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How interest rate-sensitive is Austrian banks' net interest income?

Using Austrian bank-level data, we replicate Drechsler, Savov and Schnabl (2021), who find that banks largely insulate net interest margins (NIMs) from short-term interest rate changes by matching the interest rate sensitivity of assets and liabilities. We broadly confirm this result for Austria before 2020. However, estimated NIM sensitivities increase substantially if we include the latest monetary tightening cycle. Most likely, this reflects banks' high excess liquidity and the exceptionally low interest rates prevailing at the onset of the cycle.

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Austrian banks' interest income and expenses prove sensitive to interest rates

Our estimates show that Austrian banks' interest income and interest expenses react more strongly to changes in short-term interest rates than those of their US peers.



Austrian banks' NIM sensitivity was low before 2020

Historically, the sensitivities of interest income and expenses of Austrian banks (especially large institutions) matched closely, which resulted in little systematic NIM exposure to interest rate changes.



But NIM sensitivity increased with the latest monetary tightening cycle

Recently, weaker income-expense matching has increased Austrian banks' NIM sensitivity to interest rates. High excess liquidity and low interest-rates at the beginning of the cycle are plausible explanations.

The views expressed are those of the authors and do not necessarily reflect those of the Oesterreichische Nationalbank or the Eurosystem.

Introduction

Austrian banks' net interest margins (NIMs) remained remarkably insensitive to interest rate fluctuations during the first two decades of the 2000s. As shown in chart 1, neither the median nor the asset-weighted mean of Austrian banks' NIMs responded strongly to the interest rate cycles between 2000 and 2004 and between 2005 and 2009. While the median broadly tracked the long-term decline in interest rates, the mean remained largely stable and close to the lower end of the distribution.[1]

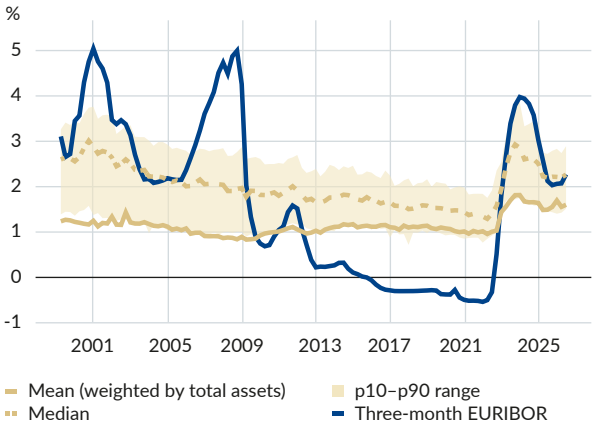
In contrast, during the latest interest rate cycle that began in 2022, both the median and the asset-weighted mean increased sharply, alongside the most rapid monetary tightening episode in the history of the euro area. The resulting increase in bank profitability contributed materially to the record earnings in the Austrian banking sector. This raises an important question: Have Austrian banks become more sensitive to changes in interest rates?

The question is particularly relevant in light of the contribution of Drechsler, Savov and Schnabel (2021, in the following DSS). DSS show that, from 1984 to 2017, US banks closely matched the interest rate sensitivity of their interest-bearing assets (interest income beta) to that of their interest-bearing liabilities (interest expense beta) and as a result, their net interest income displayed no systematic sensitivity to interest rate changes. This suggests that US banks are largely unexposed to interest rate risk despite their large maturity mismatch resulting from mostly financing longer-term lending with short-term deposits. DSS explain this by the special behaviour of retail deposits, which – like long-term fixed-rate liabilities – react only sluggishly to movements in interest rates despite their very short-term maturity and thus hedge interest rate risk arising from long-term fixed-rate assets.

The Austrian banking system provides an interesting testing ground for this hypothesis. Austrian banks have historically displayed relatively stable NIMs despite significant maturity transformation and a comparatively high prevalence of variable rate lending. At the same time, the recent interest rate hiking cycle differed from previous episodes in several important respects. Policy rates increased more rapidly than at any point in euro area history, banks entered the cycle with unprecedented levels of excess liquidity and large holdings of remunerated central bank reserves created additional channels through which rising interest rates could affect bank profitability.

Chart 1

Net interest margin of Austrian banks



Source: Authors' calculations; ECB.

Recent Austrian evidence points to substantial repricing asymmetries during this period. Breyer et al. (2023) show that lending rates adjusted considerably faster than deposit rates, resulting in a marked increase in bank profitability. More generally, Ferstl et al. (2023) document a largely complete long-run pass-through from money market rates to lending rates and term deposit rates, while highlighting the sluggish adjustment of overnight deposits. Kerbl and Sigmund (2016) and Agati and Sigmund (2025) show that the negative-rate period altered banks' pricing behaviour and changed the relationship between retail rates and money market rates. Taken together, these studies suggest that the transmission of monetary policy through banks may also depend on the prevailing interest rate environment.

[1] The largest banks, which largely determine the asset-weighted mean, typically exhibit lower NIMs due to their greater reliance on market-based funding on the liability side.

This interpretation is consistent with recent work on state-dependent monetary policy transmission. Eichenbaum et al. (2025) show that the response of banks' NIMs to monetary policy shocks differs substantially depending on whether monetary tightening occurs after a prolonged period of low or high interest rates. Their results imply that the profitability effects of monetary policy may vary across monetary policy regimes rather than remain constant over time.

To determine Austrian banks' sensitivity to interest rate changes, we investigate the following aspects:

First, rather than analysing lending and deposit pricing directly, we focus on realised interest income and interest expense recorded in banks' financial statements. The distinction is important. Product-level lending and deposit betas capture the repricing behaviour for individual banking products. Our accounting-based betas capture the cumulative balance sheet consequences of repricing and therefore link monetary policy transmission directly to bank profitability.

Second, we apply the DSS framework to Austrian supervisory data and investigate whether the relationship between interest income and expense sensitivities changed when the recent interest rate hiking cycle is incorporated into the estimation sample.

Data and methodology

Our analysis uses quarterly unconsolidated supervisory data for Austrian banks covering the period from Q4 98 to Q2 26. Unconsolidated reporting provides broader institutional coverage and thus a larger cross-section of banks for estimation. Following the methodology employed by DSS, we estimate interest rate sensitivities separately for each bank using time series regressions. Only banks with at least 60 consecutive quarterly observations are retained in the sample, corresponding to at least 15 years of data per bank. This threshold ensures sufficiently long time series for reliable bank-level estimation. After applying these constraints, our sample covers 697 Austrian banks and a total of 66,733 observations.

Interest income, interest expenses and net interest income (interest income minus expenses) are scaled by average assets and annualised. We then estimate the following specification for each bank i:

$$\Delta Y_{it} = \alpha_i + \beta_{i,0}\Delta r_t + \beta_{i,1}\Delta r_{t-1} + \beta_{i,2}\Delta r_{t-2} + \beta_{i,3}\Delta r_{t-3} + \varepsilon_{it}$$

where Y_{it} denotes either interest income divided by assets, interest expenses divided by assets or net interest income divided by assets, and r_t represents the three-month EURIBOR, where daily data are averaged over the corresponding quarter. Following DSS, we allow for three lags of interest rate changes to capture the cumulative effect of interest rate changes over a full year, which makes our results directly comparable to those of DSS.[2]

The bank-specific betas are then computed as the sum of the contemporaneous and lagged coefficients for interest income, interest expenses and net interest income, respectively:

$$\beta_i = \sum_{\tau=0}^{3} \beta_{i,\tau}.$$

The resulting betas can be interpreted as the cumulative response of income or expenses to a 100 basis-point change in the reference rate over a one-year horizon. For example, an income beta of 0.50 implies that a 100-basis point increase in the three-month EURIBOR is associated with a 50-basis point increase in annualised interest income relative to assets.

[2] Results are robust to using the one-month EURIBOR or ECB rates like the deposit facility rate (DFR). DSS motivate the use of the one-year estimation window by the impulse responses of interest income and interest expense rates to changes in interest rates, which take about one year to build up and then flatten out.

The estimated beta distributions are winsorised at the 1st and 99th percentiles to reduce the influence of extreme observations.

To assess the influence of the recent interest rate hiking cycle, we estimate betas separately for

1) a pre-pandemic subsample ending in Q4 19 and

2) the full sample ending in Q2 26.

A direct post-pandemic estimation is not feasible because the available period contains only 26 quarterly observations, which is insufficient for reliable bank-level beta estimation.

Results

Interest rate sensitivity of Austrian vs US banks

Table 1 shows the unweighted averages of the estimated bank betas, including their standard errors. The left-hand panel shows figures for the pre-pandemic subsample from 1998 to 2019. Our first finding is that Austrian banks generally exhibit higher interest rate sensitivities than those reported for US banks by DSS. In the pre-pandemic subsample, the unweighted average of income betas is approximately 0.49, while the corresponding expense beta average equals roughly 0.43. In contrast, DSS report values of approximately 0.35 for both income and expense betas of US banks from 1984 to 2017. One explanation for the higher interest rate sensitivity of Austrian banks could be that the assets of US banks are more long term and fixed rate compared to those of Austrian banks.

Table 1

Average beta estimates

Panel A: all banks

	Pre-pandemic		Full sample	
	Mean	Standard deviation	Mean	Standard deviation
	(1)	(2)	(3)	(4)
Interest rate sensitivity				
Interest income beta	.493	.173	.530	.166
Interest expense beta	.428	.137	.406	.132
NIM beta	.062	.112	.123	.120
Sample				
Number of observations		53,696		64,642
Number of banks		697		697

Panel B: largest 10% of banks

	Pre-pandemic		Full sample	
	Mean	Standard deviation	Mean	Standard deviation
	(1)	(2)	(3)	(4)
Interest rate sensitivity				
Interest income beta	.530	.253	.550	.233
Interest expense beta	.508	.221	.499	.182
NIM beta	.019	.109	.056	.124
Sample				
Number of observations		5,528		7,048
Number of banks		70		70

Note: Averages reported are calculated from individual bank estimates winsorised at the 1% and 99% level. The full estimation sample contains 64,642 quarterly observations due to the inclusion of three lags in the model specification. The largest 10% of banks are selected according to the lifespan average of inflation-adjusted total assets.

Source: Authors' calculations.

The key result of DSS is that US banks closely align the interest rate sensitivities of their interest income and expense streams, and thus their NIM betas are close to zero. In practical terms, this implies that a bank with low liability-side sensitivity to interest rate changes (e.g. because it relies heavily on retail deposits that adjust only sluggishly to changes in policy rates) will also tend to hold assets whose returns reprice slowly, such as long-term fixed-rate loans. As a result, the bank closely matches the sensitivity of its interest income and interest expense streams. At the other end of the spectrum, a bank whose funding costs respond more rapidly to changes in short-term interest rates (e.g. because it relies more heavily on market-based funding) is predicted to hold a greater share of short-term or variable rate loans. Such a balance sheet structure ensures that increases in funding costs are offset by corresponding increases in interest income.

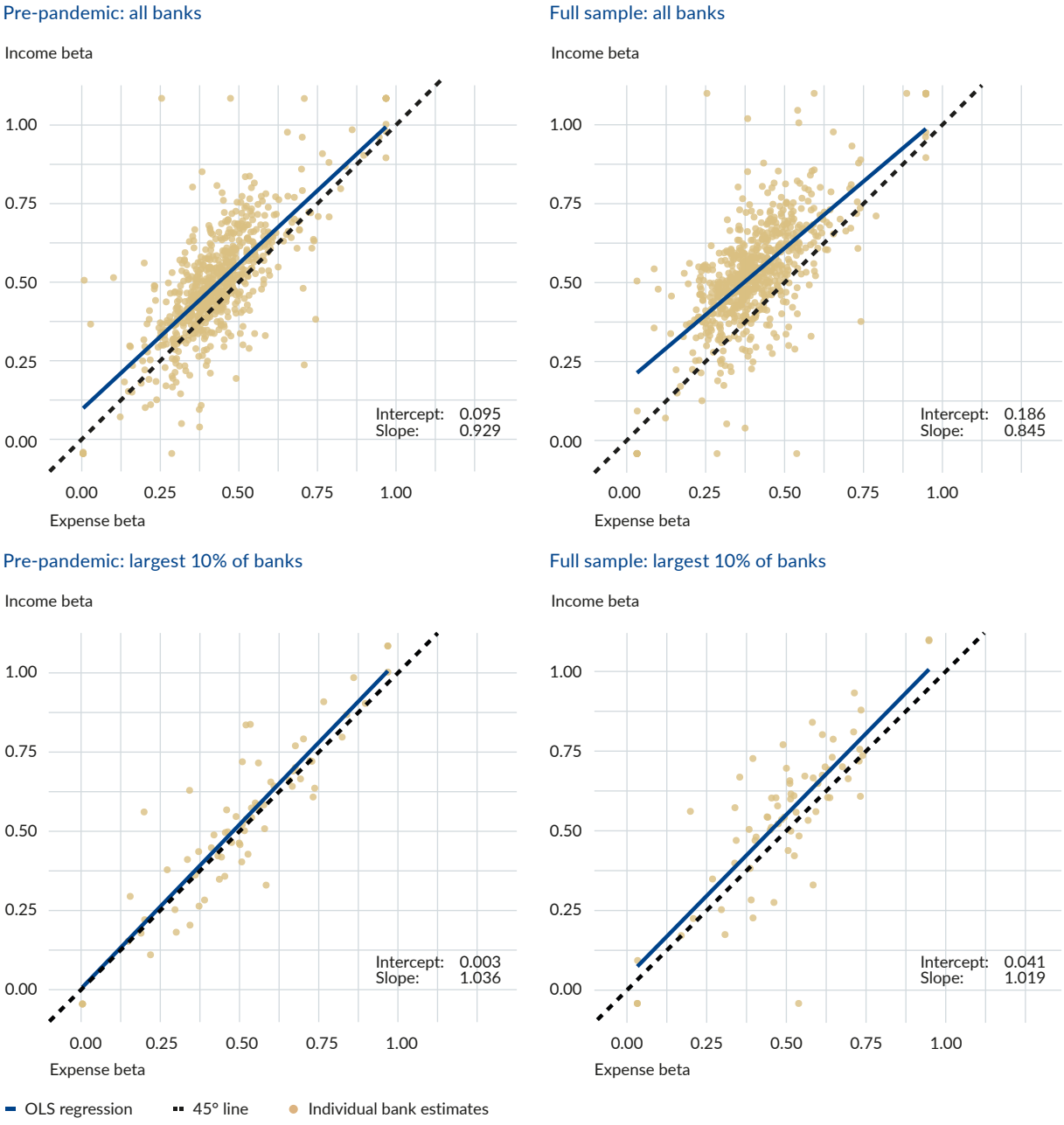
As table 1 shows, the DSS result for US banks is most closely mirrored by the net interest income sensitivity of the largest Austrian banks in the pre-pandemic subsample, which is the period most comparable with the DSS sample period. The difference between the means of bank-level interest income betas (0.49) and interest expense betas (0.43) of all Austrian banks in the sample is larger than in DSS, who report 0.35 for both. However, income and expense betas for the largest 10% of Austrian banks (covering 82% of total assets) are much closer together (0.53 and 0.51), implying NIM sensitivities close to zero (0.019). For the largest 5% of Austrian banks (covering 73% of total assets), both income and expense sensitivities are essentially identical (both 0.50), resulting in a NIM beta of 0.0002. These findings are consistent with the DSS hypothesis. Prior to the latest interest rate cycle, large Austrian banks appear to have matched their interest income and interest expense sensitivities sufficiently closely to eliminate systematic NIM exposure to interest rate changes.

The matching between interest income and expense sensitivities can also be visualised in a plot of income betas against expense betas. The left-hand panels in chart 2 shows individual bank estimates from the pre-pandemic subsample, where each dot represents one bank. Under the DSS prediction, observations should cluster around the 45-degree line (dashed line). The upper left-hand panel shows the results for all Austrian banks while the lower left-hand panel focuses on the largest 10% of banks.

The pre-pandemic sample reveals strong matching, particularly among large banks. With a slope coefficient of 1.04 and an intercept of 0.00, the estimated regression line for the largest 10% of banks lies almost directly on top of the 45-degree line, indicating near-perfect matching between interest income and expense sensitivities. This result closely mirrors evidence documented by DSS. Considering all banks, we obtain a slope coefficient of 0.93 with an intercept of 0.10, indicating substantial although not full insulation from interest rate movements.

Chart 2

Bank-level beta estimates



Note: Individual bank estimates are winsorised at the 1% and 99% percentiles.
Source: Authors' calculations.

Did NIM sensitivity change with the latest interest rate cycle?

Now we turn to the question of whether the net interest income of Austrian banks has become more sensitive to changes in interest rates since the latest interest rate cycle. To answer this question, we compare our previous results for the pre-pandemic period to the results obtained for the full sample. Our main finding is that the inclusion of the most recent monetary tightening cycle increases estimated NIM sensitivities, driven particularly by the asset side of balance sheets.

As table 1 shows, for all banks, the average income beta rises from 0.49 in the pre-pandemic subsample to 0.53 for the full sample, while the average expense beta declines from 0.43 to 0.41. Consequently, the

average NIM beta doubles from approximately 0.06 to 0.12. For the largest 10% of banks, the average income beta increases from 0.53 to 0.55 while the expense beta decreases from 0.51 to 0.50. While these changes appear smaller in magnitude compared to the full sample, the NIM beta increases by a much larger factor: From 0.019 in the pre-pandemic subsample, it increases three-fold to 0.059. For the largest 5% of banks, the average NIM beta increases from 0.0002 pre-pandemic to 0.040 in the full sample.

Chart 2 conveys a similar message. A comparison of the scatterplots of the bank-level estimates for the pre-pandemic subsample and the full sample shows that including the most recent tightening cycle shifts the distribution of bank-level estimates upward and slightly leftward, further away from the 45-degree line. This pattern, which is visible both in the panel with all banks and the panel with the largest 10% of banks only, implies a growing divergence between income and expense betas following the inclusion of the latest interest rate cycle.

A higher sensitivity of the NIM to interest rate changes since the latest interest rate cycle is also supported by comparing how many banks have NIM betas significantly different from zero in the pre-pandemic subsample and the full sample. While in the pre-pandemic subsample, 652 institutions or 93.5% of all banks exhibit a NIM beta not significantly different from zero, these figures drop to 571 institutions or 81.9% when including the latest interest rate cycle. For the largest 10% of banks, the figures decline from 94.3% (66 out of 70 banks) in the pre-pandemic subsample down to 81.4% (57 out of 70 banks) in the full sample.

These findings complement the results of Breyer et al. (2023). Their evidence of unusually low deposit pass-through during the recent interest rate hiking cycle implies that banks were able to maintain a large stock of comparatively inexpensive deposit funding while asset yields adjusted upward. In our framework, these developments appear as a widening gap between interest income and expense betas and consequently as larger NIM sensitivities.

Discussion

The Austrian evidence paints a nuanced picture of the DSS hypothesis. Prior to 2020, the near-neutrality of banks' NIMs to interest rate changes found by DSS was most evident among large Austrian banks. Once the recent monetary tightening cycle is taken into account, however, this result weakens substantially. Several factors may help explain why NIM sensitivities increased with the latest interest rate cycle.

First, Austrian banks entered the most recent interest rate cycle with unprecedented levels of excess liquidity and therefore a lower need to attract retail deposits for financing. This may help explain the unusually low pass-through of rising market rates to retail deposit rates in the latest interest rate cycle. At the same time, banks directly benefited on the asset side from higher interest payments on excess reserves held with the central bank.

Second, (Eichenbaum et al., 2025) emphasise the importance of the exceptionally low and, at times, negative interest rate environment prevailing before the latest monetary tightening cycle. They argue that, as the effective zero lower bound on retail deposit rates limited the pass-through of negative policy rates to depositors, depositors were more willing to accept low deposit rates when interest rates turned positive again. Consequently, monetary tightening following prolonged periods of low or negative interest rates can lead to substantially larger increases in banks' NIMs than tightening cycles that start from a positive interest rate environment.

Whether the increase in estimated NIM sensitivities documented in this study merely reflects the unique characteristics of the latest monetary tightening episode or marks a more persistent change in Austrian banks' NIM sensitivities remains to be seen.

An important limitation of the present analysis is that it focuses on aggregate interest income and interest expenses rather than their individual components. Consequently, the results cannot identify which specific income statement positions drove the increase in estimated income and expense sensitivities during the latest tightening cycle. On the income side, relevant questions include the relative contribution of traditional lending activities, securities portfolios and the remuneration of excess reserves held with the Eurosystem. On the expense side, it remains unclear to what extent the observed developments were driven by overnight deposits, term deposits, debt securities or other funding instruments.

Given the relevance of these questions for understanding the recent increase in Austrian banks' profitability, a decomposition of income and expense sensitivities into their underlying components appears warranted. Such an analysis would provide a more granular understanding of the drivers of the recent rise in NIM sensitivities and help assess whether the observed changes primarily reflect cycle-specific factors or more persistent structural developments. A detailed investigation of these channels is beyond the scope of the present study but represents a promising avenue for future research.

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