*

1 The structure of Austria's DGS is multilayered

While most European countries have one integrated DGS, the Austrian DGS combines three different deposit guarantee institutions, one each for the largest two subsectors of the Austrian banking system, (1) Sparkassen savings institutions and (2) Raiffeisen credit cooperatives, and a general DGS for (3) all other Austrian banks. Its structure is thus more complex as larger payouts involve more than one DGS.

In line with the EU Deposit Guarantee Schemes Directive (Directive 2014/49/EU – DGSD), payout events should primarily be financed by banks and not by public funds. As in a payout event DGSs need to act swiftly and make funds immediately available to the depositors of the failing bank, they need a clear and reliable funding structure to be credible. In line with the DGSD, there are three sources of DGS funding: (1) ex ante funds, to be built up by the DGS member banks independently of any payout event, (2) ex post contributions and (3) extraordinary contributions with alternative funding arrangements to obtain short-term funding (e.g. credit operations with a public guarantee serving as a last resort).

Each deposit-taking credit institution is required to be a member of a DGS. In Austria, three DGSs are currently in place:

1) Sparkassen-Haftungs GmbH (s-Haftung) for Austrian saving institutions (since 2019);
2) Österreichische Raiffeisen-Sicherungseinrichtung eGen (ÖRS) for Raiffeisen credit cooperatives (since end-2021);[3]
3) Einlagensicherung Austria GmbH (ESA) for all other Austrian banks and their branches (a total of around 100) (since 2019).

All Austrian DGSs are required to build up ex ante funds equivalent to at least 0.8% of the covered deposits of their members by July 2024.[4] Payouts are funded in five steps (figure 1). First, the ex ante funds of the DGS concerned are used. Second, if the covered deposits of the failing bank exceed the DGS's ex ante funds, its members have to make ex post contributions of up to 0.5% of each member's own stock of covered deposits. Third, the two other DGSs' ex ante funds can be drawn ("overflow"). If necessary, the fourth step is activated, drawing on ex post contributions of the other two DGSs (again, up to 0.5% of each bank's own stock of covered deposits). In the event that the payout case exceeds even these funds, the fifth step of funding is activated: All banks are obliged to provide additional extraordinary contributions; based on the rule of "facultas alternativa" that applies in Austria, DGS members have the option to settle these extraordinary contributions by granting a loan to the DGS – an option that is less capital intensive for the bank in question. This option reduces the bank's costs and limits contagion as well as the probability that state aid is required for banks affected by large DGS payouts. In specific circumstances, the Austrian Ministry of Finance may even grant a federal guarantee on such credit operations.

During insolvency procedures after a DGS payout case, DGSs can claim their expenses from the insolvency estate. DGSs enjoy preferred creditor status in the

[3] *With the exception of just a few Raiffeisen institutions, all regional credit cooperatives in Austria are members of ÖRS.*

[4] *In addition to the share of covered deposits, supervisors consider a (less relevant) bank-specific risk component when prescribing each bank's contribution.*

Figure 1

The five steps of funding a payout event in Austria

	Funding source	Volume	Participation
1	Ex ante funds	Up to 0.8% of covered deposits	DGS concerned
2	Ex post contributions	Up to 0.5% of covered deposits	DGS concerned
Overflow			
3	Ex ante funds	Up to 0.8% of covered deposits	Other 2 DGSs
4	Ex post contributions	Up to 0.5% of covered deposits	Other 2 DGSs
5	Extraordinary contributions ("facultas alternativa")	Unlimited	All DGSs

Source: OeNB.

Note: The 2020 reform of the Austrian DGS gave DGS members the opportunity to settle extraordinary contributions exceeding the 0.5% threshold by granting a loan to the DGS ("facultas alternativa").

creditor hierarchy, ranking at the same level as paid-out covered depositors, which enjoy superiority under the DGSD. This superior status of the DGSs helps increase and speed up the recovery of DGS payouts (Hardy, 2014).

2 DGS: an important pillar of financial stability

Establishing a DGS aims at reducing systemic risk and increasing financial stability by preventing bank runs. In general, financial stability builds on credibility. The credibility of a DGS is based on depositors' perception of how well and fast it can handle payout events, of its institutional setup and of banks' risk-bearing capacity.

Systemic risk analysis helps financial stability supervisors and macroprudential authorities assess whether a country's DGS has a risk-mitigating or -amplifying effect (Schmitz and Eidenberger, 2021). Specifically, it determines the capacity of the DGS and identifies potential need for reform or (macro)prudential measures. Such (macro)prudential measures usually aim at increasing capitalization in the respective banking system and thus increase the system's capacity to absorb the contagion effects of a DGS payout. In its systemic risk analysis, the Oesterreichische Nationalbank (OeNB) evaluates the capital and liquidity effects of simulated payout events on banks.

In 2022, the OeNB conducted its most recent DGS-related systemic risk assessment for the Austrian Financial Market Stability Board (FMSB). Based on simulations of fictitious payout events, the effects of these fictitious events on other banks' capital and liquidity coverage ratios were assessed for different capital and liquidity requirement scenarios. The capacity threshold of the DGS was set so that the remaining capital and liquidity in the banking system is sufficient not to endanger financial stability. This capacity threshold plays a major role in the OeNB's integrated macroprudential approach as it is also applied in identifying systemically relevant banks.

This approach considers financial stability measures, crisis prevention and crisis resolution[5] in equal measure and thus ensures consistency between macroprudential regulation, the bank resolution regime and the DGS. In macroprudential supervision, the interplay of measures in these three areas is of major interest (for more details on the integrated approach, see annex).

3 Past payout events in Austria had only insignificant impact on financial system

Although the four recent Austrian payout events[6] were caused by individual bank failures, they were of systemic relevance to Austria's DGSs. They occurred within the space of just two years – between March 2020 and March 2022 – in times of heightened macroeconomic uncertainty caused by the COVID-19 pandemic, the war in Ukraine and the energy crisis. Moreover, the DGSs had to immediately refill their ex ante funds to remain capable of acting swiftly in any further payout event. Despite these broad-based uncertainties, no bank run occurred, no major shifts in deposits were observed and financial stability in the Austrian banking system remained stable. Depositors remained confident in the financial system although uncovered depositors incurred losses. In the following, we examine the immediate impact of the payout events on Austria's DGSs and Austrian banks' contributions to the payouts and also consider the depositors' perspective. We find that the DGSs were able to handle (even cross-border) payouts swiftly.

3.1 Austrian DGSs efficiently funded past payout events

While problems in two banks had been presumably caused by money laundering or fraud (Anglo Austrian Bank and Commerzialbank Mattersburg), the business model of Autobank AG turned out to be unsustainable and its own winddown plans failed in 2021. Sberbank Europe AG (Sberbank), a 100% subsidiary of Sberbank of Russia, failed for external reasons.[7] In these four cases, ESA had to manage payouts ranging from EUR 59 million to EUR 947 million per bank in a relatively short period (table 1). ESA's ex ante funds were sufficient in three payout events. This means that Austrian banks were not instantly in need of liquidity. Only in the case of Sberbank, all three Austrian DGSs had to finance the payout together under a special regulation[8] and the overflow mechanism was activated for the first time (for the ex ante funds only). While ESA and s-Haftung were able to finance their liquidity requirements by drawing on their ex ante funds only, ÖRS had to levy additional contributions from its members as its share in the payout

[5] *In a recent working paper, Ebner and Westhoff (2022) argue for a stronger integration of approaches to (macro)prudential regulation and resolution, identifying Austria as the only country in their sample that applies such an integrated approach.*

[6] *Anglo Austrian AAB Bank AG (formerly Meinl Bank), Commerzialbank Mattersburg im Burgenland AG, Autobank AG and Sberbank Europe AG.*

[7] *Sberbank faced high liquidity outflows at the beginning of 2022 as Russia invaded Ukraine and was significantly impacted by the sanctions adopted by the USA and the EU.*

[8] *If institutions that joined the Austrian DGS between July 2005 and December 2017 or that changed their DGS membership during that period fail, all Austrian DGSs have to contribute to the ensuing payout already in the first step (even if the ex ante funds of the DGS concerned are sufficient). Sberbank was granted an Austrian banking license in 2013 and thus joined the Austrian DGS in that period. So in this case, the payout was allocated according to the ratio of each DGS member's covered deposits to the total volume of covered deposits of the members of all Austrian DGSs as of December 31, 2021.*

Table 1

Overview of the four most recent Austrian payout events

	Anglo Austrian Bank (AAB)	Commerzialbank Mattersburg (CBM)	Autobank	Sberbank
Time of DGS payout	March 2020	July 2020	July 2021	March 2022
Trigger of DGS payout	Opening of insolvency proceedings	Prohibition to continue business operations	Prohibition to continue business operations	Prohibition to continue business operations
DGS concerned	ESA	ESA	ESA	ESA, s-Haftung, ÖRS
	EUR million			
Covered deposits	59	481	108	947
	%			
Recovery rate (expected)	100	28	100	100 (realized)

Source: OeNB.

exceeded its ex ante funds, which had only just been set up. A fast winddown and the superiority of the DGSs in the creditor hierarchy allowed for a relatively swift and full recovery of funds from the insolvency estate.[9]

These payout events proved that (1) the operational management of the payouts by the DGSs worked well, (2) the concept of five steps of funding is efficient, (3) the superiority of the DGS is important for financial stability and for the credibility of the DGS and (4) good insolvency procedures facilitate the recovery of funds from the insolvency estates.

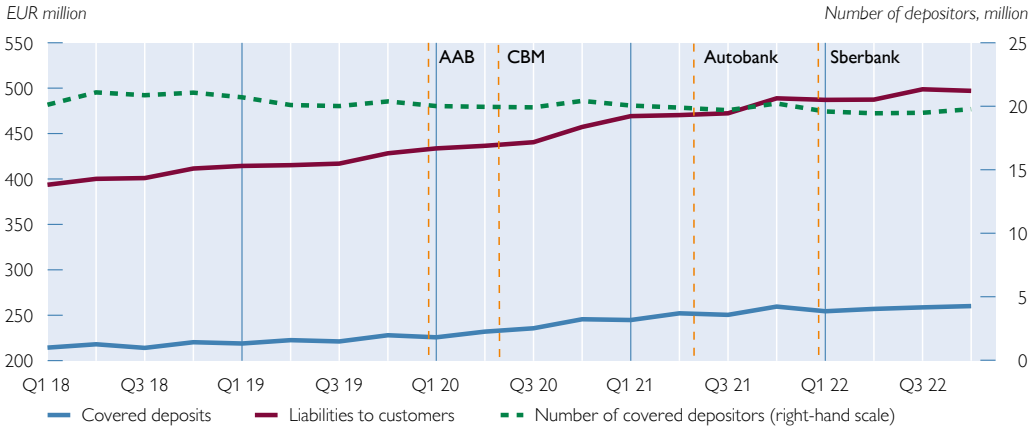
3.2 Development of covered deposits indicates that Austria's DGSs remain credible

In the event of a bank failure, depositors' general trust in the banking sector can be eroded as losses occur for uncovered deposits and covered deposits are being paid out. In general, depositors can react in three different ways: (1) If depositors doubt the credibility of the DGSs, they may react by (partly) withdrawing (covered) deposits from the banking sector and shifting funds from banks to cash or other investment opportunities (e.g. insurers, the capital market or real estate). This reaction would lead to a decrease in the total volume of deposits and, therefore, in the volume of covered deposits. (2) Depositors could also spread their deposits exceeding EUR 100,000 across more than one bank to achieve better protection. This reaction is difficult to analyze as reporting data do not include personalized deposit data. But overall, in such a case, the volume of covered deposits should increase. (3) If DGSs remain credible but trust in some smaller banks deteriorates, depositors might choose larger banks as they assume larger banks are a safer haven for their covered deposits. We test these three potential reactions by analyzing aggregated and bank-level reporting data on covered deposits in particular for the period between the first payout case in March 2022 and year-end 2022.

[9] *Sberbank managed to wind down all its banking business and relinquish its banking license by December 2022. All DGSs profited from the fast winddown and thus from the swift repayments from Sberbank's remaining estate.*

Chart 1

Development of covered deposits shows that DGSs have remained credible

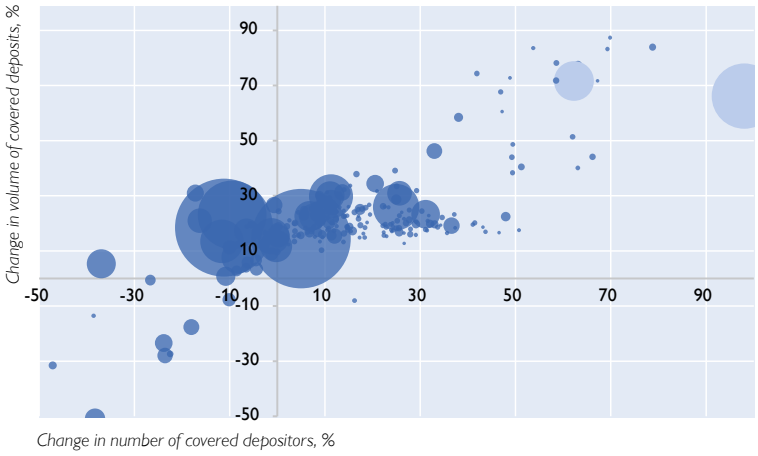


Source: OeNB.

Note: Banks' names indicate the starting point of the respective payout cases. Unconsolidated data.

Figure 2

Payout events did not change customers' preferences for bank size



Source: OeNB.

Note: Q4 22 versus Q1 20. Bubble size reflects 2022 O-SII score. Banks that merged during the observation period (and therefore show a strong increase in covered deposits and depositors) are marked in lighter blue.

No general withdrawal of deposits or covered deposits was observed after the first payout event in March 2020. Chart 1 shows deposits (liabilities to customers) and covered deposits at Austrian banks between March 2018 and December 2022. Both deposits and covered deposits increased by around 15% in volume between March 2020 and end-2022. Hence, we reject (1) that overall trust in Austria's DGSs deteriorated. Rather, the increase in covered deposits indicates that they enjoy high credibility (which supports (2)).

We do not find evidence for the third potential reaction (3), namely that depositors assume larger banks are a safer haven for their covered deposits and move their deposits there. We analyze the change in the number of covered depositors per bank and consider bank size as the differentiating factor (see figure 2).[10] The x-axis shows the change in the number of covered depositors, while the y-axis shows the change in the volume of covered deposits (between Q1 20 and Q4 22). Most banks are located in the upper right-hand

[10] *The O-SII score serves to identify other systemically important institutions. Its calculation is based on quantitative indicators (related to bank size, interconnectedness, relevance for the economy, complexity). The O-SII score ranges from 0 to 10,000 basis points, representing a bank's systemic riskiness. Banks with a score equal or smaller than 1 are not included in the chart.*

quadrant, which indicates an increase in the volume of covered deposits and the number of covered depositors. The largest banks, though, record a smaller increase or even a decrease in the number of covered depositors but still an increase in the volume of covered deposits.

3.3 Payout events well-perceived in Austrian media coverage

When analyzing media coverage of the four DGS payout cases in Austria, we find that the failure of Commerzialbank Mattersburg im Burgenland AG (CBM), Anglo Austrian Bank AG (AAB) and Sberbank attracted the highest attention (counting around 400, 80 and 70 media reports, respectively, in the first year after the bank failure), while coverage of the failure of Autobank, a smaller bank, was less frequent (about 25 media reports). In all four payout events, the fact that covered deposits were fully protected by a well-functioning DGS was already mentioned in the first related news reports. We find no major negative reporting on the protection of covered deposits in the year after the payout case became public. Reports only mentioned larger losses of firms with high amounts of uncovered deposits. However, these losses were related to firms' lack of diversification in their funding strategies rather than to mistrust in the financial system. In the fall of 2020, after the CBM and AAB payout events, Austrian banks publicly called into question the design of Austria's DGS, discussing more strongly risk-based DGS financing and potential contributions from depositors and highlighting the need for better early warning systems to avoid payout events. These discussions faded out, however.

4 Conclusion

In the recent past, Austria's deposit guarantee schemes (DGSs) had to manage a number of payout events in a short period of time (between 2020 and 2022) that was characterized by great macroeconomic uncertainties. Despite the systemic dimension of these events and although uncovered depositors incurred losses, all Austrian DGSs as well as Austria's overall financial stability proved resilient. Our analysis shows that the credibility of Austria's DGSs has been maintained. No significant direct or indirect contagion effects on other banks have been identified. The following factors were found to be crucial in maintaining credibility: First, the well-functioning setup of Austrian's DGSs combined with a well-structured and clear funding structure. Second, efficient operational management allowing for smooth collaboration between the DGSs and swift payouts. Third, the superiority of the DGSs in the creditor hierarchy and sound insolvency procedures, which ensured the fast recovery of funds from the insolvency estate.

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Annex

Austria's integrated macroprudential approach

Austria's integrated macroprudential approach aims at achieving consistency between macroprudential regulation, the applicable bank resolution regime and the DGSs in place. In the following, we describe how these policy areas interact.

In Austria, two structural macroprudential buffers are in place: the other systemically important institution buffer (O-SII buffer) and the systemic risk buffer (SyRB). The O-SII buffer is complementary to the SyRB as it aims to increase the risk-bearing capacity of systemically important banks and mitigate the too-big-to-fail issue. For the Austrian O-SII buffer, the market share of covered deposits is a relevant indicator as the failure of an important bank with a high share of (covered) deposits would stress the DGSs. Financial stability assessments concerning O-SII buffers and bank resolution have the same aim: identifying systemically important institutions. Hence, these two assessments should apply consistent methodologies and thresholds (Ebner and Westhoff, 2022). This is why the OeNB applies both consistent indicators and consistent thresholds in these three policy areas. The DGSs' capacity threshold helps differentiate between banks that are small enough to leave the market under insolvency procedures (i.e. by becoming a payout event) and larger banks that need to be resolved as their insolvency would overburden the DGSs.

What do people in Austria think about green finance?

Andreas Breitenfellner, Heider Kariem[1]
Refereed by: Laurent Millischer, Joint Vienna Institute

This paper analyzes the results of a representative survey of Austrian households (OeNB Barometer) on green, i.e. sustainable, finance. This fast-growing market segment is receiving increasing attention from financial regulators and supervisors. A majority of respondents expect climate change to bring about a continuous deterioration in their financial situation over the next 15 years. At the same time, the answers to the questions specific to green finance suggest that respondents have mainly positive opinions and attitudes about sustainable financial products and businesses. We find this attitude to be more widespread among women as well as people with higher levels of education, middle incomes and higher saving rates. By contrast, age, job status, the size of the city or town where people live and financial literacy appear to play a rather minor role. The impact of these demographic and socioeconomic variables has, for the most part, been confirmed by regression analysis. Looking at actual demand, we find that there is low interest in green financial products, which is consistent with comparable Austrian and international studies. Some answers can be interpreted as evidence that at least a relatively small part of respondents is prepared to do a certain amount of research and even accept lower returns on sustainable investments. That said, contradictory answers suggest that some respondents struggle to understand green finance and related concepts. We also see skepticism about the credibility of financial products marketed as sustainable. Given that greenwashing can undermine the trust of (potential) customers and may consequently jeopardize confidence in the financial sector and financial stability, it is something that should be addressed by financial supervisors.

JEL classification: G41, Q5
Keywords: household survey, green finance, sustainable financial markets, ESG, climate change

The financial sector is expected to take into account sustainability risks and make a significant contribution to financing the climate transition (NGFS, 2019). These challenges cannot be resolved by technocrats disregarding people's expectations, hopes and needs. This study outlines the key results of a representative survey on green finance and sustainable financial markets and puts them into context. The survey (OeNB Barometer) was conducted by the Institut für empirische Sozialforschung (IFES) on behalf of the Oesterreichische Nationalbank (OeNB).[2]

Despite the intrinsic difficulty in defining the term, sustainability is becoming more and more important in the financial world.[3] At the international level, financial service providers use ESG (environmental, social and governance) criteria to identify sustainable products, services and practices. In this paper, we will use the term

[1] *Oesterreichische Nationalbank, International Economics Section, andreas.breitenfellner@oenb.at; Austrian Institute of Economic Research (WIFO), heider.kariem@wifo.ac.at.* *Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the Oesterreichische Nationalbank, the Eurosystem or the Austrian Institute of Economic Research (WIFO). The authors thank Pirmin Fessler, Sandra Mauser, Fabio Rumler and Maria Silgoner (all OeNB) for their helpful comments and valuable input.*

[2] *Some of the questions were coordinated with the International Network on Financial Education (INFE) to create data on financial literacy and holistic inclusion that are comparable across borders (OECD, 2022).*

[3] *A commonly used definition of sustainability is from a UN report (Brundtland, 1987) and says that sustainable development "meets the needs of the present without compromising the ability of future generations to meet their own needs."*

green finance synonymously as it stresses environmental sustainability and, in particular, climate action, both of which require enormous amounts of funding. Even though some segments of the Austrian green finance market have grown out of their niche (Ćetković and Zhan, 2023; FNG, 2023), green finance is still in its infancy measured by the amount of resources that need to be allocated away from high-emission industries and toward low-emission and green sectors (Breitenfellner et al., 2020).[4]

For central banks and other supervisors, managing physical and transition climate and ESG risks takes center stage (NGFS, 2019).[5] In a delayed, slow or disorderly transition, financial risks can arise when the development of green finance is not in line with a corresponding decarbonization of the real economy (Claessens et al., 2022). Depending on the direction of the imbalance, this can lead to a brown or a green speculative bubble. Greenwashing, i.e. a gap between claims of sustainability and the actual positive impact on the environment, represents another realistic risk.[6] Ritsch and Prantner (2022) suggest that exaggerated marketing claims by financial service providers often meet with unclear and/or unrealistic customer expectations. In this regard, Gangl et al. (2023) found in a representative survey in Austria that half of respondents have insufficient sustainability-related financial literacy. Investigating the attitudes of (potential) consumers toward sustainable investment products therefore contributes to analyzing the growth and risk potential of green financial markets, to building trust in financial markets in general, and, consequently, to ensuring their functioning and stability.[7]

Against this backdrop, we analyze the survey results looking for answers to the following questions: Is climate change perceived as a financial threat? To what extent do people understand and accept green financial products? Is greenwashing recognized as a risk? What are the factors influencing people's answers? Can we identify trends when we compare the latest results with those of previous surveys? The results of the OeNB Barometer survey confirm that the majority has a positive opinion and attitude about sustainable financial products and sustainable financial companies. People expecting climate change to have an increasing negative impact on their personal financial situation, representing most respondents, are more likely to be in favor of green finance. In addition, we analyze the specific answer frequencies with regard to demographic, socioeconomic and financial literacy-related characteristics. This study is a shorter version of a forthcoming full report that discusses the results of the survey in more detail.[8]

The remainder of this paper is structured as follows: Section 1 describes the survey, including relevant demographic data. In section 2, we present the key results of the survey regarding climate change and financial prospects as well as the

[4] *The International Energy Agency (2023) estimates in its Net Zero Emissions by 2050 Scenario that more than USD 4.5 trillion in annual global clean energy investments will be needed by 2030.*

[5] *Physical risks of climate change relate, among other things, to natural disasters like droughts and flooding and also to migration and pandemics. Transition risks are caused by abrupt changes in climate policies, technology and/or and consumer preferences.*

[6] *InfluenceMap (2021) found that 71% of 593 equity funds in a broad ESG category, with over USD 265 billion in total net assets, have a negative Portfolio Paris Alignment score.*

[7] *The relationship between green finance and financial system stability is complex. Sustainable investments can diversify risks, support long-term thinking, mitigate climate risks and promote transparency.*

[8] *To be released in the OeNB Reports series in German.*

environmental sustainability of financial products. Section 3 provides, on the basis of fundamental statistical variables, a descriptive analysis of factors having an impact on responses. Section 4 puts the findings into context, compares them with similar surveys, and aims to identify trends. Finally, in section 5, we draw tentative conclusions for researchers, supervisors and financial educators. Regression analysis in the annex corroborates the observations discussed in section 3.

1 Background information on the OeNB Barometer survey

The OeNB Barometer is a survey regularly conducted on behalf of the Oesterreichische Nationalbank. It is a repeated cross-sectional survey representative at both the federal and the regional levels. The OeNB Barometer we analyze was a survey of 1,431 residents of Austria aged 16 and above that was conducted by IFES from May 23 to August 16, 2022. It featured a total of 49 questions, many of which contained subquestions about further details. The main purpose of the survey is to obtain information about people's attitudes toward the OeNB and personal wealth, inflation expectations, and other economic behavior and attitudes relevant to central banks.

The survey was conducted using two methods: 953 interviews were conducted as computer-assisted personal interviews (CAPI) at the homes of respondents, and the other 478 interviews took the form of online computer-assisted web interviews (CAWI). Survey participants were selected by stratified multistage clustered random sampling; additional participants were selected at random from a permanent IFES pool.

The following demographic characteristics were surveyed: gender, age, education, profession, social class (A to E), personal and household income, size of municipality, province, media preferences, and political preferences.[9] We have weighted all results to remove effects like the overrepresentation of older cohorts in the dataset, which is due to the fact that compared to working people, senior citizens are more likely to be at home when contacted by interviewers. We are aware that the data contain many details that are beyond the scope of this short paper, and we will take a closer look at them in a full version.

2 Main survey results about green finance

This section describes the key results of the survey. Before analyzing environmental sustainability in financial markets, we will first look at climate-related income effects. Plenty of research has been conducted on the economic impact of climate change. However, we are not aware of any survey that looks at whether climate change has an impact on people's personal financial prospects. Chart 1 shows that a majority of respondents expect their financial situation to deteriorate in the next 15 years as a result of climate change.[10] As people look further into the future, larger majorities agree with that statement, which appears reasonable given scientific

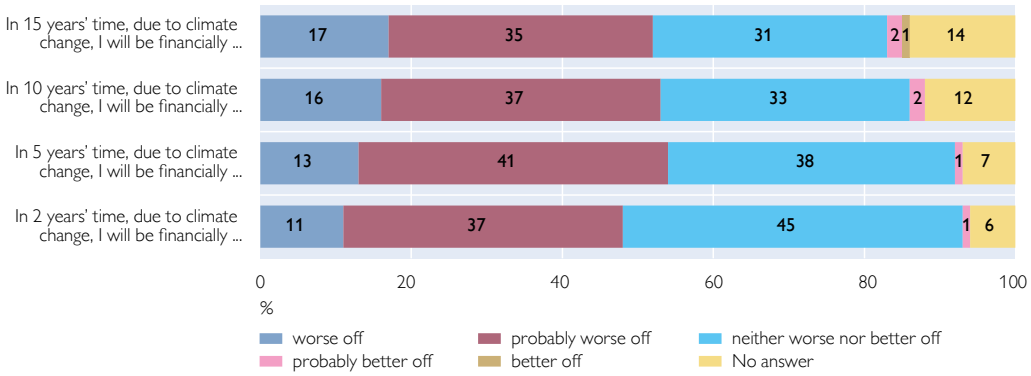
[9] *52% of respondents are female, 48% are male. On average, they are 55 years old. 75% of survey participants graduated from a secondary school and/or have completed vocational training. 17% have a university degree or equivalent. Fewer than 8% have only the minimum amount of education prescribed by law (nine years of compulsory education), or less. The average monthly net household income is approximately EUR3,028 (Siuda and Zörner, 2023).*

[10] *Unless otherwise stated, this descriptive analysis adds up the fairly positive/negative ("probably better off/worse off") and strongly positive/ negative ("better off/worse off") answers. This is done to improve comparability.*

Chart 1

Expected impact of climate change on personal financial situation

Question



Source: IFES, OeNB.

evidence about the medium- and long-term impact on productivity and capital assets. While only a relative majority of 48% expect that they will be probably or definitely financially worse off in 2 years' time, more than 50% of respondents expect to be worse off in 5, 10 or 15 years' time. However, a statistical uncertainty of 2.7% needs to be taken into account.[11] Almost no one expects climate change to improve their financial situation. Most of the other respondents say that their situation will neither improve nor deteriorate. As the questions look further into the future, the share of people giving this answer goes down.

The questions about the role of green finance are divided into two groups, with the first six questions relating more to opinions and the other eight relating more to attitudes. It is not easy to make this distinction, but it is useful: Opinions tend to be fact-based and related to specific situations, while attitudes tend to be of a more fundamental nature and often influence people's behavior.

Chart 2 shows the questions relating to opinions, some of which can also be viewed as questions about sustainable finance literacy (Gangl et al., 2023):

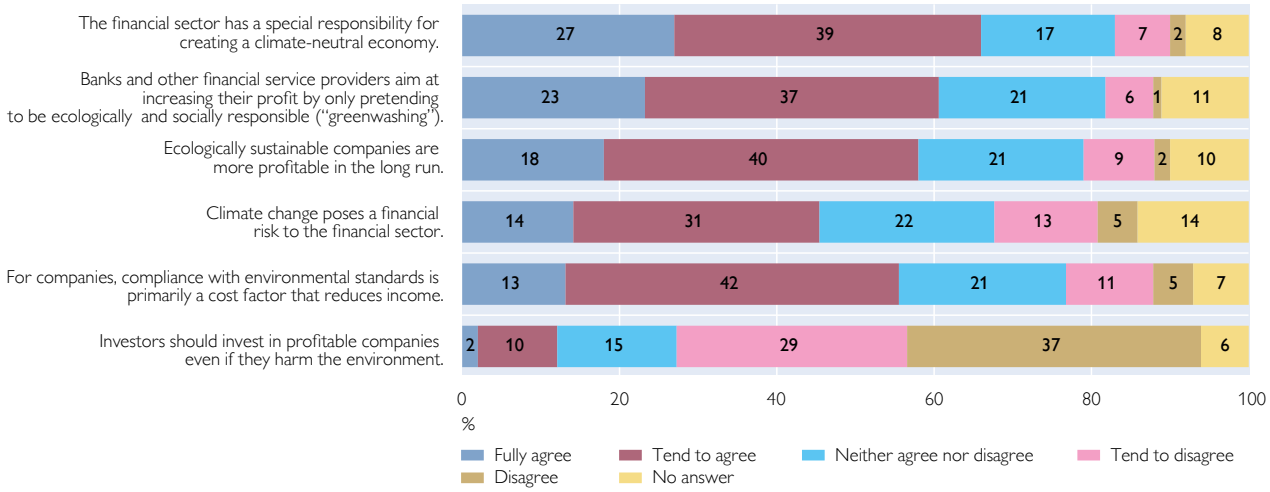
1) About two-thirds of respondents say that the financial sector has a responsibility to contribute to the transition to a low-carbon economy. This seems reasonable because the financial sector allocates resources to the wider economy, which means it has an important impact beyond its direct carbon emissions, which are quite low compared to other sectors.
2) Greenwashing appears to be a concern for 60% of respondents, who say that the financial sector cultivates an image of sustainability only in order to maximize profits. Given that the word "only" is used in an exclusive manner, it is remarkable that so many respondents agree with this statement.
3) 58% of respondents, also quite a large majority, consider sustainable businesses to be more profitable in the long run, a statement on which we have been unable to a identify a clear consensus among researchers (Atz et al., 2023).

[11] *The fact that the number of respondents expecting climate-related losses in two years (48%) is not much higher than those expecting losses in 15 years (52%) might suggest that they have static views on climate change.*

Chart 2

Opinions on sustainability in the financial sector

Question: How well do these statements reflect your views? Please give your answer on a scale of 1 to 5, where 1 is "absolutely true" and 5 is "not at all true."



Source: IFES, OeNB.

4) 45% view climate change as a financial risk, an opinion that is largely accepted by researchers, practitioners and supervisors. Only 18% of respondents take the opposite view.
5) 55% regard compliance with environmental standards mainly as a cost factor that reduces profits. The use of the word "mainly" shows a degree of inconsistency with statement 3 (sustainable businesses are more profitable).
6) However, a large majority of almost two-thirds give a negative answer to the normative control question about whether investors should focus more on profits than on protecting the environment.

All in all, opinions on green finance are positive but greenwashing and regulatory costs are identified as problems.

Next, we will analyze the questions about attitudes, which can be seen in chart 3. They differ from the questions about opinions by using the first person to refer to respondents.

1) 52% consider it important that their insurance company phase out investments in coal. In fact, a large number of insurance companies are already committed to that goal, which puts them ahead of many banks.[12]
2) An almost equal number of respondents want their bank to be climate-neutral by the middle of the century. Indeed, more and more banks are already committing to the Paris climate targets.[13]
3) A relative majority of 48% do not want their money to be invested in fossil fuels.
4) 54% prefer financial companies with clear ethical and environmental positions.

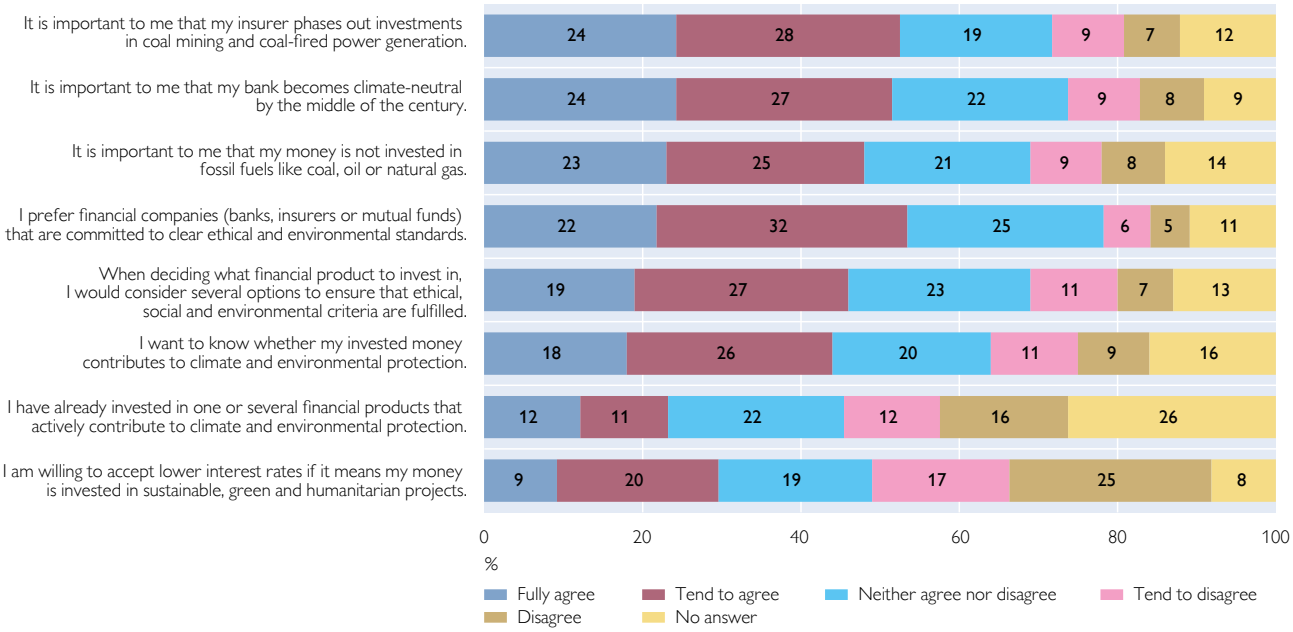
[12] *https://global.insure-our-future.com/*

[13] *https://www.bmk.gv.at/green-finance/alliance.html; https://www.unepfi.org/net-zero-banking/*

Chart 3

Opinions on sustainability in the financial sector

Question: How well do these statements reflect your views? Please give your answer on a scale of 1 to 5, where 1 is "absolutely true" and 5 is "not at all true."



Source: IFES, OeNB.

5) A relative majority of 44% want to know whether their money makes a contribution to protecting the environment.
6) However, only 46% are prepared to make an extra effort to obtain the information they need to make sure that their investment complies with sustainability criteria. This question can hence be considered to be designed to assess consistency with the answer to the previous question.
7) Only a minority of 23% say that they have already chosen to invest in low-carbon and/or green financial products; the fact that 22% answer "neither agree nor disagree" suggests that they might have difficulty understanding the question. This may also be true for the 26% that do not answer the question.
8) As many as 29% of respondents say they are prepared to accept lower returns on money invested in sustainable, green and/or humanitarian projects. However, more than 40% are not prepared to do so.

All in all, positive attitudes to green finance are somewhat less pronounced than positive opinions, which is not particularly surprising given that the former have a more specific impact on respondents' behavior. A social desirability bias, i.e. respondents providing answers that are favorably viewed by others, might also play a role, which could further reduce the validity of positive attitudes. There is a limit to the extent that people are prepared to make an effort and/or incur costs to achieve their personal green finance goals.

3 What factors shape opinions and attitudes?

The perceived economic impact of climate change and attitudes to green finance may vary by demographic and socioeconomic characteristics. As far as the former is concerned, we are particularly interested in the impact of age, especially given that current science says climate change will have a greater objective impact on younger generations. Accordingly, we are focusing on the 15-year time horizon, the most distant point in the future that the survey considers. Chart 4 shows small differences between age groups along an inverted U-shaped curve when both answers with an expected deterioration are added up (including "probably worse off").[14] While the middle cohort appears to be the most pessimistic one at 54%, the oldest cohort is the group that is least concerned at 36%, followed, surprisingly, by the youngest cohort at 42%.

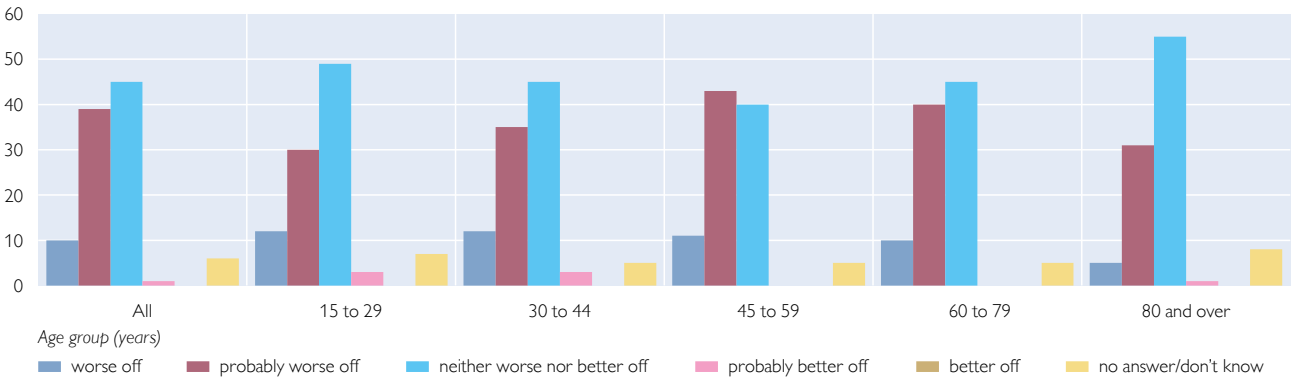
Various factors can influence people's attitudes to and interest in sustainable financial products. We will now analyze several characteristics that, based on an analysis of data in table form, appear to be meaningful in explaining differences in attitudes to green finance. Chart 5 only shows those values of the variables that separate the samples closest to their respective medians. The horizontal axis shows the percentage deviations from the average survey result for the 14 questions on opinions and attitudes.[15] In most cases, positive deviations can be interpreted as being pro-green finance.[16]

1) The income level stands out as being particularly important. We are looking at everyone up to the middle-income group that has up to EUR 2,000 in monthly personal income. On average, the answers that this group gives are 9 percentage points more pro-green finance than those of the overall sample.
2) Saving patterns also seem to play a big role but might correlate with income. We show the group that is able to save at least EUR 300 a month, according to

Chart 4

Expected impact of climate change on personal financial situation by age groups

%; question: In 15 years' time, due to climate change, I will be financially ...



Source: IFES, OeNB.

[14] *The share of people answering "neither worse nor better off" to this question is particularly high and follows a U-shaped curve, suggesting, again, that respondents might have difficulty understanding the question.*

[15] *The regression analysis in the annex omits the question about greenwashing as its answers do not unambiguously indicate whether respondents have a positive or negative attitude to green finance.*

[16] *Where the questions were worded in a negative way, we have selected the negative answers.*

the survey. The average deviation that can be interpreted as a positive attitude amounts to 7.3 percentage points.[17]

3) The level of education has somewhat less of an impact. For example, respondents with upper secondary education diplomas have a positive deviation of 4.5 percentage points.
4) Next comes gender, as the answers that women give are more pro-green finance by 2.4 percentage points compared to the overall result.
5) Status of employment appears to play a minor role. People in employment show an average deviation of 1.9 percentage points.
6) Age does not seem to have much of an impact either. We find a marginally negative deviation in the responses from people under the age of 45 (–0.7 percentage points) despite positive deviations in some questions. This is in contradiction to frequent claims that many younger people, such as millennials and Generation Z, i.e. the key supporters of the environmental movement, have a stronger interest in sustainable and green investing.[18] One possible explanation might be that younger people are mainly concerned about climate change affecting their quality of life and that they start to take a greater interest in business matters and personal finance only when they have fully entered the workforce and as their wealth grows.
7) The size of respondents' city, town or village, i.e. the rural-urban variable, is equally unimportant. For respondents living in municipalities with a population below 5,000, we see a deviation by an average of –1.4 percentage points from the overall result. A striking finding is that residents of rural areas are less prepared to accept lower returns and see climate as less of a financial risk. Conversely, people in major cities appear to have a slightly more positive stance on green finance.

These potential factors, identified by means of a descriptive approach, are, for the most part, confirmed by the regression analysis in the annex,[19] which also looks at financial literacy status that was assessed by several questions of the OeNB Barometer. The results of the survey definitely offer scope for further analysis regarding correlations with other variables as well as questions about values and convictions.

[17] *We did not include this variable in our regression analysis due to a lack of sufficient data (too many respondents failed to answer the question).*

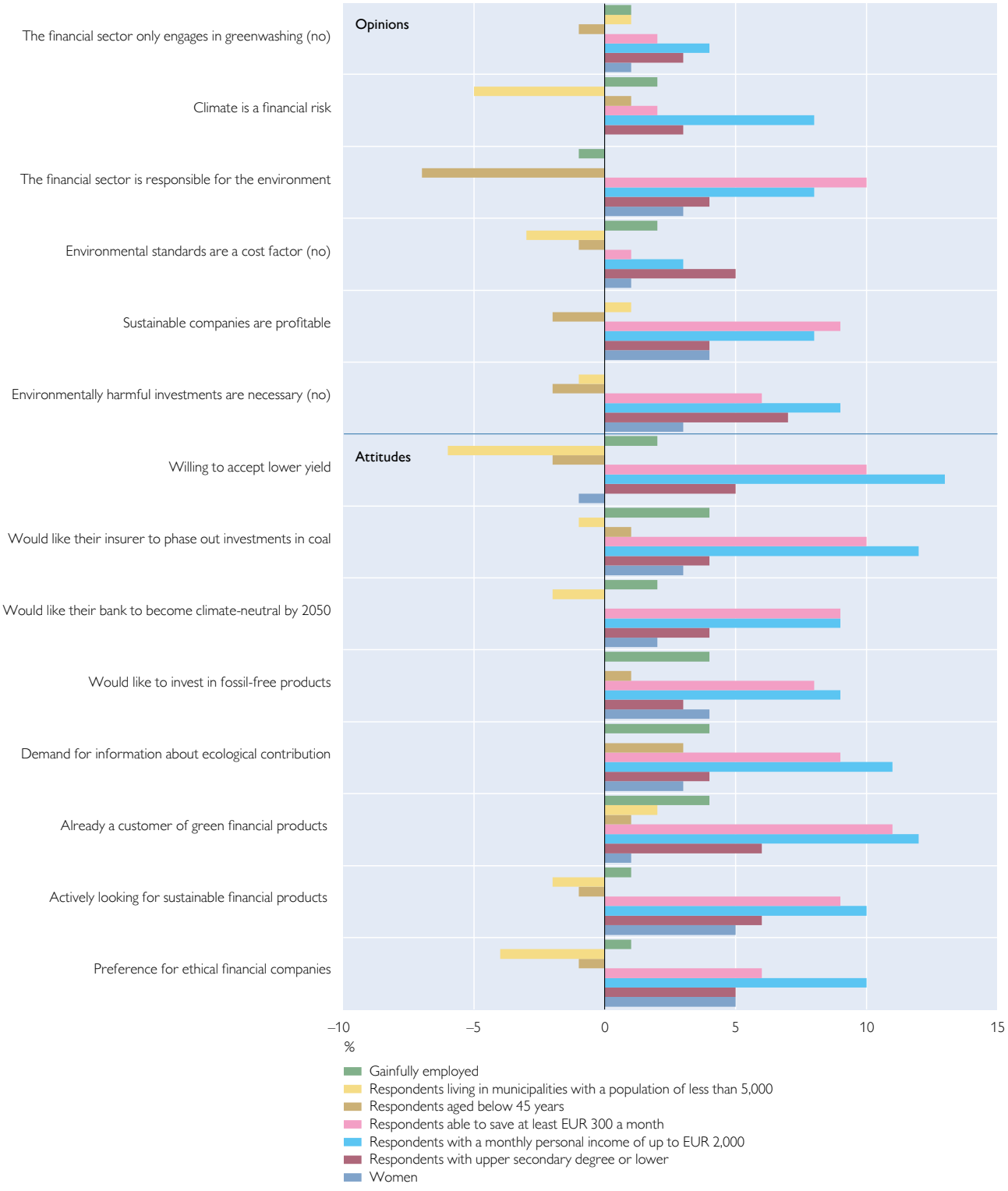
[18] *Such unexpected results might be due to misunderstanding and/or differences in motive (climate vs. financial market skepticism). We are planning to investigate the matter more thoroughly in the full version of this paper.*

[19] *To mention a small contradiction: Chart 5 and the regression analysis both show that people who completed secondary school with a qualification for university entrance and people with a university degree give pro-green finance answers, but only a university degree has an impact that is statistically significant, according to the regression analysis.*

Chart 5

Opinions and attitudes about green finance by demographic and socioeconomic factors

Deviations from survey results in percentage points; standard answer is yes
Summary of answers



Source: IFES, OeNB.

4 Comparison with similar surveys

The findings of the previous sections lend themselves to comparison with similar surveys in Austria; some studies based on these surveys were already discussed by Breitenfellner et al. (2020). Two representative household surveys conducted by Gallup (2018 and 2021) and commissioned by the Austrian Ecolabel (Österreichisches Umweltzeichen) both found that 40% of respondents consider it very important or somewhat important to take into account green and social aspects when making investment decisions.[20] Fessler et al. (2020) observed in a previous OeNB Barometer survey that more than two-thirds of respondents prefer financial companies with strong ethics.[21] This question is equivalent to the fourth question we analyzed in chart 3, where, however, only 54% of respondents gave a similar answer. The previous survey also found that the preference for ethical companies increased with age – contradicting widely-held views that millennials are very concerned about sustainability.[22] Another result was that women and people with higher levels of education were more interested in the ethical attitudes of financial companies. Looking at income, the survey found that low- and high-income earners but not middle-income earners tend to be more interested, a pattern that was not replicated by the latest OeNB Barometer survey. According to a more recent representative survey by Market Institut (2021), 61% of respondents were more or less convinced that banks should take greater responsibility in the transition toward sustainability. This is a similar percentage as in chart 2 (66%), and in both surveys, it increases with age and education. Market Institut (2021) also found that 48% want "banks to swiftly get out of the coal, oil and gas business"; the same percentage as the equivalent in chart 3 (third question).

Other surveys are not directly comparable to the OeNB Barometer survey analyzed here but do provide answers to three essential questions: To what extent are people aware of green finance? What motivates them to invest in green finance? And what is the expected impact of green finance? Gallup (2018 and 2021) found that even though awareness of sustainable financial products went up from 23% to 39%, a majority had still never heard of them. Regarding the motivation to make sustainable investments, an experimental study that Riedl and Smeets (2017) conducted in the Netherlands came to the conclusion that intrinsic social preferences (and reputation as well as, to a lesser extent, financial motives) are the main factor. This would also manifest itself in a willingness to accept lower yields, a phenomenon that was also observed in the OeNB Barometer (chart 3, final question). As for the impact of green finance, only 9% of Austrian respondents in a Eurobarometer survey (European Commission, 2020) believe that creating greener banking and insurance systems can be an effective way to address environmental problems.[23]

[20] *13% considered it very important in 2021, up from 8% in 2018.*

[21] *This survey, conducted by IFES in 2019, includes the Austrian Survey of Financial Literacy (ASFL), which contributes to OECD/INFE's International Survey of Adult Financial Literacy Competencies.*

[22] *These survey results should be treated with caution because, among other things, predefined answers and socially desirable statements can lead to bias; also, cohort effects can create myths about generations that disappear over time in longitudinal studies, and millennials are unable to test their stated preferences in practice due to a lack of excess capital.*

[23] *However, the survey gave respondents the option to choose several other methods, many of which they considered more appropriate.*

Similarly, the economists Kölbel et al. (2020) arrive at the conclusion that sustainable investing can promote good business practices but cannot "save the world" in the absence of appropriate political action. Doubts about its positive impact are not only due to greenwashing, i.e. companies more or less intentionally deceiving the public, but also due to gaps in the data and methodological complexity. This complexity is, among other things, due to the need for additionality, i.e. reductions in greenhouse gas emissions have to come on top of the decrease that would have occurred anyway in the absence of the climate action funded by sustainable investments. In addition, most investors would need to have pronounced green preferences in order to achieve a positive impact on the environment which could otherwise be canceled out by less ethical investors using arbitrage. All in all, the survey that we analyze shows that people are not very willing to accept lower returns to help the environment, which seems to indicate that most investors do not have the green preferences that would be required. However, negative attitudes to green finance can be due to two different motivations: one that is rooted in doubts about climate change and one that comes from the conviction that there are better ways to resolve the climate crisis. The regression analysis in the annex shows that positive attitudes to green finance are associated with respondents' expectations that climate change will have a negative impact on their financial situation in the future. This also suggests that negative attitudes appear to be more strongly related to climate-skeptical motivations.

5 Conclusions for research, supervision and education

Like other sustainability issues, climate change is a critical concern for financial stability as it involves various risks, including physical impacts, such as extreme weather events, as well as transition risks related to climate policy. Stranded assets, market shocks and credit risks linked to high-carbon industries further underscore the urgent need to consider sustainability in risk management. Adequate disclosure and reporting standards are crucial in addressing transparency concerns. Failure in this regard could not only jeopardize investments but also cause reputational damage and lead to stakeholder pressure.

This study mainly focuses on attitudes toward those parts of the financial sector that – at least claim to – have already adapted to the challenge. But how relevant are disappointed expectations to financial supervisors? Given the small size of the market and low premiums on green financial products (greenium), a sudden repricing of assets appears unlikely to pose a substantial risk to the stability of the financial system. Nevertheless, we cannot entirely rule out that a green speculative bubble will burst, even though a brown bubble caused by stranded fossil assets seems to be a greater risk. Moreover, the risk that unfulfilled and unrealistic promises could alienate people from financial markets also has macroeconomic relevance. This means that consumer protection has implications for growth, distribution and innovation-promoting venture capital.[24] Finally, the answers in the survey discussed in this paper also show contradictions and a lack of understanding among people. Are "green businesses more successful" or are "environmental standards mainly a cost factor"? While people want investors not to invest

[24] *An OECD (2023) report lists twelve principles providing guidance for regulators and supervisors that are responsible for financial consumer protection.*

in "companies that harm the environment," they "do not want to accept lower returns" either. In addition, many "neither/nor" and "no answer" responses do not make much sense in the context of the questions. We might revisit and interpret this imprecision in the forthcoming full version of this paper. This could require a separate analysis of the answers, depending on the coherence of the statements.

In conclusion, the results of the OeNB Barometer illustrate that attitudes to green finance are determined by a complex mix of personal convictions, economic resources and access to information. It appears that there is a considerable lack of knowledge and a gap between mere awareness and the willingness to take action. Sustainable-oriented financial literacy efforts, regulatory measures, such as the disclosures required by the EU, and voluntary labels, such as the Austrian Ecolabel, can help to build trust in effectively sustainable financial products and raise awareness of the associated risks.

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Annex

Regression analysis of factors influencing opinions and attitudes on green finance

We conduct a regression to examine whether empirical results support the descriptive analysis in section 3.[25] The regression equation is as follows:

$$index_i = age_i + age_i^2 + income_i + edu_i + female_i + finlit_i + \\ + msize_i + climatepessimist_i + \varepsilon_i$$

Index is a dependent variable measuring pro-climate views and behavior by the individuals in the sample. It is dependent on the following variables: *edu* for the level of education completed, *age* for age, *income* for income, *female* for gender, *finlit* for financial literacy, *msize* for the population of the municipality of residence, *climatepessimist* for the attitude on the financial impact of climate change; ε is the error term. We use three regression models on the basis of the following three indices:

[25] *The answers are weighted, as in the descriptive evaluation, which impacts the results only marginally.*

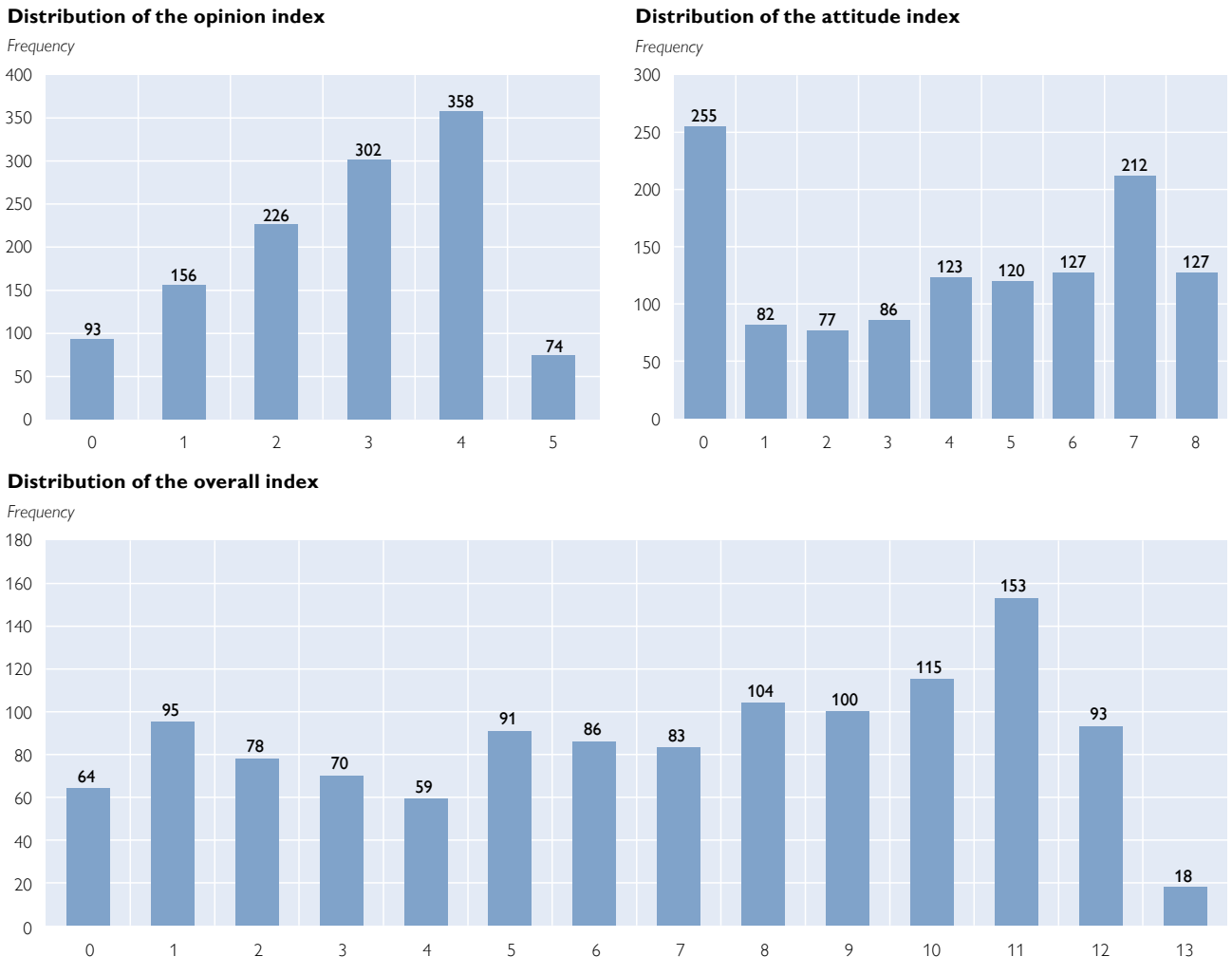
- Overall index on opinions and attitudes: the sum of all questions measuring respondents' opinions and attitudes, with one point being assigned for each "green" answer. There are a total of 13 questions, hence 13 is the maximum number of points in the index. In other words: the higher the score, the higher respondents' affinity for green finance.
- Opinions subindex: the sum of the five questions we classify as opinion questions, i.e. questions that do not imply consequences in respondents' behavior. There are a total of five questions, hence 5 is the maximum number of points in the index.
- Attitudes subindex: the sum of all eight questions we classify as attitude questions, i.e. questions that concern respondents' personal views in relation to their behavior. There are a total of eight questions, hence 8 is the maximum number of points in the index.

Descriptive statistics on the overall index and subindices

The panels of chart A1 illustrate how the frequency of answers that imply a positive stance on green finance is distributed among all respondents. More precisely, the

Chart A1

Histograms depicting the distribution of pro-green answers



Source: IFES, OeNB.

three histograms show the distribution of the overall index and the two subindices (opinions and attitudes), respectively. The x-axis shows the number of answers interpreted to be "green" in ascending order, whereas the size of the bars (y-axis) represents the frequency of the number of "green" answers.

The histograms show that by and large, the indices are evenly distributed, that is, there are no extreme concentrations that would affect a regression analysis. Looking at the histograms in greater detail, we see that the opinions subindex shows, on average, a stronger inclination toward "green" than the attitudes subindex. This seems plausible, given that, compared to opinions, attitudes imply a greater willingness to change one's own behavior. For the opinions subindex, the median is 3 out of 5 points, while the median of the attitudes subindex is 4 out of 8 points. When we merge these two indices, we obtain the overall index, whose median is 7 out of 13 points, highlighting the aggregate perspective on respondents' opinions and attitudes.

Regression results for the overall index and the subindices

Table A1 shows the regression results based on equation 1. We conducted a total of three regressions: one for the overall index, one for the opinions subindex and one for the attitudes subindex. Model 1 in the second column of table A1 shows the results for the overall index, which will be the focus of our interpretations.

The variable $income_i$ is shown as a factor variable with six categories covering individual net income intervals from EUR 0 to EUR 900, EUR 900 to EUR 1,350, EUR 1,350 to 1,650, EUR 1,950 to EUR 3,000, and over EUR 3,000. Note that all categories, except for the first three ones, are significant at the 1% level. The EUR 1,950 to EUR 3,000 category has a particularly high impact on the index. This suggests that the index increases with rising incomes up to a net income of EUR 3,000. Beyond that, the index no longer increases but goes down, approaching the level seen for the EUR 1,650 to EUR 1,950 category. This underlines how income has an impact on the index up to a certain level; after that, we see some saturation.

The variable edu_i for education describes the highest level of education achieved by respondents. *"Low secondary"* is assigned to respondents who have completed their education after nine years of compulsory schooling or after that without a qualification for university entrance; *"high secondary"* is assigned to respondents who completed school with a qualification for university entrance; *"tertiary education"* is assigned to respondents with a university degree. Model 1 suggests that a university degree has a significantly positive impact on the overall index, while all other categories are not significant. This indicates that, according to model 1, a university degree is associated with a considerable positive shift in the index; by contrast, the other education variables do not have a statistically significant impact on the index.

The dummy variable *female* denotes female respondents. The coefficient of this variable is positive in all three models, statistically significant and shifts the index by one point in model 1.

The variable *finlit* represents financial literacy and describes an index which may take values between 0 and 3 based on three questions on financial literacy, with 0 standing for no financial literacy skills at all and 3 for very good financial literacy skills. Here, "medium," that is, 2 out of 3 points, is significant, indicating a clearly positive impact on the index. This implies that, according to the model,

Table A1

Regression results for three indices

	Dependent variable		
Term	Total index, model 1 (1)	Opinion index, model 2 (2)	Attitude index, model 3 (3)
age	0.028	0.003	0.025
	(0.037)	(0.013)	(0.028)
age^2	−0.0003	0.0001	−0.0003
	(0.0003)	(0.00001)	(0.0003)
income 0-900	0.433	0.005	0.428
	(0.868)	(0.354)	(0.694)
income 900-1350	0.418	−0.208	0.626
	(0.736)	(0.308)	(0.619)
income 1350-1650	1.258	0.165	1.094*
	(0.765)	(0.311)	(0.630)
income 1650-1950	1.882**	0.301	1.580**
	(0.767)	(0.303)	(0.629)
income 1950-3000	2.670***	0.487	2.183***
	(0.726)	(0.296)	(0.603)
income 3000+	2.067***	0.545*	1.522**
	(0.791)	(0.318)	(0.656)
low secondary	−0.109	−0.108	−0.001
	(0.365)	(0.144)	(0.286)
high secondary	0.201	0.063	0.138
	(0.374)	(0.149)	(0.287)
tertiary education	1.128*	0.354*	0.775**
	(0.504)	(0.190)	(0.386)
female	1.019***	0.300***	0.720***
	(0.263)	(0.098)	(0.196)
finlit low	1.251	0.653	0.599
	(1.214)	(0.478)	(0.862)
finlit medium	2.420**	0.825**	1.595**
	(1.076)	(0.409)	(0.756)
finlit high	1.838*	0.673*	1.165
	(1.069)	(0.404)	(0.749)
msize 5000-1Mio	0.086	−0.010	0.095
	(0.294)	(0.109)	(0.218)
msize 1 Mio+	0.420	0.223**	0.196
	(0.309)	(0.112)	(0.242)
climatepessimist	1.805***	0.664***	1.141***
	(0.259)	(0.098)	(0.197)
constant	0.104	0.807	−0.702
	(1.365)	(0.541)	(1.013)
Observations	1,209	1,209	1,209
Log likelihood	−3,352.349	−2,148.086	−3,012.238
Akaike information criterion	6,742.698	4,334.171	6,062.476

Source: Authors' calculations.

*Note: *p<0.1; **p<0.05; ***p<0.01.*

better financial literacy skills are associated with a stronger positive shift in the index. That said, the level of financial literacy surveyed is very high overall, hence the differences between the categories are very small.

The variable *msize* represents the population of the municipality respondents live in. There are three categories: a population of 0 to 5,000, 5,000 to 1 million, and over 1 million (which is only Vienna). We see that the only positive coefficient is the one for the "over 1 million" category. Hence, a city of residence with more

than 1 million inhabitants (i.e. Vienna) has a positive impact on the index in our model. All other categories do not appear to have a significant impact.

The variable *climatepessimist* is a dummy variable reflecting the attitude of those who expect that climate change will adversely affect their financial situation (chart 1). It is significant at the 1% level in all three models and has a higher positive impact on the index than gender or a university degree.

Except for the regressions shown in table A1, we have conducted several regression variants excluding insignificant indicators (e.g. whether respondents have savings).[26] We did not find substantial changes in the coefficients and significance levels, which we consider to be indicative of the robustness of the results shown in the table.

In sum, the empirical results essentially support our descriptive analysis in section 3.[27] Income and education level have a high and significant impact on opinions and attitudes, with women tending toward greener attitudes. Age is not significant in all three models; financial literacy and the availability of savings seem to have a small influence on respondents' attitudes. What does seem to have a considerable impact (independent of all variables mentioned), by contrast, is whether people fear their financial situation might be adversely affected by climate change in the medium term.

[26] *Since the variable on the basis of one open question about monthly savings, which was used in chart 5, seemed unsuitable because of too few data points, we used a variable called savings in the estimation, which is based on a question about effective liquid savings (e.g. for repairs) in predefined ranges.*

[27] *Stepwise regressions could be used to check whether controlled variables would cause a change in correlations. The effect of individual regression coefficients could also be analyzed on the basis of the complete dataset, e.g. with charts showing average marginal effects, where estimated effects are displayed for individual variables. We chose not to include such a representation, given that it is possible to clearly interpret the variables' effects, and the factors impacting opinions and attitudes are discussed in section 3.*

Key financial indicators

Macroeconomic indicators for Austria

Economic indicators

https://www.oenb.at/en/Statistics/Standardized-Tables/Economic-and-Industry-Indicators/Economic-Indicators.html

Selected economic measures

https://www.oenb.at/isaweb/report.do?lang=EN&report=7.1

Interest rates and exchange rates

https://www.oenb.at/en/Statistics/Standardized-Tables/interest-rates-and-exchange-rates.html

Consumer prices

https://www.oenb.at/en/Statistics/Standardized-Tables/Prices--Competitiveness/Consumer-Prices.html

Economic sector breakdown of households

https://www.oenb.at/isaweb/report.do?lang=EN&report=801.1.2

Economic sector breakdown of nonfinancial corporations

https://www.oenb.at/isaweb/report.do?lang=EN&report=801.1.1

Property market

https://oenb.shinyapps.io/Immobiliendashboard_en/
https://www.oenb.at/en/Publications/Economics/property-market-review.html

Table A1

Bank lending

	2017	2018	2019	2020	2021	2022	H1 23
	%						
Loan growth (year on year): households	3.4	3.5	4.2	3.6	5.3	3.5	–0.3
Loan growth (year on year): residential real estate	4.8	4.4	6.1	5.5	6.9	5.0	0.0
Loan growth (year on year): corporations	4.9	6.9	6.2	5.0	8.7	9.2	6.6
	% of total loans						
Share of variable rate loans (outstanding): households	91	69	65	60	57	51	47
Share of variable rate loans (outstanding): corporations	83	72	70	69	67	67	65
Share of variable rate loans (new lending): households	56	55	51	46	47	59	55
Share of variable rate loans (new lending): corporations	83	81	82	77	86	85	84

Source: OeNB.

Table A2

Debt ratios

	2017	2018	2019	2020	2021	2022	H1 23
	%						
Household debt (relative to net disposable income)	90.7	90.3	90.1	94.7	94.4	89.9	84.1
Corporate debt[1] (relative to gross operating surplus[2])	447.1	453.4	457.8	460.8	469.2	431.5	407.3

Source: OeNB.

[1] *Short- and long-term loans, money and capital market instruments.*
[2] *Including mixed income of the self-employed.*

Indicators for the Austrian banking sector

Structural indicators

https://www.oenb.at/en/Statistics/Standardized-Tables/Financial-Institutions/banks/Number-of-Banks.html
https://www.oenb.at/en/Statistics/Standardized-Tables/Financial-Institutions/banks/banks-business-structure.html

Table A3

Consolidated banking data

	2017	2018	2019	2020	2021	2022	H1 23
	EUR billion						
Total assets	949	986	1,032	1,136	1,197	1,200	1,232
Loans	668	704	744	752	787	814	836
Shares and debt instruments	139	138	137	143	147	155	170
Cash balance and deposits at central banks	71	75	75	164	186	161	157
Deposits by nonbanks	559	584	615	656	686	709	717
Deposits by credit institutions	101	103	101	102	106	106	131
Debt instruments issued	120	141	150	153	152	163	186
Profit	6.6	6.9	6.7	3.7	6.1	10.2	7.3
Operating income	22.8	24.0	25.0	24.8	25.8	31.6	18.3
Operating costs	14.8	15.7	16.7	16.5	16.8	18.7	9.2
Operating profit	8.1	8.4	8.3	8.2	9.0	12.9	9.1
Risk costs	1.0	0.4	1.0	3.7	1.4	2.7	0.8
Key ratios	%						
Common equity tier 1 (CET1) ratio	15.6	15.4	15.6	16.1	16.0	16.3	16.6
Leverage ratio	7.3	7.5	7.6	7.4	7.7	7.9	7.9
Return on assets (annualized)	0.8	0.8	0.7	0.4	0.6	0.9	1.3
Cost-to-income ratio	65	65	67	67	65	59	50
Nonperforming loan (NPL) ratio[1]	3.4	2.6	2.2	2.4	2.1	2.1	2.0
Coverage ratio	52	51	49	49	48	46	45
Liquidity coverage ratio (LCR)	155	147	142	174	175	157	161
Net stable funding ratio (NSFR)	119	120	119	129	128	124	126

Source: OeNB.

[1] *As of 2020, the NPL ratio excludes cash balances at central banks and other demand deposits.*

Table A4

Unconsolidated banking data[1]

	2017	2018	2019	2020	2021	2022	H1 23
	EUR billion						
Total assets	815	855	885	974	1,024	1,014	1,023
Loans	596	627	654	669	700	730	716
Shares and debt instruments	94	93	94	95	93	104	126
Cash balance and deposits at central banks	42	51	50	123	141	102	104
Deposits by nonbanks	403	426	444	474	496	505	510
Deposits by credit institutions	164	168	166	217	240	213	201
Debt instruments issued	117	128	137	140	140	160	184
Profit	4.9	5.7	4.8	2.7	6.5	5.0	6.6
Operating income	19.5	19.4	19.7	19.3	21.2	23.7	12.9
Operating costs	12.9	13.3	14.2	13.6	14.2	14.0	5.8
Operating profit	6.6	6.1	5.5	5.7	6.9	9.7	7.1
Risk costs	0.9	0.3	0.2	2.5	–0.4	3.6	–0.1
Key ratios	%						
Return on assets (annualized)	0.6	0.7	0.6	0.3	0.7	0.5	1.3
Cost-to-income ratio	66	68	72	71	67	59	45
Nonperforming loan (NPL) ratio (Austria)	2.5	2	1.7	1.5	1.4	1.3	1.4
Coverage ratio (Austria)[2]	60	62	61	68	70	74	71
Liquidity coverage ratio (LCR)	153	144	142	174	171	155	158
Net stable funding ratio (NSFR)	118	120	120	129	129	124	127

Source: OeNB.

[1] *As of 2023 and due to reporting changes, comparability to previous years' data is limited.*
[2] *Total loan loss provisions as a percentage of NPLs in domestic business.*

Table A5

CESEE subsidiaries

	2017	2018	2019	2020	2021	2022	H1 23
	EUR billion						
Total assets	206	207	223	234	271	279	294
Loans	137	147	161	165	186	184	196
Shares and debt instruments	38	37	38	42	48	49	55
Cash balance and deposits at central banks	26	18	18	22	30	39	36
Deposits by nonbanks	150	154	167	178	205	211	220
Deposits by credit institutions	25	23	22	16	18	18	22
Debt instruments issued	4	4	5	11	15	12	16
Profit	2.6	2.9	2.8	1.9	3.0	5.2	2.7
Operating income	7.9	7.9	8.4	8.2	8.9	12.8	6.5
Operating costs	4.2	4.1	4.4	4.4	4.6	5.1	2.9
Operating profit	3.7	3.8	4.1	3.8	4.3	7.7	3.6
Risk costs	0.3	0.2	0.5	1.3	0.5	1.0	0.3
Key ratios	%						
Return on assets (annualized)	1.3	1.4	1.3	0.8	1.2	1.9	1.9
Cost-to-income ratio	53	51	52	54	52	40	44
Nonperforming loan (NPL) ratio[1]	4.5	3.2	2.4	2.6	2.2	2.1	1.9
Coverage ratio	61	64	67	67	64	64	63

Source: OeNB.

[1] *As of 2020, the NPL ratio excludes cash balances at central banks and other demand deposits.*

Table A6

Financial stress indicators

	2017	2018	2019	2020	2021	2022	H1 23
	Indicator value						
Austrian financial stress indicator (AFSI)	–0.71	–0.24	–0.72	–0.57	–0.66	0.67	–0.03
Composite indicator of systemic stress (CISS)	0.03	0.07	0.02	0.10	0.05	0.33	0.26

Source: OeNB, ECB.

Indicators for other financial intermediaries in Austria

Mutual funds

https://www.oenb.at/en/Statistics/Standardized-Tables/Financial-Institutions/Mutual-Funds.html

Pension funds

https://www.oenb.at/en/Statistics/Standardized-Tables/Financial-Institutions/pension-funds.html

Insurance corporations

https://www.oenb.at/en/Statistics/Standardized-Tables/Financial-Institutions/insurance_corporations.html