Short economic – financial analyses

Is the ECB monetary tightening effective? The role of bank funding and asset structure

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March 2023

BANKA SLOVENIJE
EVROSISTEM

Collection: Short economic – financial analyses

Title: Is the ECB monetary tightening effective? The role of bank funding and asset structure

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Issue: March 2023

Place of publication: Ljubljana

Issued by:
Banka Slovenije
Slovenska 35, 1505 Ljubljana, Slovenia
www.bsi.si

Electronic edition:
https://bankaslovenije.blob.core.windows.net/publication-files/kea-is-the-ecb-policy-effective.pdf

Kataložni zapis o publikaciji (CIP) pripravili v Narodni in univerzitetni knjižnici v Ljubljani

COBISS.SI-ID 144751619

ISBN 978-961-6960-74-8 (PDF)

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This paper analyses the transmission of the ECB policy rate to bank deposit rates. From June to December 2022, the policy rate increased by 2.5 percentage points, while deposit rates in euro area banks increased only by 0.2 percentage point. The pass-through was not perfect even in the previous cycle between 2005 and 2008, but it was nevertheless much higher compared to the recent one. I show that the two main factors behind the sluggish response in deposit rates are the sizeable amounts of deposits and liquidity in banks' books. These effects are undesirable and work against ECB's efforts to restore price stability by tightening monetary policy.

1 Introduction

In response to the high inflation in the euro area, the ECB started raising key policy rates in July 2022.

In the middle of 2021, the inflation rate in the euro area started to rise, and by December 2022, it had surged to 9.2%, a level well above the ECB's target of 2%. In response, the ECB started tightening its stance in December 2021, when it announced a step-by-step reduction in the pace of asset purchases.[1] In July 2022 the ECB increased key policy rates for the first time since 2011,[2] which was followed by three additional rate hikes, resulting in an overall increase of 2.5 percentage points by end of 2022.

Lending and, especially, deposit rates show only a muted response to policy rate increases so far.

The increase in policy rate has fully transmitted to an increase in market rates, whereas lending and, especially, deposit rates have shown only a muted response so far. This is undesirable in the current conditions of high inflation, as the loan demand decreases by less than might be anticipated by policy rate hikes and, at the same time, low deposit rates incentivise consumption instead of saving.

[1] Monetary policy decisions, 16 December 2021. Net asset purchases under the asset purchase programme further shifted down from April 2022 and concluded in June 2022.

[2] Monetary policy decisions, 21 July 2022.

This paper analyses the drivers of the low transmission of policy rate to deposit rates.

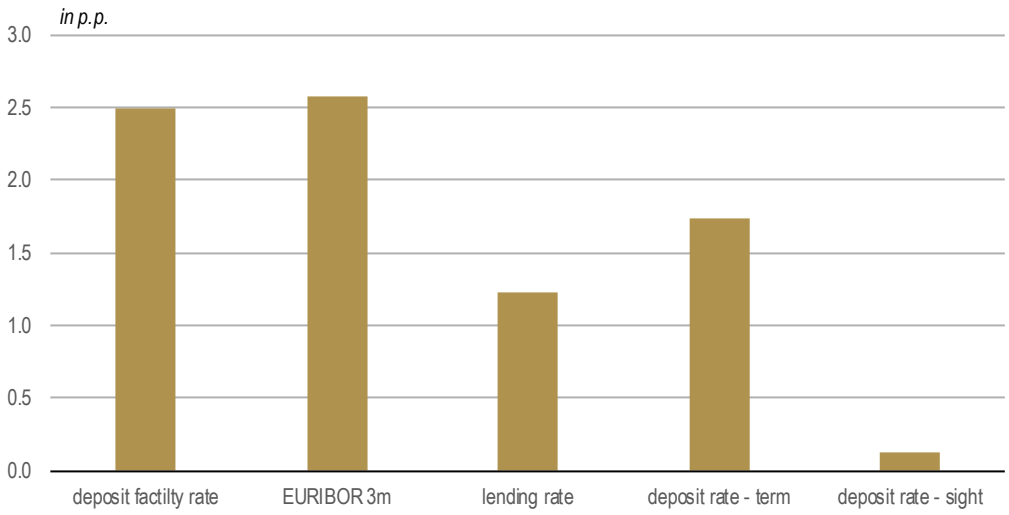
I compare the pass-through in the current policy hike cycle with two previous ones in 2011 and 2008. For this purpose, I use bank-level data for a large sample of euro area banks, covering around 80% of the eurosystem's total assets. The analysis uses data from up to the end of December 2022, when the deposit facility rate stood at 2%.

The results of my analysis touch upon the effectiveness of the interest rate channel (Mishkin, 1996; Boivin et al., 2010) and the bank lending channel (Bernanke et al., 1991; Kashyap and Stein, 2000; Altavilla et al., 2020), which is one of the crucial propagation channels in the euro area. According to the results, both channels could currently be significantly impaired in the euro area as, in the presence of high amounts of deposits and liquidity, banks adjusted their deposit rates only marginally. This does not incentivise saving and at the same time results in a lower transmission of policy rate to lending rates.

2 Policy rate transmission to bank lending and deposit rates

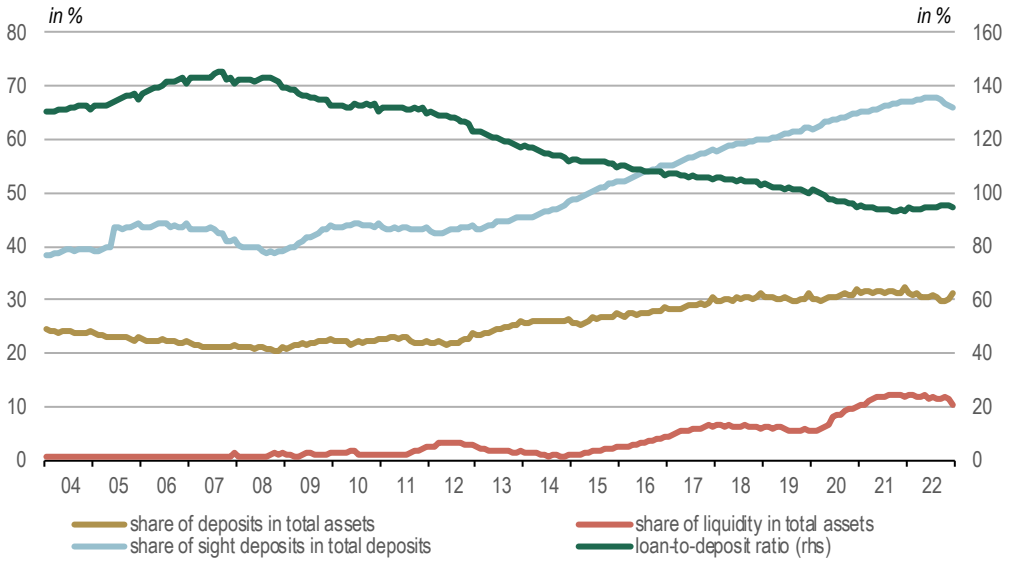
From June to December 2022, the policy rate increased by 2.5 percentage points, which fully transmitted to an increase in EURIBOR (see Figure 1). Over the same time period, lending and deposit rates for new businesses increased only by 1.2 percentage point and 0.2 percentage point respectively.

Figure 1: **Rate increases from June to December 2022**



Note: The figure shows increase in rates between June 2022, which is one month before the initial rate hike, and December 2022.
Source: ECB, MIR, own calculations.

Figure 2: **Features of bank funding and assets structure**



Note: Loan-to-deposit ratio is a ratio between the outstanding amount of loans to NFCs and households and their deposits. Liquidity are banks' holdings at their ECB accounts.
Source: ECB, MIR, own calculations.

The current pass-through of policy rate to bank lending and deposit rates is much more sluggish compared to the last rate hike cycle.

Between November 2005 and July 2008, the ECB policy rate[3] increased by 2.25 percentage points, which led to a 2 percentage points increase in lending rate and a 1 percentage point increase in deposit rate (Figure 3). Although the pass-through was not perfect even in the previous cycle, it was nevertheless much higher compared to the recent one (Figure 4). The main difference stems from a very sluggish response in deposit rates, which in turn allows banks to keep lending rates lower.

The rate of remuneration on sight deposits is low and responded negligibly to the recent hikes in policy rate.

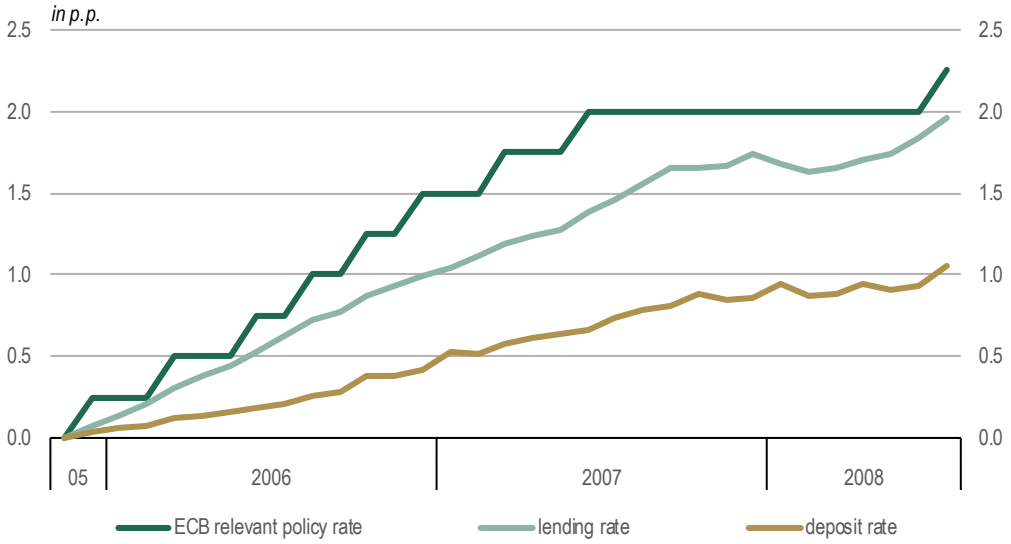
The long period of low interest rates discouraged households and firms from locking their savings with a bank for a longer period. As a result, 66% of deposits are currently sight deposits, as opposed to around 40% until 2014, when a large package of non-standard measures was announced (Figure 2).[4] The rate of remuneration on sight deposits is low and responded negligibly to the recent hikes in policy rate (Figure 1), possibly reflecting an attempt by banks to recoup part of the lost margins experienced during the negative rate period.[5]

[3] ECB relevant policy rate is the main refinancing operations (MRO) rate for the 2005-2008 cycle, when banks operated with a low amount of liquidity, and the deposit facility rate (DFR) for 2022 rate hikes, when banks are having a substantial amount of liquidity deposited at their central bank accounts (see Figure 2).

[4] In mid-2014 the ECB announced the start of an asset purchase programme (APP) as well as the first series of targeted longer-term refinancing operations (TLTRO).

[5] Banks were reluctant to pass negative rates to depositors, especially to households (Heider et al., 2019).

Figure 3: **2005-2008 tightening cycle**

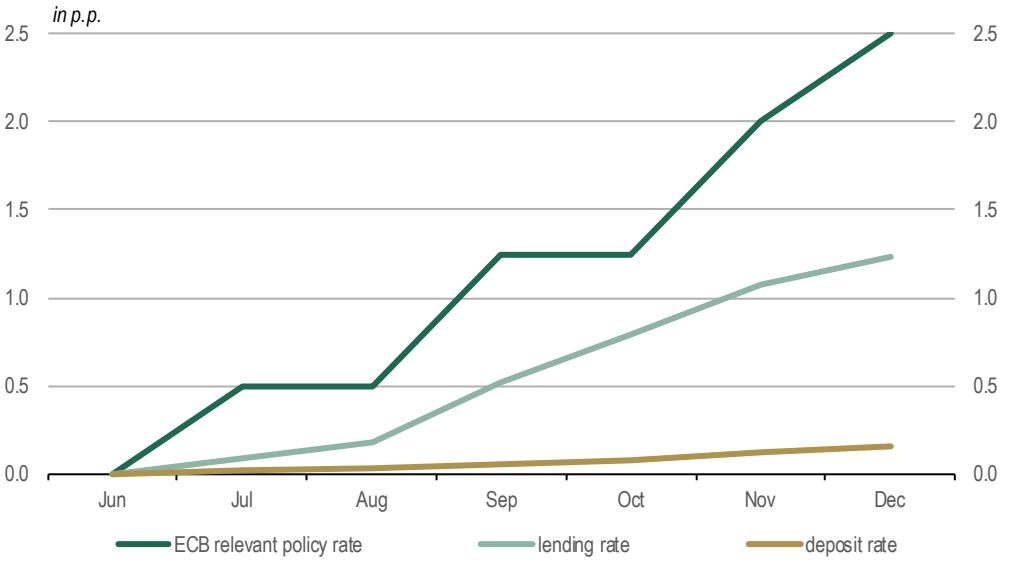


Note: The figure shows an increment in rates in percentage points from December 2005 on. ECB relevant policy rate is the MRO rate. All the series are normalised to zero one month before the initial rate hike.
Source: ECB, MIR, own calculations.

The abundance of deposits and liquidity in banks' books allows banks to keep deposit rates low.

Term deposit rates are also lagging behind the change in policy rate (Figure 1). Banks can afford this due to the current structure of their funding and assets. First, banks have an abundance of deposits, which resulted from a stable inflow of deposits over a longer period and especially during the pandemic. Whereas before the GFC banks made more than 1.4 euro of loans from every euro of deposits, the loan-to-deposit ratio started declining thereafter and in December 2022 stood at 90% (Figure 2). This declining trend happened despite targeted refinancing operations (TLTRO) that were designed to support lending, but a large part of TLTRO funds

Figure 4: **2022 tightening cycle**



Note: The figure shows an increment in rates in percentage points from July 2022 on. ECB relevant policy rate is the DFR rate. All the series are normalised to zero one month before the initial rate hike.
Source: ECB, MIR, own calculations.

ended in the deposit facility accounts with the ECB. This, together with asset purchase programmes, resulted in a large amount of liquidity on banks' books, which stood at EUR 4 trillion (11% of total assets) in December 2022. This implies that banks do not need to compete for deposits as they could simply channel excess liquidity to finance possibly more profitable investments.

3 Econometric analysis

Is the transmission to deposit rates lower in banks with larger amounts of deposits and liquidity?

To answer the above question, I compare the pass-through of policy rate to term deposit rates[6] in the last policy hike cycle with two previous ones in 2011[7] and 2008.[8] In particular, I estimate the following regression:

$$\begin{aligned} IRspread^{S}_{ict} = {} & \beta_1 \times d(Policy_c) + \beta_2 \times d(Policy_c) \times d(2022) \\ & + \beta_3 \times d(Policy_c) \times Deposit\ share_{ic} \\ & + \beta_4 \times d(Policy_c) \times Deposit\ share_{ic} \times d(2022) \\ & + \beta_5 \times d(Policy_c) \times Deposit\ share_{ic} \times I(Liquidity_{ic}) \\ & + \beta_6 \times d(Policy_c) \times Deposit\ share_{ic} \times I(Liquidity_{ic}) \times d(2022) + D_{ic} + \epsilon_{ict} \end{aligned} \quad (1)$$

Where *IRspread* is a spread between term deposit rate and 3-month Euribor, measured in bank *i*, policy cycle *c*, time *t* and sector *S={Households, NFC}*.The three policy cycles that are subject of the analysis are: 2008m3-2008m10, 2010m10-2011m9 and 2022m1-2022m12.[9] Dummy variable *d(Policy)* equals one when the policy rate was increasing within each cycle, i.e. in 2008m7-2008m10, 2011m4-2011m9 and 2022m7-2022m12 for the three cycles respectively. *d(2022)* denotes the last policy tightening cycle. *Deposit share* is expressed in total assets and measured one month before the initial rate hike in the cycle. *I(Liquidity)* is a dummy variable that equals one if bank-specific share of liquidity[10] (in total assets) is above the median, within each policy cycle. D_{ic} are bank-cycle fixed effects that absorb time-invariant bank characteristics within each cycle.

To estimate the above regressions, I use a matched dataset consisting of Individual Balance Sheet Items (IBSI) and Individual MFI Interest Rates (IMIR). The IBSI data contain granular information on the main balance sheet items, such as the amounts of loans, debt securities, deposits and wholesale funding, for around 3,000 euro area banks. The IMIR data contain bank-level information on lending rates and deposit

[6] Similar findings hold also for sight deposit rates. Results are available upon request.

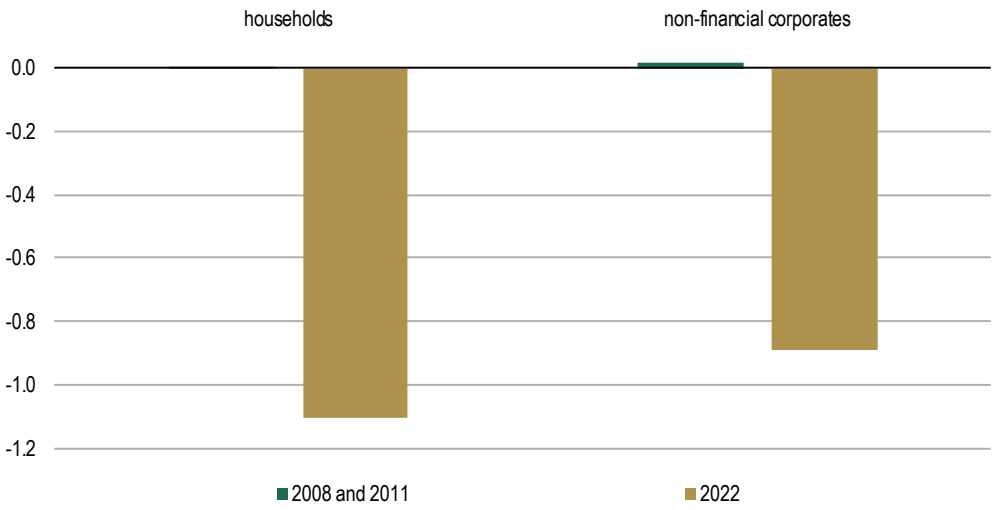
[7] In 2011, the ECB raised policy rates twice by 25 basis points.

[8] In July 2008, the ECB raised policy rates by 25 basis points. This was the last increase in the series of policy rate hikes that started in December 2005. Due to a lack of bank-level data prior to 2008, I can only estimate the response to the last increase in this cycle.

[9] Pooling together the data for the three policy cycles results in around 5600 bank-month observations for both households and non-financial corporates.

[10] Liquidity in the analysis is defined as bank's holdings at ECB accounts. Similar results are found when using a broader measure of liquidity that also includes short-term interbank loans, debt securities and equity investments. Results are available upon request.

Figure 5: **Deposit rate spread response to policy tightening**



Note: The figure shows model-based estimates of a change in term deposit rate spread (over Euribor 3m) after the change in policy (start of tightening). Result for 2008 and 2011 corresponds to β_1 from equation (1), whereas the one for 2022 is the sum of β_1 and β_2. This estimate excludes deposit share and interaction with liquidity, i.e. $\beta_3 - \beta_6$ are equal to zero. Impact in pp.
Source: IMIR, IBSI, own estimates.

rates for both new businesses and outstanding amounts. The IMIR database has a smaller coverage, which shrinks my dataset to about 250 banks. Despite that, the coverage in terms of euro area total assets is approximately 80% and the sample includes banks from all the euro area countries.

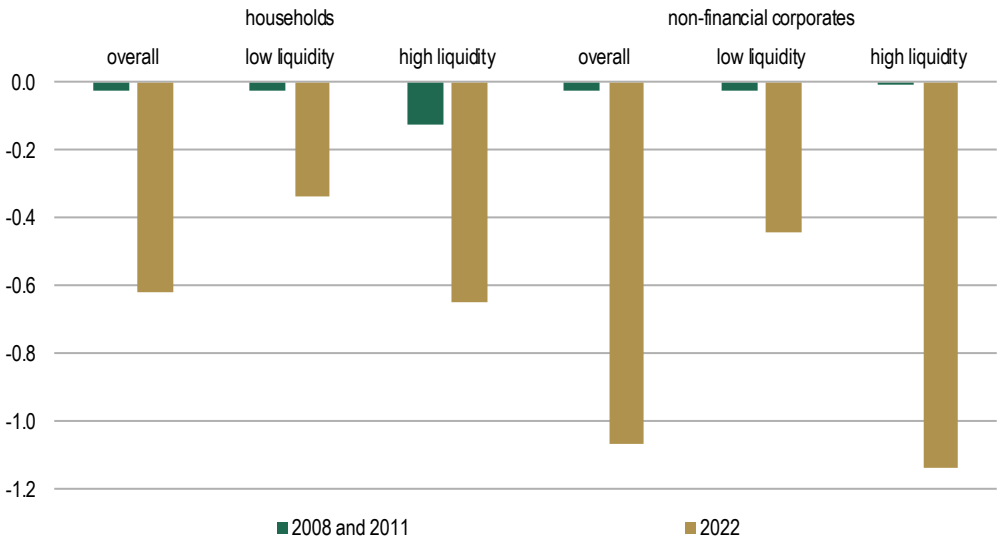
The response of term deposit rate to policy tightening is significantly lower in the current cycle compared to the previous two.

Whereas the spread between term deposit rate and Euribor remained more-or-less the same on average after rate hikes in 2008 and 2011, it decreased by 1.1 percentage point and 0.9 percentage point for households and non-financial corporates respectively after rate hikes in 2022 (Figure 5). This difference is highly statistically significant as well as economically important and shows that bank deposit rate policy is currently markedly different and that it attenuates the transmission of tighter monetary policy through banks.

Deposit rates increased by less in banks with a higher share of deposits.

The model-based estimates confirm a hypothesis of a lower response of deposit rates in banks that already have a large stock of deposits. More importantly, I find that this negative impact became stronger in the recent cycle (Figure 6). This implies not only that deposits are having a dampening impact on the transmission due to the current high amount, but also that the elasticity is larger in the current cycle. A median bank had a 37% share of deposits in 2011, which leads to about 1 basic point lower deposit rate spread after rate hike. In the current cycle, a median bank has 53% share of deposits, which results in 33 and 56 basic points lower deposit rate spread for households and NFCs respectively after rate hike in 2022. This shows that the high stock of

Figure 6: **Impact of a 1 percentage point increase in the share of deposits on deposit rate spread**



Note: The overall impact is β_3 (for 2008 and 2011) from equation (1) and $\beta_3 + \beta_4$ (for 2022), when interaction with liquidity is excluded ($\beta_5 - \beta_6$ are zero). Impact for low liquidity banks is: β_3 for 2008 and 2011 and $\beta_3 + \beta_4$ for 2022. Impact for high liquidity banks is: $\beta_3 + \beta_5$ for 2008 and 2011 and $\beta_3 + \beta_4 + \beta_5 + \beta_6$ for 2022.
Source: IMIR, IBSI, own estimates.

deposits on banks' books is currently an important driver of the sluggish response of deposit rates to policy rate hikes.

The response of deposit rates is low especially in banks that have a high share of deposits and at the same time hold an above-median share of liquidity.

In banks with an above-median share of liquidity in their total assets, the deposit rate spread decreases by 1.1 basic point for each percentage point increase in their share of deposits, while in banks with a lower-than-median share of liquidity, the spread to corporate deposits decreases only by 0.4 basic point (Figure 6). A similar relative relationship holds for households, whereas in previous cycles liquidity did not have an economically meaningful role for banks' deposit rate policy.

4 Policy implications and discussion

Low transmission of policy rate to deposit rates works against the tightening stance of monetary policy.

The results have important policy implications. Because euro area banks currently hold higher proportions of deposits and liquidity in their total assets, about 10 percentage points more than in previous cycles, the transmission to deposit rates has been notably lower. In addition, the responsiveness of deposit rates to the amounts of bank deposits and liquidity is also significantly higher (i.e. more negative) in the current tightening cycle, which further attenuates the transmission. Both these effects work against the tightening stance of monetary policy.

The results may warrant a faster pace of quantitative tightening in order to increase the transmission of policy rate to bank deposit rates.

The large amount of liquidity on banks' balance sheets resulted from a long-lasting period of accommodative monetary policy. It is expected that banks will repay the TLTROs with their holdings at deposit facility accounts, which will reduce the amount of liquidity by 1.4 EUR trillion by the end of 2024.[11] The remaining part of liquidity holdings (2.6 EUR trillion or 66% of the existing amount of central bank liquidity) stems from asset purchase programmes. According to the Governing Council decision on 15 December 2022,[12] the APP portfolio will decline at a rate of 15 EUR billion per month. The results of my analysis suggest that a faster pace of quantitative tightening in order to increase the transmission of policy rate to bank deposit rates is warranted.

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[11] A large part of it falls due in June 2023. Banks can also decide on an early repayment, the incidence of which increased after the October 2022 Governing Council meeting, where the interest rate on the funds borrowed in the third series of TLTRO was raised.

[12] Monetary policy decisions, 15 December 2022.