



Staff memo

The money market in Swedish kronor 2022-2023

A market overview and analysis of the pass-through from monetary policy

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Correction 22 August 2024:

The definitions of the concepts *repo* and *reverse repo* on page 26 have been corrected.

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Staff memos

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Introduction

The money market is key to the Riksbank's implementation of monetary policy. In this staff memo, we show that interest rates in this market were affected in the way that could be expected when the Riksbank raised the policy rate during the period 2022-2023. We also illustrate transaction patterns, activity levels and interest rate levels in the Swedish money market. Our focus is on the part of the money market where maturities are the shortest and where transactions largely arise because money market participants need to manage their short-term liquidity.

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The money market is the market for interest-bearing instruments that have a maturity of up to one year, and no coupon payments or other similar cash flows until maturity. The market fulfils a variety of functions for its participants. Among other things, it makes it possible to balance temporary liquidity imbalances between participants that need to place liquidity and those that need to borrow liquidity. The Riksbank indirectly sets the limits for this liquidity balancing by determining interest rates in its operational framework. This determines the opportunity costs of monetary policy counterparties for their liquidity management. In this way, the Riksbank stabilises the shortest market rates close to the policy rate. The money market is thus the first stage in the transmission of monetary policy and is therefore of key importance to the Riksbank.

For a few years now, the Riksbank has been collecting data on executed money market transactions from its monetary policy counterparties. We use this unique dataset, and other data sources as needed, to shed light on what transaction patterns and activity levels look like in the money market, and on how the interest rate formation works for the instruments that have the shortest maturities. Our focus in this staff memo is on the part of the money market that can be considered the market for liquidity balancing, that is maturities of up to about a week.

The staff memo is structured as follows. In Section 1 we provide an overview of what is meant by the money market and what functions it fulfils for its participants. We also explain what we mean by the market for liquidity balancing. The well-versed reader can probably scroll directly to Section 2, where we describe how the monetary policy conducted by the Riksbank over the 2022-2023 rate-hike cycle affected the money market. We show that money market rates generally changed to the same extent as the policy rate. For this reason, among others, the transmission from monetary policy

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to money market rates is judged to have been favourable over the period. The Riksbank's monetary policy also affected the money market in other ways, for example by reducing the banking system's excess liquidity in line with the reduction in the Riksbank's holdings of securities in Swedish kronor. In Section 3 we describe the trading patterns in the Swedish money market. For example, we highlight transaction activity and interest rate formation in the five main segments of the Swedish money market over the period 2022-2023. The segments we discuss are i) unsecured loans (or deposit contracts), ii) secured transactions in the form of repos, iii) FX swaps, iv) short-term debt instruments and v) OIS contracts, which are interest rate swaps where the underlying reference rate has a very short maturity. This part of the memo can be used as a reference work. In Section 3, we also explain how the instruments work and are used.

In an appendix, we show how the money market is affected by year-end effects. There are also a number of fact boxes in the staff memo that highlight important phenomena and provide more information. There are boxes on how the Riksbank's operational framework functions and on how the banking systems liquidity position is determined, on how reference rates are linked to the money market and on the market-supporting repo facilities provided by the Swedish National Debt Office (SNDO). At the end of the main text of the staff memo, there is also a box with more information about the data sources on which the memo is based.

1 The money market in Swedish kronor

The money market is the part of the fixed-income market where instruments have the shortest maturity. It fulfils a variety of functions for its participants. Among other things, it provides an opportunity to balance out temporary liquidity imbalances. The money market is also the first step in the transmission of monetary policy.

The money market is the part of the fixed-income market where interest-bearing debt instruments with the shortest maturities are traded.² This is usually considered to be those instruments whose original maturity is shorter than one year. Another definition, which often coincides with the previous one, is that money market instruments do not have any coupon payments or other cash flows before maturing. Instead, the yield is regulated by the difference between the cash flows when the instruments are traded and when they mature, or as a net payment at maturity. It is also this definition of the money market that we use in this staff memo. This is in line with the definition used in the European Central Bank's regular report on the euro money market (ECB, 2023).

The most important players in the money market in Swedish kronor are banks, the SNDO and various financial companies such as asset managers, pension and insurance firms. Large non-financial companies also use the money market to a significant extent.

In practice, the five major banks have a special position on the money market in Swedish kronor.³ This is because they are the largest players in the market and also act as counterparties or intermediaries in many of the transactions executed. They therefore play a key role in interest rate formation and thus in the pass-through of the Riksbank's monetary policy to the money market. All of them are also under contract with the SNDO to be primary dealers for Swedish government bonds in addition to being monetary policy counterparties to the Riksbank.

The money market fulfils a number of different functions for its participants.

- It enables **short-term liquidity balancing** between participants needing to borrow and those needing to place liquidity. This can be done, for example, by means of unsecured loans with a very short maturity. These are also called deposit contracts.
- It gives participants needing to **borrow a specific debt security** an opportunity to do so. In a repo transaction the participants swap cash against

² It is worth noting that the term money market is sometimes used differently. In the classic Swedish textbook *Penningmarknaden [The Money Market]* (Nyberg, Viotti and Wissén, 2014), for example, it is used synonymously with the fixed-income market, which also includes interest-bearing instruments with longer maturities such as bonds and many types of interest rate derivatives.

³ By the five major banks, we mean Danske Bank, Svenska Handelsbanken, Nordea, Skandinaviska Enskilda Banken and Swedbank.

a securities for a short period. Repos can therefore also be used for liquidity balancing.

- It allow participants to **manage liquidity imbalances between currencies**. In an FX-swap, participants swap cash in different currencies for a certain period. A liquidity deficit in one currency can be temporarily be solved by converting a surplus in another currency.
- It is a source of **short-term funding**, for example in the repo market for very short maturities of around week or through the issuance of short-term debt securities for slightly longer but still short maturities. The latter is used, for example, by the state, which issues so-called treasury bills, or non-financial companies, which often issue what is known as commercial paper.⁴
- It offers a possibility to both **speculate** in the future interest rates and to manage **interest rate risk**. One way of doing this is to use so-called OIS contracts, i.e. interest rate swaps with an underlying reference rate with a very short maturity.

The largest transaction volumes in the Swedish money market occur at maturities of up to just over a week. In these cases, the shortest part of the money market can also be referred to as the market for liquidity balancing, see Section 1.1 below. Short-term securities and OIS contracts, however, usually have longer maturities than this.

1.1 The market for liquidity balancing

Current cash flows arise in both financial and non-financial activities, but there is rarely a perfect match between inflows and outflows. This gives rise to liquidity imbalances that need to be managed. Larger players mainly manage their liquidity in the money markets.⁵ Liquidity imbalances are typically managed with instruments that have a maturity of up to around a week, and they are mainly managed using overnight loans, repos or FX swaps. The shortest part of the money market can then also be referred to as the market for liquidity balancing. Typical players in this market are the Riksbank's monetary policy counterparties, especially the largest banks.⁶ However, other players also frequently use the market to manage their short-term liquidity needs.

The money market, and especially the part which we call the market for liquidity balancing, is the first step in the transmission of monetary policy to the real economy. Money market rates then propagate through the financial system and ultimately

⁴ The Riksbank also uses this type of instrument in the operational framework, see fact box on page 8. These securities are then referred to as Riksbank Certificates.

⁵ In the case were actors with a need to actively manage their short-term liquidity are not active in the money market, they usually manage their liquidity with their bank.

⁶ By monetary policy counterparties we mean those entities that that can obtain credit from the Riksbank and can place funds in the Riksbank, see the fact box on page 8 and Hansson and Wallin Johansson (2023). See, for example, Kronstedt Metz (2005) for an overview of how these manage their liquidity. This article continues to provide a good overview of how banks manage their liquidity and how interest rate formation interacts with the Riksbank's operational framework for monetary policy. This is despite the fact that the article is quite old, and that some conditions have changed.

affect the interest rates faced by households and businesses, which in turn affect inflation and real economic developments.

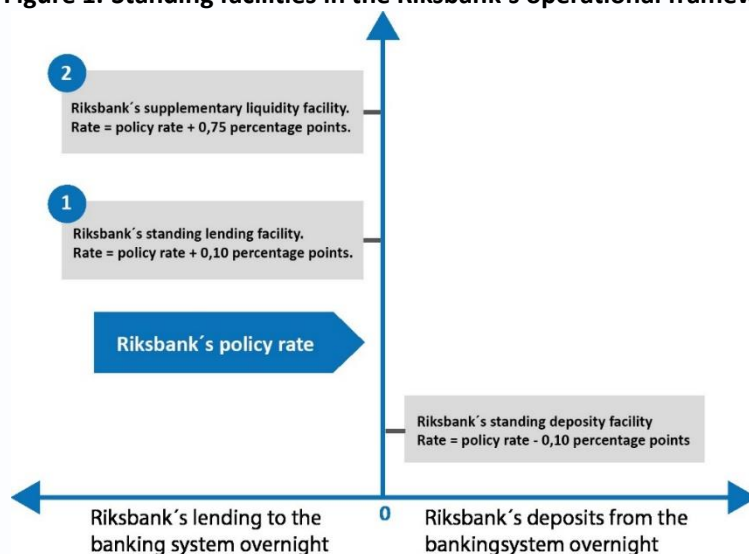
In order to affect the interest rate formation in the market for liquidity balancing the Riksbank controls the counterparties' opportunity costs for their liquidity management. The Riksbank does this by setting the interest rates on the various instruments offered to monetary policy counterparties within the operational framework. The interest rates on transactions between the Riksbank and its monetary policy counterparties affect the interest rates that the counterparties set on transactions between themselves and on transactions with other participants. In this way, the Riksbank can use the monetary policy operational framework to stabilise interest rate levels in the money market close to the policy rate, which in turn affects longer market rates and the interest rates faced by households and companies.

FACT BOX – The Riksbank’s operational framework⁷

The Riksbank uses its operational framework to stabilise the shortest market rates sufficiently close to the policy rate. In practice, this is done by the Riksbank making, or offering to make, financial transactions with a limited group of financial agents. These so-called monetary policy counterparties are given the opportunity to place liquid funds in or borrow liquid funds from the Riksbank. The Riksbank can therefore control their opportunity cost of short-term liquidity balancing. This stabilises money market rates close to the policy rate.

The deposit facility allows counterparties to place an unlimited amount of liquidity overnight at an interest rate 0.1 percentage point below the policy rate. In the lending facility, they can borrow unlimited amounts of liquidity overnight at an interest rate 0.1 percentage point above the policy rate in exchange for high-quality collateral such as government bonds. These two facilities form a 0.2 percentage point wide corridor around the policy rate. In addition, counterparties can borrow against slightly inferior, but still adequate, collateral, such as covered bonds, at an interest rate 0.75 percentage points above the policy rate in the supplementary liquidity facility.

Figure 1. Standing facilities in the Riksbank’s operational framework



Note. The filled circles with numbers refer to the collateral pools required to use the respective lending facility: primary (1) and secondary (2) collateral pool.

Source: Hansson and Wallin Johansson (2023)

The Riksbank also conducts weekly market operations to drain excess liquidity from the banking system by issuing discount securities (Riksbank Certificates) at an interest rate equivalent to the policy rate. Draining central bank reserves from the banking system helps to stabilise interest rates between monetary policy counterparties in the middle of the interest rate corridor of the operational framework.

⁷ For more information about the operational framework, see Hansson and Wallin Johansson (2023).

FACT BOX - The banking system's liquidity position

An important link between the Riksbank's operational framework and the money market is the banking system's so-called liquidity position towards the Riksbank. The liquidity position is the total claim that the banking system has on the Riksbank in Swedish kronor. It is thus a deposit in the Riksbank that is directly available for the respective monetary policy counterparty to use for liquidity management. These claims are also known as central bank reserves and together with banknotes and coins, they constitute the monetary base ("central bank money"). The banking system's liquidity position towards the Riksbank is found on the liability side of the Riksbank's balance sheet and is also known as the Riksbank's monetary policy debt. It is the liquidity position that determines the volume of central bank reserves available for the overnight liquidity balancing of the monetary policy counterparties. Since year 2008, the Swedish banking system has had a liquidity surplus towards the Riksbank.

If something happens on the asset side of the Riksbank's balance sheet that reduces the total assets, this must also be reflected on the liability side of the balance sheet. This happens by affecting the liquidity position of the banking system. An example of such a factor that affects this is therefore how the Riksbank's securities holdings in Swedish kronor develop. When the Riksbank purchased securities for monetary policy purposes during the period 2015-2022, the banking system's claim on the Riksbank increased, as the securities were paid for with central bank reserves. When the Riksbank's securities holdings decrease through maturities and active sales, the banking system's claim on the Riksbank decreases instead. The liquidity position can also be affected by measures that only affect the liability side of the Riksbank's balance sheet. One such factor is the development of the amount of currency in circulation. If the value of banknotes and coins in circulation decreases, the liquidity position increases and vice versa. It is worth noting that measures not taken for monetary policy purposes can also affect the banking system's liquidity position towards the Riksbank, despite use of the term "monetary policy debt".

The liquidity position is also affected when the Riksbank issues Riksbank Certificates or when one of the monetary policy counterparties borrows liquidity in the standing facilities. However, this impact is temporary. In the first case, the amount of outstanding central bank reserves decreases because the Riksbank withdraws ("drains") central bank reserves from the banking system through the issues. In the latter case, central bank reserves are injected into the banking system.

2 The pass-through of monetary policy to the money market 2022-2023

Over the period April 2022 to September 2023, the policy rate was raised by a total of 4.0 percentage points. The Riksbank also took a number of additional measures that affected the amount of liquidity available in the market for liquidity balancing. The pass-through to interest rate formation in the money market was as expected, implying that money market rates changed to approximately the same extent as the policy rate and that their level was close to that of the policy rate.

2.1 Monetary policy and the operational framework 2022-2023

The level of activity and interest rate formation in the money market are affected by the level of the Riksbank's policy rate. They are also affected by how the operational framework is designed and applied, by how the Riksbank's securities holdings in Swedish kronor are managed and by other measures that affect the Riksbank's balance sheet. This is because balance sheet measures affect the amount of central bank reserves that are structurally available in the market for liquidity balancing.

Over the period 2022-2023, there were significant changes in the monetary policy conducted by the Riksbank compared with the previous years, see Table 1 below. The policy rate was raised from 0.00 to 4.00 per cent at a total of eight monetary policy meetings. The rate hikes were implemented in steps ranging from 0.25 to 1.00 percentage points.

Table 1. Changes in the Riksbank's policy rate 2022-2023

Percentage points and per cent respectively

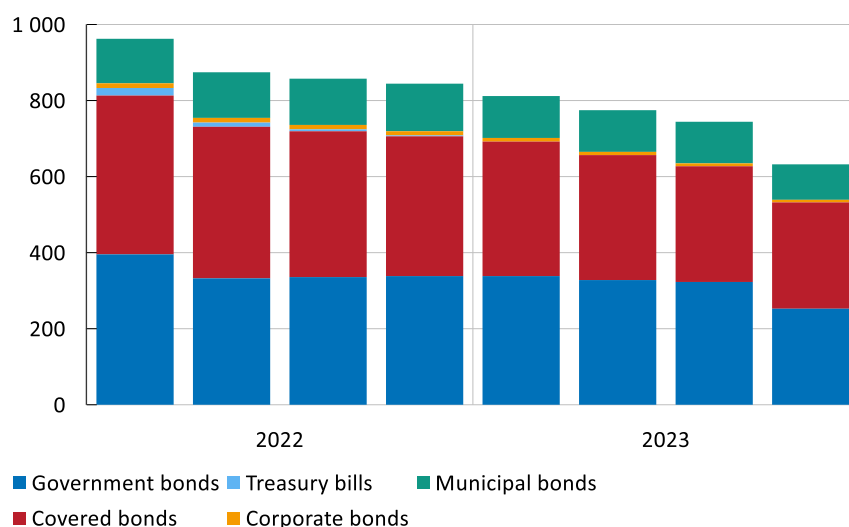
Date of decision	Implementation date	Change	Policy rate after hike
27 Apr 2022	4 May 2022	+0.25	0.25
29 June 2022	6 July 2022	+0.50	0.75
19 September 2022	21 September 2022	+1.00	1.75
23 November 2022	30 November 2022	+0.75	2.50
8 February 2023	15 February 2023	+0.50	3.00
25 Apr 2023	3 May 2023	+0.50	3.50
28 June 2023	5 July 2023	+0.25	3.75
20 September 2023	27 September 2023	+0.25	4.00

Source: The Riksbank

As a result of previous monetary policy measures, the Riksbank has significant holdings of debt securities in Swedish kronor. During the year 2022, the Riksbank conducted purchases of securities that partly compensated for holdings that matured during the year. These purchases were fully terminated at the turn of the year 2022–2023. In February 2023, the Riksbank decided to offer to sell Swedish government bonds from its holdings from April of that year onwards. Later in the year, monthly sales volumes were also increased. The Riksbank’s holdings of securities also decreased as a result of bond maturities, see Chart 1 below.

Chart 1. The Riksbank’s security holdings in Swedish kronor

SEK billion



Source: The Riksbank

The normalisation of the Riksbank’s balance sheet and the reduction of the Riksbank’s securities holdings in Swedish kronor contributed during the period 2022-2023 to the banking system’s liquidity surplus against the Riksbank was reduced notably. Even measures not taken for monetary policy purposes affected the liquidity position. One such measure over the period was the transition to a fully self-financed foreign exchange reserve, which was finalised in 2022.⁸ At the end of 2023, the banking system’s liquidity position against the Riksbank was SEK 987 billion before the issuance of Riksbank Certificates, which can be compared with a peak of just over SEK 1,200 billion in May 2022, see Chart 2 below.

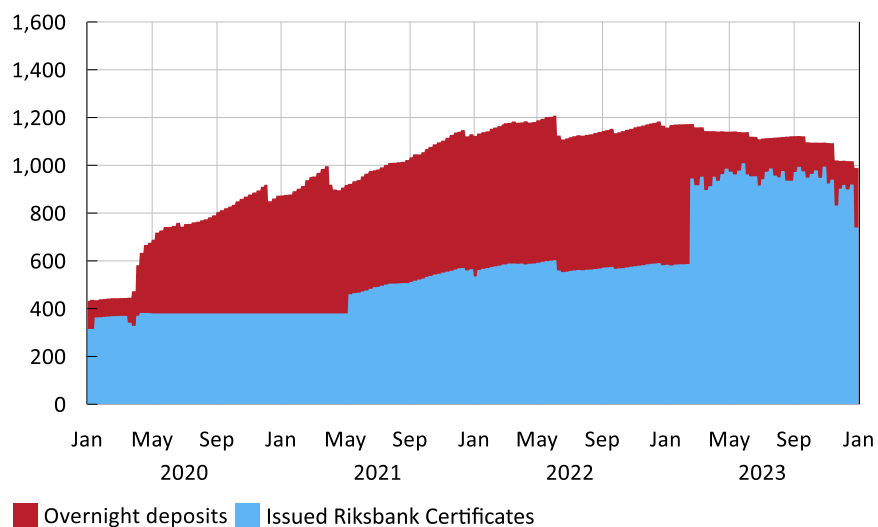
During the period 2022-2023, the Riksbank also made a number of changes to its operational framework for monetary policy. In June 2022, the final steps of the reforms implemented in stages over the period 2019-2022 were implemented. This mainly entailed the Riksbank introducing the two separate lending facilities, each with a pool of eligible collateral.⁹ Previously, the Riksbank had lent against both collateral

⁸ The transition to a self-financed foreign exchange reserve increased the liquidity position as loans from the SNDO were replaced by monetary policy debt.

⁹ In addition to what is mentioned in the main text, an important change that took effect in June 2022 was that the name of the Riksbank’s main policy rate was changed from the “repo rate” to the “policy rate”. In

pools at the same interest rate, i.e. with a mark-up of 0.1 percentage point on the policy rate.¹⁰ The change therefore made it slightly more expensive for monetary policy counterparties to borrow against the types of collateral that are now included in the secondary collateral pool, which includes covered bonds.

Chart 2. Distribution of banking system’s liquidity surplus against Riksbank
SEK billion



Source: The Riksbank

Another change during the period concerned how the Riksbank applies the operational framework for monetary policy. In 2022 and early 2023, a principle was applied that only an amount equal to half of the banking system’s excess liquidity would be offered in the issues of Riksbank Certificates. This implied that at most half of the liquidity was drained with the help of Riksbank Certificates, while the other half always remained for overnight liquidity balancing. In February 2023, the Riksbank decided to remove this limitation on the volume offered in the issuance of Riksbank certificates. From mid-February 2023, the entire liquidity surplus has been offered, but monetary policy counterparties usually choose to leave a significant amount of central bank reserves available overnight, on average just under SEK 150 billion (see Chart 2). Compared to before February 2023, there is however a lot less liquidity remaining overnight.

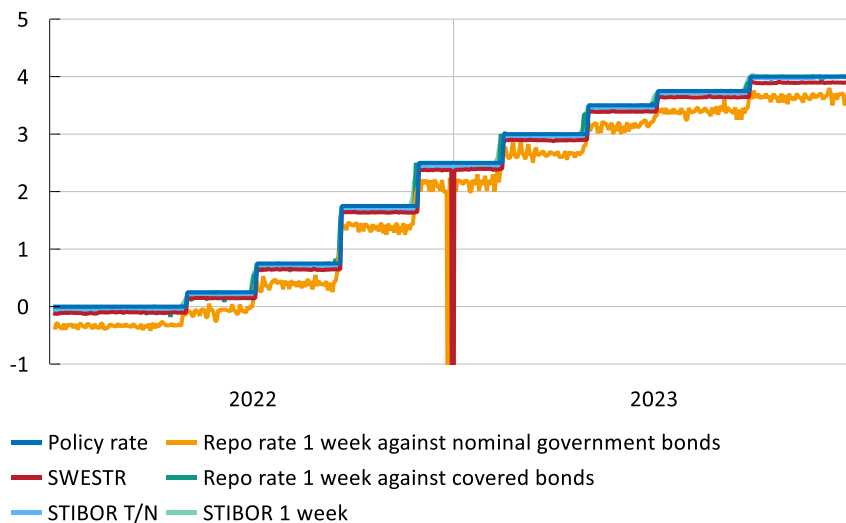
this staff memo, we use the term "policy rate" also for the period before the formal name change and reserve the term "repo rate" for interest rates on transactions in the private repo market. For more information on the 2019-2022 reforms, see Hansson and Wallin Johansson (2023).

¹⁰ In addition to what is mentioned in the main text, the Riksbank applied a number of conditions on collateral before the introduction of the two collateral pools. There were e.g. limitations on how much of the total collateral pool could consist of covered bonds.

2.2 Impact on the money market 2022-2023

The Riksbank's monetary policy during the period 2022-2023 has affected the money market in several ways. The changes in the level of the policy rate have had the clearest effect on money market rates, but the winding-down of the Riksbank's securities holdings and the changes in the operational framework have also affected both interest rates and the level of activity.

Chart 3. The policy rate and money market rates 2022– 2023



Note. The repo rates are volume-weighted and have been calculated based on the transaction data collected from the monetary policy counterparties. Transactions with the SNDO have been excluded from the calculation of repo rates.

Source: Riksbank, SFBF

The policy rate increases quickly had the expected effect on the shortest money market rates once they came into effect, see Chart 3 and Chart 4.¹¹ The charts also show that these money market rates during the period 2022-2023 generally were close to the level of the policy rate, with the exception of repo rates against government bonds which were generally about 0.3 to 0.4 percentage points below the policy rate. Beyond monetary policy, these repo rates are to a large extent affected by the pricing of the SNDO's market-supporting facilities. Policy rate changes were propagated to all these rates with a high degree of correlation, which also applied for rates on repo against government bonds. There has also been limited volatility in these money market rates, as shown in the charts. One exception was the well-documented year-end effect, see Appendix.

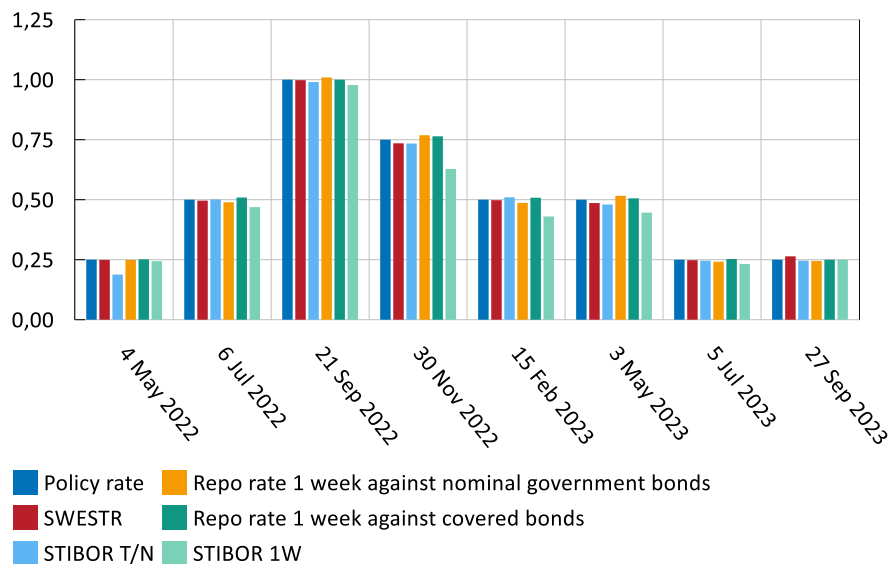
From these observations, the conclusion can be drawn that the transmission of the policy rate level to short money market rates was favourable over the period 2022-2023. Another conclusion that can be drawn is that the Riksbank's operational

¹¹ It is the effective policy rate that matters. Announced interest rate changes that have not taken effect only matter to the extent that the maturity of the instruments extends beyond the implementation date.

framework has achieved its main objective during the period, that is, to stabilise short market rates close to the policy rate.

Chart 4. Instantaneous pass-through of interest rate hikes in 2022-2023

Change in the interest rate level in percentage points



Note. The repo rates are volume-weighted and have been calculated based on the transaction data collected from the monetary policy counterparties. Transactions with the SNDO have been excluded from the calculation of repo rates. The policy rate, SWESTR and STIBOR T/N show change compared with the day before the policy rate hike. Repo rates and STIBOR 1 week show how much the rates were changed in comparison with the week before. The effective dates of the rate increases are shown on the x-axis.

Source: Riksbank, SFBF

Over the period 2022-2023 there have consistently been ample central bank reserves left in the liquidity balancing market overnight, which has pushed down the rates on unsecured transactions (loans and deposits) with very short maturities towards the Riksbank's deposit rate, see Chart 5.¹² Nor is it possible to see any clear effect on SWESTR since the Riksbank began offering the entire liquidity surplus in the issues of Riksbank Certificates in February 2023. On the other hand, STIBOR T/N has tended to be fixed marginally higher against the policy rate since then, but even this shift has been of modest size and has taken place in an orderly manner.¹³ Also because of the substantial liquidity surplus, monetary policy counterparties have had very little need to borrow from the Riksbank. Therefore, when the operational framework was changed in June 2022 and the two lending facilities were introduced, money market rates were barely affected.

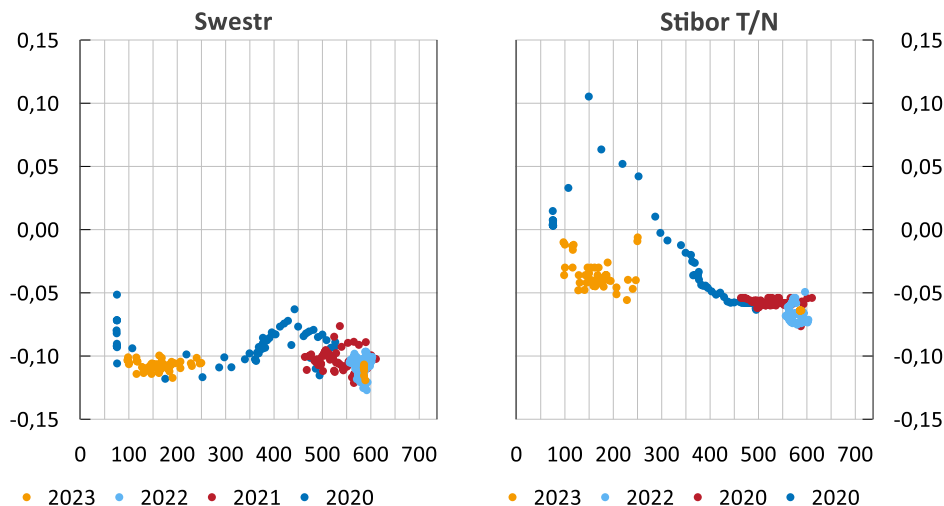
¹² The deposit rate is the policy rate less 0.1 percentage point.

¹³ The occasions in 2020 when the differential between STIBOR T/N and the policy rate exceeds +0.02 percentage points all occur during the period of stress in funding markets in connection with the outbreak of the coronavirus pandemic. For more information on the turbulence on financial markets during the spring of 2020, see for instance Gustafsson and von Brömsen (2021).

Chart 5. Overnight deposits and deviation of reference rates from the policy rate

X axis: Differential against the policy rate in percentage points

Y axis: Deposits in the Riksbank's deposit facility in SEK billion



Note: Average per week starting on Wednesdays. This is to correspond to the periods over which the Riksbank certificates mature. Differential against the policy rate calculated as the reference rate minus the policy rate. SWESTR became available for actual use as a reference rate on 1 September 2021. For the period before that, the historical estimates published by the Riksbank for SWESTR have been used. Occasional deviating observations, mainly at the turn of the year, are not shown in the chart.

Source: The Riksbank

Government bonds and covered bonds are the dominant types of collateral in the Swedish repo market, see Section 3.2. Unlike some other central banks, the Riksbank has not repoed out its bond holdings in Swedish kronor, which has meant that this collateral has not been available in the repo market. Over the period 2022-2023, the Riksbank reduced its holdings of government bonds, covered bonds and other securities in Swedish kronor, which contributed positively to the amount of collateral available in the repo market.¹⁴

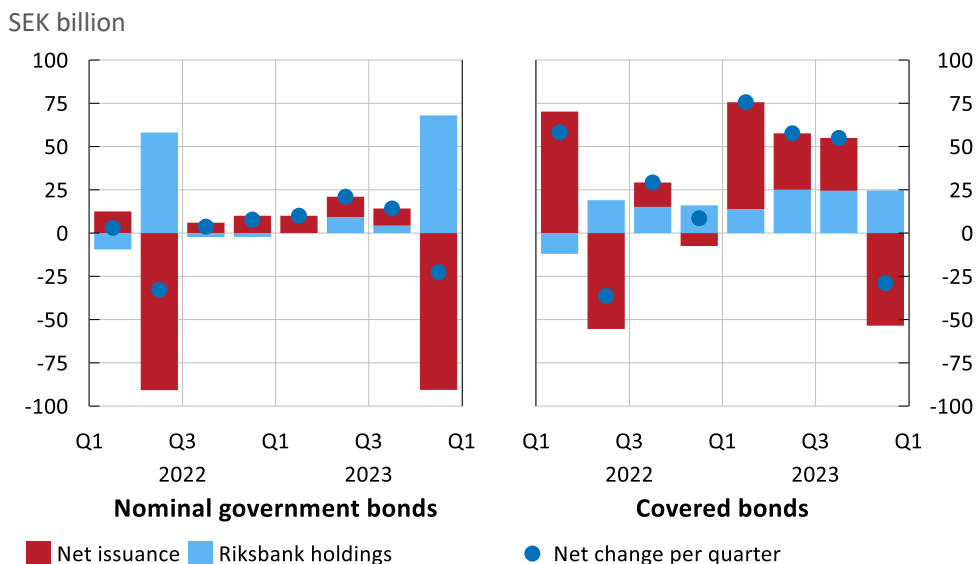
At the end of the period, the SNDO also increased the gross issuance volumes of government bonds. All in all, the measures taken by the two authorities thus meant that the availability of government bonds, for example in the repo market, has increased towards the end of the period at the same time that the Riksbank's holdings have been reduced by bonds maturing, see Chart 6. In addition, net issuance volumes of covered bonds have increased.

When the Riksbank's holdings of a certain government bond issue matures, this does not in itself imply the amount of available collateral increases. What it does do, however, is to reduce the effect on the amount of available collateral from the total outstanding volume of the issue maturing. Ponder for instance that the outstanding volume of a certain government bond issue is just over SEK 100 billion and that the

¹⁴ Note that we make an implicit assumption that all outstanding bonds not held by the Riksbank are available to the repo market. This is a simplification, however.

Riksbank at maturity has a holding in this issue of just over SEK 50 billion. This means that the amount of available collateral only decreases by about SEK billion, as the Riksbank has already withdrawn this amount of securities what the bonds were originally purchased.¹⁵

Chart 6. Change in the amount of collateral available in the repo market



Note. Refers to the quarterly change in the outstanding volume of nominal government bonds in Swedish kronor and the outstanding volume of covered bonds in Swedish kronor from issuers with dealer agreements, as well as the change in the Riksbank's holdings of the same types of bonds with a reversed sign.

Source: The Riksbank

Apart from the effect of two large government bond maturities during the period, the availability of collateral in the form of government bonds has steadily increased over the period 2022-2023.¹⁶ In line with this, the utilisation of the SNDO's market-supporting repo facilities has declined after being very high at the beginning of the period, see Chart 20 on page 32.¹⁷ Market participants also state in the Riksbank's Financial Market Survey that the government bond market is functioning better (Sveriges Riksbank, 2024b). However, this does not seem to have had any notable impact on repo rates against government bonds, which also towards the end of the period 2022-2023 traded at interest rates about 0.3 to 0.4 percentage points below

¹⁵ This illustrative example builds on the approximate numbers for government bond 1057, which matured in November 2023.

¹⁶ Of particular note here are the maturities of government bonds 1054 (1 June 2022) and 1057 (13 November 2023). The total outstanding volume of these at maturity was 108 billion and 103 billion respectively. After taking into account the Riksbank's holdings, the effect was that around SEK 41 billion and SEK 50 billion respectively of available government bonds in the repo market were withdrawn at each maturity.

¹⁷ Based on the fact that the SNDO provides the market-support repo facilities, one could argue that the supply of government bonds is infinite in Sweden, and that the reduction in the Riksbank's holding thus should not affect the repo market against government bonds. That the usage of the repo facilities now has fallen noticeably as the availability of collateral from other sources has increased rather indicates that the market participants do not consider the supply of government bonds to be infinite. For more information on the SNDO market-supporting facilities, see the fact box on page 31.

the policy rate. As before, the pricing of repos in the private repo market was clearly influenced by the pricing of the SNDO's facilities at the end of the period, see Chart 3 above and Chart 19 on page 31.

3 The various money market segments 2022-2023

In this section, we present the most important instruments in the money market in Swedish kronor and describe each segment of the money market over the period 2022-2023.¹⁸ The instruments covered are overnight loans, repos, FX swaps, short-term debt securities and OIS contracts.

In this analysis, we have been very much inspired by the European Central Bank's *Euro money market study* (ECB, 2023). We therefore use the same definition of the money market as in this study, see section 1. In line with this, we address five types of money market instruments: unsecured transactions (unsecured loans or deposits), secured transactions (repos), FX swaps, short-term debt instruments and so-called OIS contracts.¹⁹ These instruments and the characteristics of each market are presented in the paragraphs below.

ECB (2023) relies heavily on the data collected by the ECB on the euro money market, known as MMSR data.²⁰ Our analysis is also mainly based on the corresponding transaction data that the Riksbank collects on the money market in Swedish kronor (TORA data), see the fact box at the end of the staff memo. These data are reported by the Riksbank's monetary policy counterparties that represent the largest share of activity in the Swedish kronor money market.²¹ These data contain transaction-level information on transactions in the three segments of unsecured deposits, repos and FX swaps. Information is available for transactions with a maturity of up to 10 days. Unless otherwise stated, our conclusions in this section are based on these data.

Unlike the data collected by the Riksbank, the ECB's MMSR data contain additional segments in the form of short-term debt securities and OIS contracts. In addition, the MMSR data contain information on transactions with maturities of up to just over one year in all five segments. Compared with the ECB (2023), we have therefore had to supplement the collected transaction data to a greater extent with other data sources, see the fact box at the end of the staff memo.

¹⁸ In the authors' judgement, the money market characteristics that applied in the period 2022-2023, and which are described in this section, broadly prevail thereafter. Therefore, the present tense verb form is used throughout this section.

¹⁹ Among the instruments that could have been mentioned, but were not, are a number of types of short-term interest rate derivatives such as FRAs and RIBAs. FRAs, or *forward rate agreements*, are forward contracts at STIBOR 3m on certain predefined dates, while RIBAs (*Riksbank futures*) are forward contracts at the average policy rate over predefined periods.

²⁰ The scope of the data collected by the ECB is defined in Regulation (EU) No 1333/2014 of the European Central Bank of 26 November 2014 on money market statistics (ECB/2014/48), commonly referred to as the MMSR Regulation. The acronym MMSR stands for Money Market Statistical Reporting.

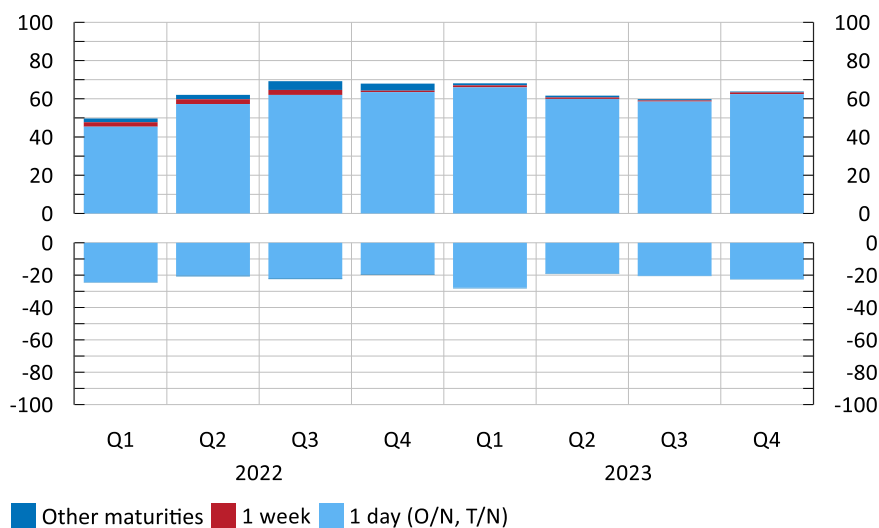
²¹ All reporters are credit institutions. Transactions with the Riksbank are not to be reported.

3.1 Unsecured transactions (deposits)

In the Swedish money market, unsecured transactions are usually conducted as unsecured loans (Swe. *dagslån*). In Swedish, the term deposit or deposit contract is also used in line with the English terms.²² These transactions have a simple and standardised construction. It involves one party to the transaction lending cash to the other party without receiving collateral for the loan. In the Swedish market, transactions always have a specified maturity and an agreed interest rate. However, this simple structure, where no collateral is provided for the loan, means that these transactions involve a counterparty risk for the depositor, which affects the interest rate of the transactions.

Chart 7. Volume traded in the deposit market

Average daily volume, SEK billion



Note. The upper panel shows when reporters borrow cash. The lower panel when they lend cash. Both panels refer to maturities up to 10 days.

Source: The Riksbank (TORA)

Deposits are mainly used to balance liquidity needs between different participants at very short maturities, see Chart 7. Most commonly, unsecured transactions are conducted with an underlying maturity of one day. The most common is the *overnight* (O/N) maturity. However, there is also some activity at other maturities, such as from the business day after the trade day to the next day (*tomorrow-next* (T/N)) or one week.²³ Over the period 2022-2023, turnover in the deposit market remained relatively unchanged, although an increase can be observed over 2022, see Chart 7.

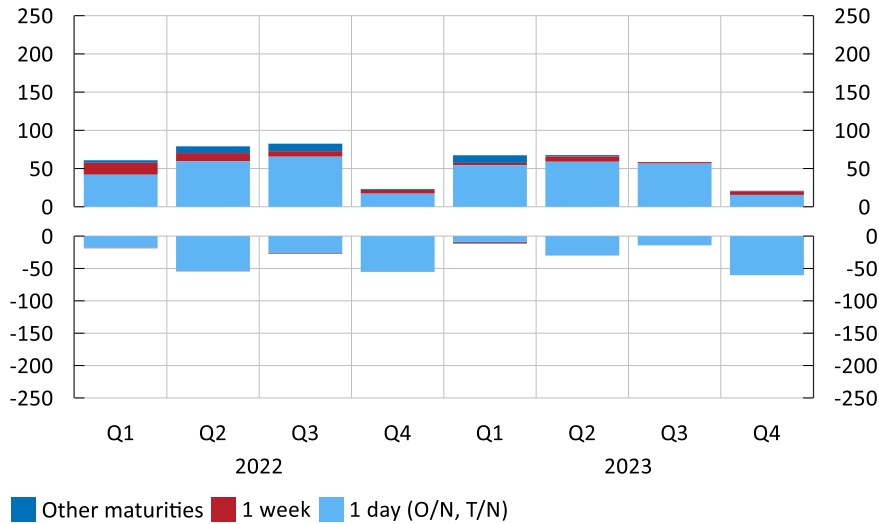
²² One reason for this may be that the term *dagslån* (literally translation is “day loan”) may incorrectly suggest intraday credit, which is offered within the framework of the Riksbank’s central payment system RIX. Another reason for this may be that it appears wrong to use this name for transactions with a longer maturity than one day.

²³ Historically, the T/N maturity was the dominant one for liquidity management in Sweden (see Kronstedt Metz, 2005), which is one reason why the shortest maturity for the STIBOR reference rate is still T/N and not O/N.

The outstanding volumes at quarter-end have also seen a similar development with the exception of the fourth quarter of each calendar year, as shown in Chart 8.

Chart 8. Volume outstanding in the deposit market at the end of the quarter

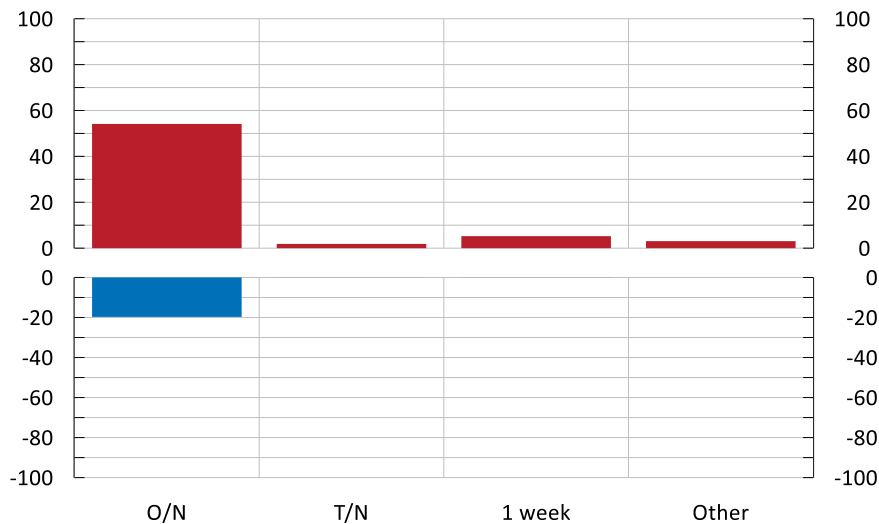
SEK billion



Note. Refers to contracts that have been settled but have not yet matured on the day in question. The upper panel shows when reporters borrow cash. The lower panel when they lend cash. Both panels refer to maturities up to 10 days.
Source: The Riksbank (TORA)

Chart 9. Volume outstanding in the deposit market on 31 August 2023

SEK billion

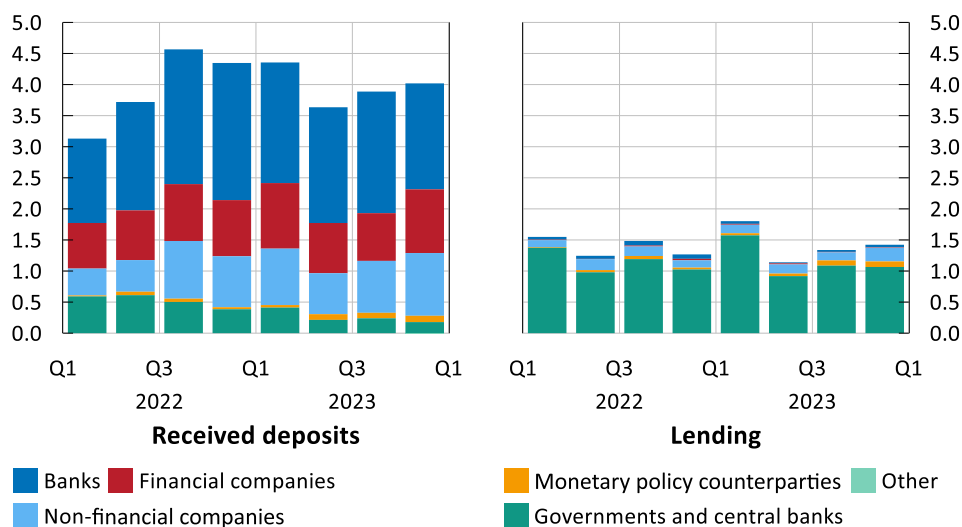


Note. Refers to contracts that have been settled but have not yet matured on the day in question. The upper panel refers to when reporters borrow cash. The lower panel when they lend cash. Both panels refer to maturities up to 10 days. 31 August 2023 is intended to represent an ordinary day, unaffected by any effects around interest rate announcements or reconciliation dates, such as year-end or quarter-end.

Source: The Riksbank (TORA)

Chart 10. Reporters' counterparties in the deposits market

SEK billion



Note. Refers to total volume traded during the quarter in question. Refers to maturities up to 10 days. The category “banks” should be interpreted as banks that are not also monetary policy counterparties. “Financial companies” should be interpreted as financial companies that are not also banks.

Source: The Riksbank (TORA)

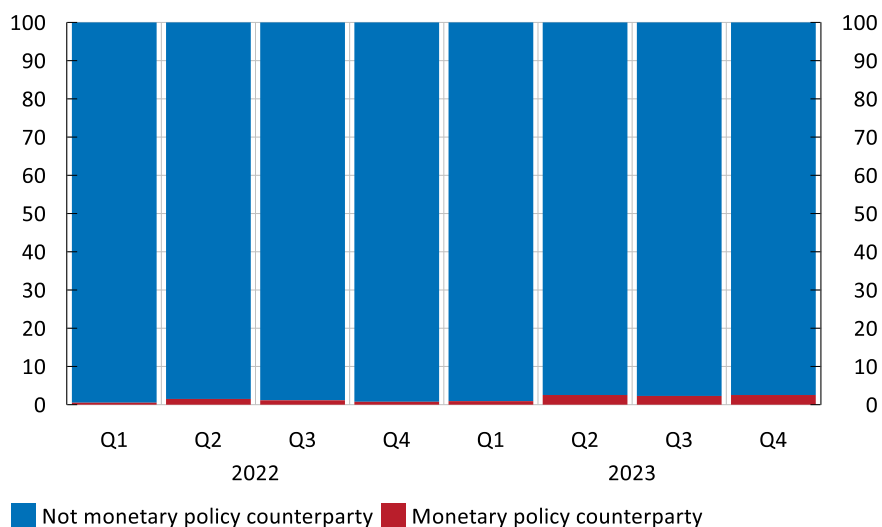
It is common for the reporters' counterparties in this type of transaction to be banks that are not monetary policy counterparties, but there is nevertheless a dispersion between the different types of participants, see Chart 10. In addition to banks that are not monetary policy counterparties, these include both financial and non-financial companies. There are also participants classified as state actors, such as the SNDO, entities in the social security system or equivalent foreign entities.

However, it is clear that the Riksbank's reporters receive by far the most deposits from their clients that do not have access to the Riksbank's deposit facility, see Chart 11. The fact that monetary policy counterparties do not trade much with each other is not surprising given the banking system's significant liquidity surplus against the Riksbank. This has reduced the need for monetary policy counterparties to balance liquidity with each other. In addition, the Riksbank's earlier purchases of bonds have contributed to the banking system in turn having substantial deposits from, for example, financial companies.²⁴ Bank customers also tend to get more attractive deposit rates if they make deposits in the money market than if they leave deposits in regular bank accounts, making placements in the overnight market attractive.

²⁴ For more information, see Andersson and Kaplan (2024).

Chart 11. Reporters' received deposits

Percentage share



Note. Refers to volume traded during the quarter in question. Refers to maturities up to 10 days.

Source: The Riksbank (TORA)

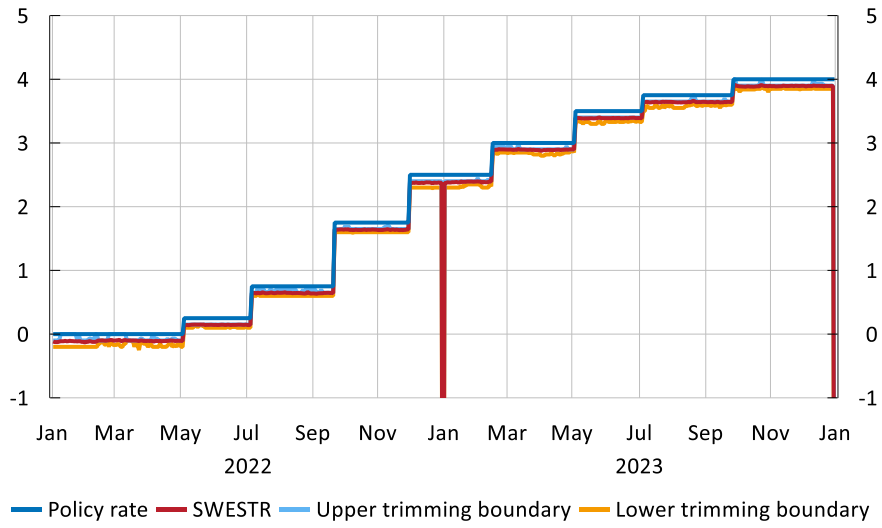
In terms of the volume-weighted average interest rate on transactions, overnight rates follow the policy rate closely, see Chart 12. The exception is at the turn of the year, when interest rates fall significantly (see Appendix). The SWESTR reference rate, shown in the chart, is based on unsecured transactions with maturity O/N where the reporters borrow funds from a wide group of counterparties. The dataset for SWESTR represents virtually the entire market at the current maturity. However, 25 per cent of the total transaction volume is removed by trimming in accordance with the SWESTR calculation method.²⁵ As shown in the chart, however, the interest rate levels at the so-called trimming boundaries also follow the policy rate closely. The trimming boundaries are the highest and lowest interest rates used in the calculation of SWESTR on that day. The difference between them is small and stable.

There is also some dispersion between the interest rates faced by different participants in the overnight market. This could reflect, on the one hand, the varying counterparty risk that unsecured transactions with the different participants pose to the reporters and, on the other hand, the competitive situation and established relationships in the market. However, transactions with interest rates that deviate significantly from the policy rate represent only a small part of the total market. In addition, they are usually removed by trimming the transaction dataset for SWESTR (Sveriges Riksbank, 2024c).

²⁵ For more information on the calculation method for SWESTR, see Sveriges Riksbank (2024c).

Chart 12. SWESTR and highest and lowest interest rates after trimming

Per cent



Source: The Riksbank

FACT BOX - Link between reference rates and the money market

Reference rates play an important role in financial markets. Reference rates are used to determine the value of financial instruments and other financial contracts so that it follows the general level of interest rates. These reference rates have a strong link to the money market, as they are usually based on, or intended to reflect, money market transaction rates.

Traditionally, interbank rates were based on the level of interest rates that panel banks reported charging for lending liquidity to other panel banks on an unsecured basis.²⁶ These rates were produced for a number of maturities, such as the three-month maturity, which is very important in Sweden. There was thus a clear link to the market for liquidity balancing between large banks, i.e. the interbank market. The Swedish reference rate STIBOR (Stockholm Interbank Offered Rate) is an example of such a rate. STIBOR was previously determined as an average of indicative prices for unsecured money market loans between the major banks. STIBOR has been substantially reformed in recent years. This is partly because this part of the money market has become less and less active at maturities beyond the shortest ones since the 2008 financial crisis. This is also due to the revelation of manipulation of the corresponding foreign benchmark rates and the introduction of the EU Benchmark Regulation (BMR). The purpose of reforming STIBOR has been to establish a clearer link to the transactions actually carried out on the money market, even if transactions in currencies other than Swedish kronor are also included.²⁷

With the same aim, the Riksbank has in recent years also launched the fully transaction-based reference rate SWESTR (Swedish krona Short Term Rate). SWESTR is based on overnight deposits from a wide group of counterparties with those of the Riksbank's monetary policy counterparties that are most active in the money market.²⁸ A broad definition of the transactions included in the transaction dataset ensures a stable development of the dataset and a robust volume of transactions. The vast majority of deposit transactions at the maturity in question are included in the SWESTR dataset. Of reporters' overnight borrowing volumes, more than 99 percent are included in the dataset for SWESTR.

²⁶ A panel bank is a bank that is on the panel of banks that determines the level of a reference rate based on submissions. In Sweden, it can be said that the STIBOR banks are the banks involved in setting STIBOR rates.

²⁷ For more information, see SFBF (2024).

²⁸ For more information, see Sveriges Riksbank (2024c).

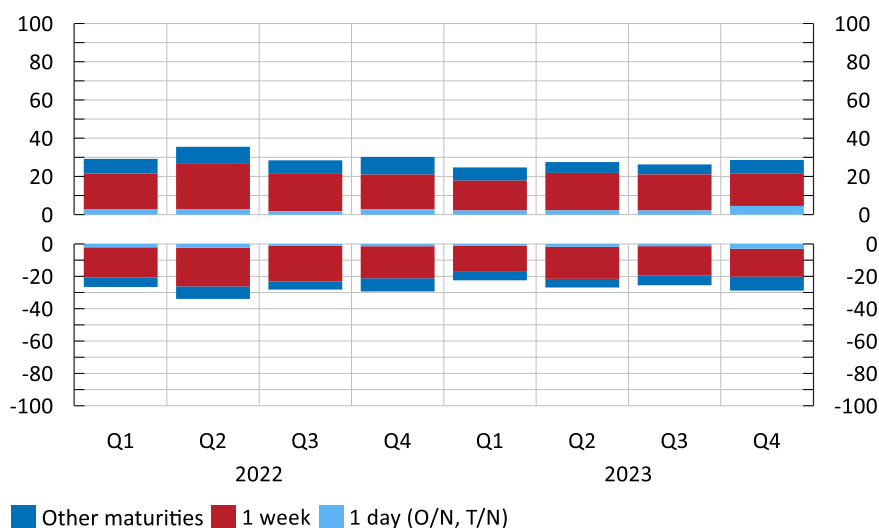
3.2 Repos²⁹

In the money market in Swedish kronor, secured loans and placements are conducted as repos.³⁰ A repo is a collateralised money market loan, where one party lends liquidity to the other in exchange for receiving debt securities as collateral. Repo is short for *repurchase agreement*. It is common to talk about the party borrowing liquid funds making a repo, while the party investing liquid funds, i.e. lending them, is said to be making a reverse repo. A repo and a reverse repo are thus two sides of the same coin, or the same transaction. If the borrower is unable to repay the repo at maturity, the collateral does not revert to the borrower but is retained by the lender. Repos therefore involve minimal counterparty risk.

Over the period 2022-2023, the traded volumes in the repo market in Swedish kronor have varied between quarters but have remained relatively stable, see Chart 13. The outstanding volumes have also seen a stable development, see Chart 14.

Chart 13. Volume traded in the repo market

Average daily volume, SEK billion



Note. The upper panel shows when reporters borrow cash. The lower panel when they lend cash. Both panels refer to maturities up to 10 days and to all collateral types.

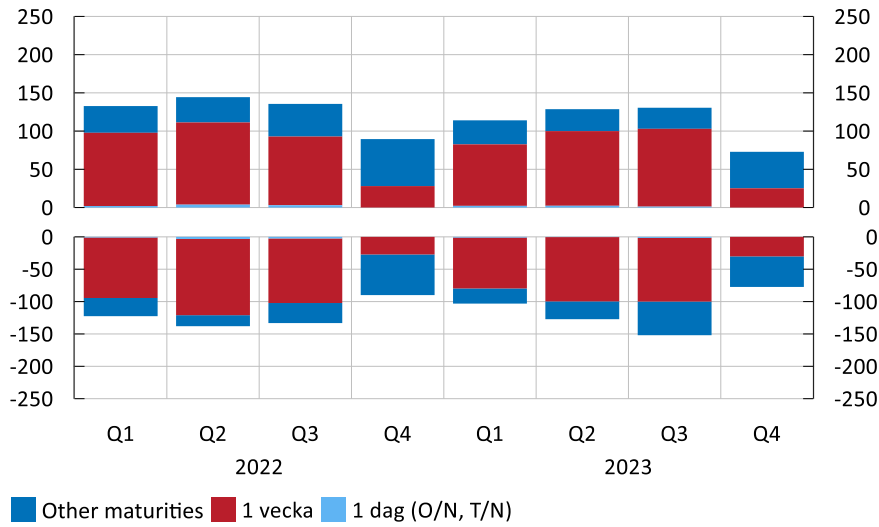
Source: The Riksbank (TORA)

²⁹ The SNDO is an important participant in the Swedish repo market for government bonds, mainly through its market-supporting repo facilities, see the fact box on page 31. However, the pricing of these repos does not vary with market rates, but the price is instead determined in relation to the Riksbank's policy rate. Therefore, we exclude all repo transactions with the SNDO. This applies to all the data presented in Section 3.2 as well as the estimated repo rates presented in Section 2.2.

³⁰ In the formal sense, repos in the Swedish money market are usually not actual repos but what are known as buy-sellbacks. The difference between the two forms is mostly of a legal nature, which is why we ignore this difference in this staff memo and still use the accepted term repo.

Chart 14. Volume outstanding in the repo market at the end of the quarter

SEK billion

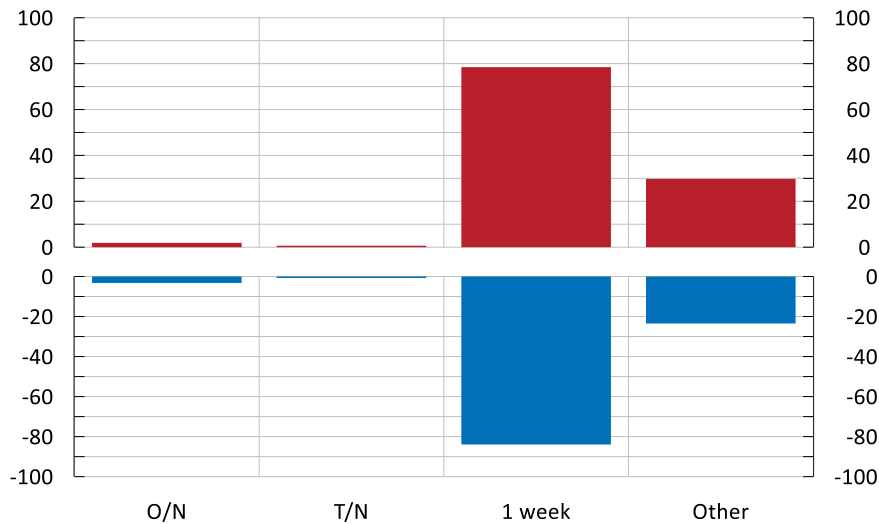


Note. Refers to contracts that have been settled but have not yet matured on the day in question. The upper panel shows when reporters borrow cash. The lower panel when they lend cash. Both panels refer to maturities up to 10 days and to all collateral types.

Source: The Riksbank (TORA)

Chart 15. Volume outstanding in the repo market on 31 August 2023

SEK billion

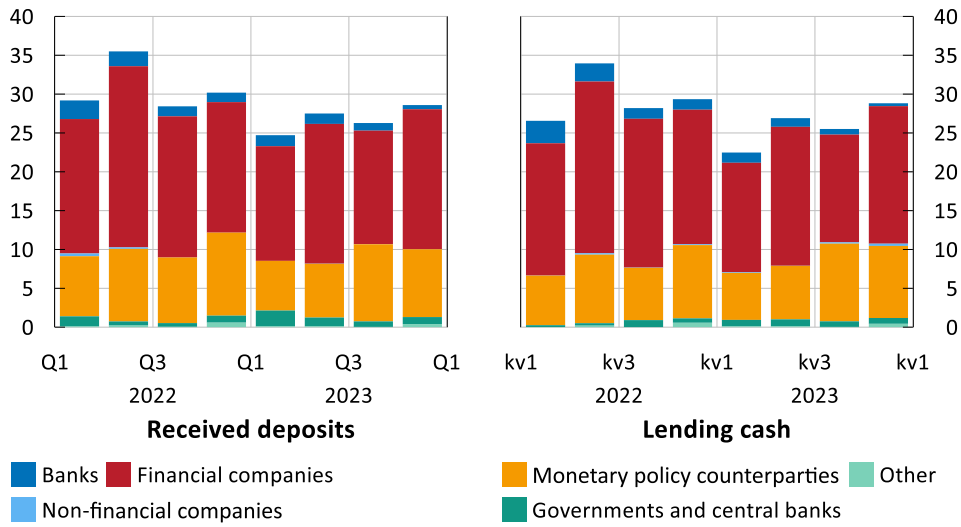


Note. Refers to contracts that have been settled but have not yet matured on the day in question. The upper panel refers to when reporters borrow cash. The lower panel when they lend cash. Both panels refer to maturities up to 10 days and to all collateral types. 31 August 2023 is intended to represent an ordinary day, unaffected by any effects around interest rate announcements or reconciliation dates, such as year-end or quarter-end.

Source: The Riksbank (TORA)

Chart 16. Reporters' counterparties in the repo market

Average daily volume, SEK billion



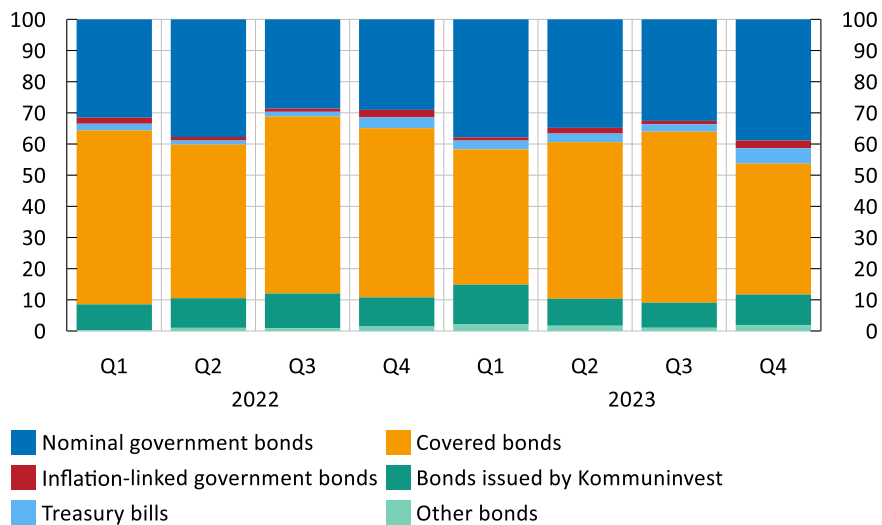
Note. Refers to average daily volume traded during the quarter in question. Refers to maturities up to 10 days and all types of collateral. The category “banks” should be interpreted as banks that are not also monetary policy counterparties. “Financial companies” are financial companies that are not also banks.

Source: The Riksbank (TORA)

As shown in the charts above, there is also a relatively good balance between reporters lending cash (receiving collateral) and receiving liquid funds (lending collateral). As Chart 16 shows, the most common counterparties of reporters in repo transactions are financial companies. Repo transactions between monetary policy counterparties are also common.

Chart 17. Volume traded in the repo market by type of collateral used

Percentage share



Note. Refers to volume traded during the quarter in question, all collateral types and to maturities up to 10 days.

Source: The Riksbank (TORA)

In repo transactions, the collateral used is more important for pricing than the identity of the counterparty.³¹ The higher the credit quality of the collateral, the lower the cost of borrowing liquidity against it. The most common collateral in the Swedish repo market is government bonds and covered bonds, see Chart 17. Repo transactions against Kommuninvest's bonds also occur.³² The SNDO offers market-supporting repo facilities to support the government bond market, including the market for repos against government bonds, see fact box on page 32.

The pricing of a repo can be regulated in two ways, either via the interest rate in the transaction or via the loan value of the collateral. The loan value is regulated by a so-called haircut. The usual way of regulating the pricing of a repo varies from one currency area to another: interest rate or haircut. In the Swedish fixed-income market, the price of a repo is determined primarily by the interest rate. Only a very small proportion of the repo transactions reported to the Riksbank have a haircut not equal to zero.³³

Repo transactions can be conducted for different purposes. As repos are a temporary exchange of liquidity for collateral, repos may be motivated partly by one participant wanting to borrow collateral and partly by the other participant wanting to borrow liquidity. According to anecdotal information from market participants, in Sweden repo transactions are most commonly motivated by the leg constituted by the security. However, the transaction data collected by the Riksbank from the repo market does not contain any information on the purpose of the transactions. Nevertheless, more than 98 per cent of repo transactions have a stated value of the nominal amount of the collateral that is in whole millions. For the cash amount, the corresponding share is less than 1 per cent. This supports the hypothesis that a large proportion of transactions in the Swedish market are carried out primarily because one of the participants wants to repo in or repo out the collateral.³⁴

Repos in Swedish kronor are usually made at a number of different maturities, all of which are still short. Most commonly, they are carried out with a one-week underlying maturity, and there is a one- or two-day löag between the trade being struck and its settlement, see the charts above and Chart 18. It is also very common

³¹ In the Swedish repo market, so-called simple repos are most common. This implies that a specific, pre-designated bond is the security in the repo. Abroad it is instead common that repos are made against a basket of government bonds, so-called general collateral. In that case the lender does not know in advance which bonds it will receive, only that it will receive government bonds issued by a certain country.

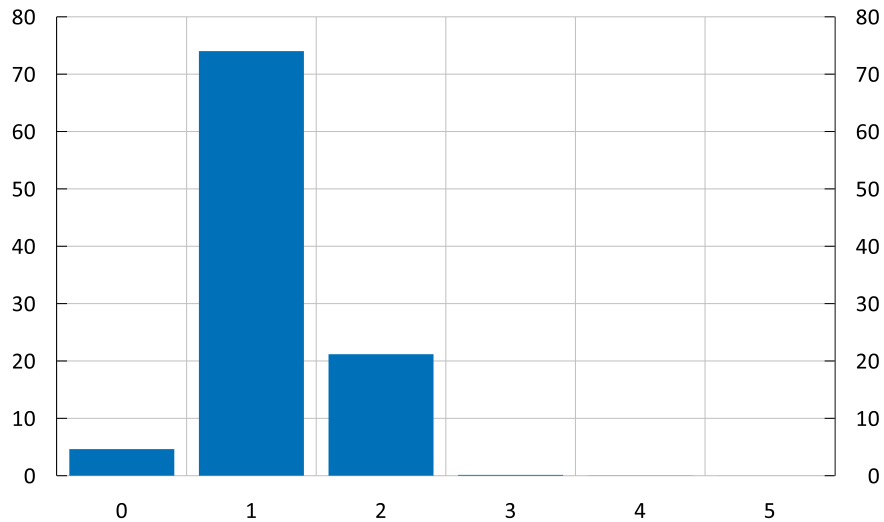
³² Kommuninvest i Sverige AB is a credit institution that is owned by and solely lends to Swedish municipalities and regions.

³³ According to the reporting instructions for the Riksbank's collection of transaction data from the money market, haircuts are to be stated as percentage points of the collateral's market value. Some transactions do have a stated haircut that is not equal to zero in the strict sense, but when rounded to whole percentage points are equal to zero. We consider these transactions as having a haircut of zero. Only just under 4 per cent of both the number of transactions and the total transaction volume do not have a haircut rounded to zero.

³⁴ It is reasonable to assume that an actor that conducts a repo transaction to receive a certain bond makes a contract to purchase a "round" volume of this bond, e.g. a volume in whole millions. The cash amount that the actor will need to temporarily part from will however be determined by the market value of the bond at the time of the trade and is thus rarely in whole millions. The same reasoning applies even when the bond is lent.

for one-week repos to be settled on Wednesdays, i.e. on the same day as the Riksbank’s weekly market operation.

Chart 18. Number of banking days between trade closure and settlement day
 Percentage share of total transaction volume in repos with one-week maturity



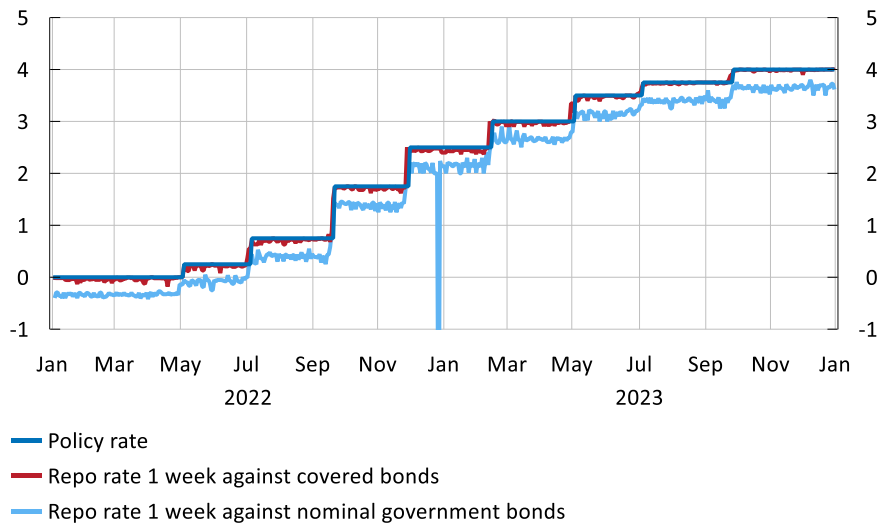
Note. Refers to all repo transactions with a one week underlying maturity. Refers to all collateral types. Data has not been adjusted for double counting of transactions between reporters.

Source: The Riksbank (TORA)

Volume-weighted average repo rates show a good correlation with the policy rate, see Chart 19. However, repos against government bonds are generally more expensive than repos against covered bonds. This is partly linked to the previous perceived shortage of government bonds in the financial markets. While repos against covered bonds usually trade at a rate close to the level of the policy rate, the price of repos against government bonds is closer to the floor implicitly set by the SNDO’s market-supporting facilities below this price, see the fact box on page 32.

Chart 19. Repo rates with a one-week maturity

Per cent



Note. Repo rates are volume-weighted. Transactions with the SNDO have been excluded.

Source: The Riksbank (TORA)

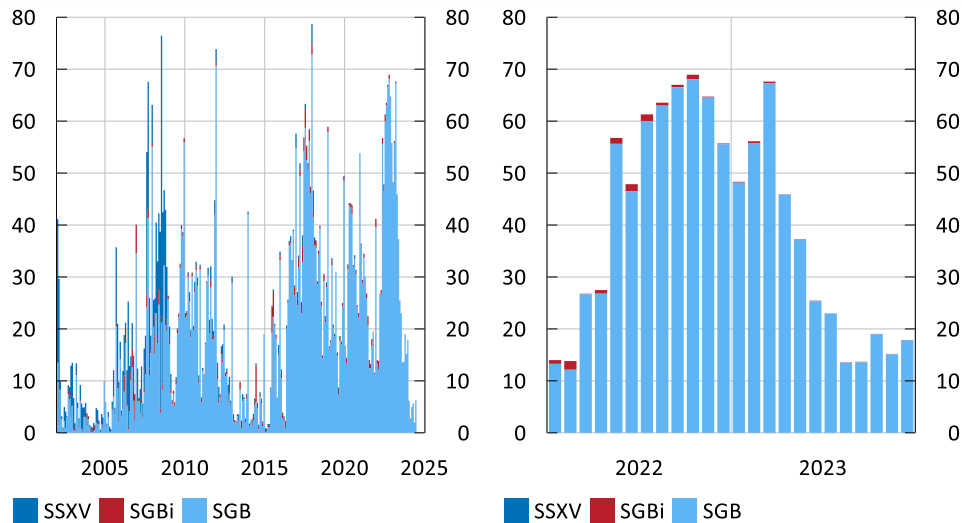
FACT BOX - The SNDO's market-supporting repo facilities³⁵

The SNDO offers repo facilities where dealers can borrow government bonds and treasury bills on a short-term basis in exchange for surrendering liquid funds or other government securities to the SNDO. The aim is to support the functioning of government bond markets by minimising the risk of supply problems, and to facilitate the role of dealers as market makers.

The SNDO offers dealers unlimited possibilities to repurchase government securities. This is done on an overnight basis (O/N) at a rate of 45 basis points below the policy rate, or tomorrow-next (T/N) 40 basis points below the policy rate.³⁶ Dealers can also enter into one-week repo swaps (T/W) at a cost of 30 basis points, but there are volume restrictions. Dealers almost borrow repurchase nominal bonds, see Chart 20. The T/N facility is the most widely utilised (see Blix Grimaldi and Hirvonen, 2023). In periods when there is a perceived shortage of government securities in the government bond and repo markets, utilisation of the facilities tends to be high, see Chart 20.

Chart 20. Utilisation of the SNDO's repo facilities

SEK billion, outstanding amounts at month-end



Source: SNDO via Macrobond

The SNDO's facilities act as a backstop for dealers' costs for repurchasing government bonds. The pricing therefore effectively sets an implicit floor for the pricing of corresponding repos in the private repo market.

³⁵ For more information on the SNDO's market-supporting repos and on pricing and utilisation over the years, see Blix Grimaldi and Hirvonen (2023).

³⁶ Newly introduced government bond issues can be repurchased at a more favourable rate for dealers, 10 basis points below the policy rate, as long as the outstanding volume of the issue is low.

3.3 FX swaps

An FX swap is a transaction in which two parties exchange liquidity in different currencies with each other. In the first stage, one party gives up Swedish kronor and receives foreign currency instead; at maturity, the party gets kronor back and returns the foreign currency. Similarly, the other party surrenders the foreign currency and receives kronor in the first stage, and returns kronor and recovers the foreign currency at maturity.³⁷

The FX swap market between kronor and foreign currencies is both large and deep, and participants domiciled in Sweden account for only a small part of this market.³⁸ This means that the transactions reported directly to the Riksbank do not provide a comprehensive picture of the market. In addition, many FX swaps are longer than 10 days, which is the upper boundary for money market transactions reported directly to the Riksbank. Nevertheless, this data can provide some insights into the FX swap market. This is particularly true if the data analysis is supplemented with data on FX swaps from the data collected in accordance with the EU's EMIR regulations, to which the Riksbank has access.³⁹

FX swaps are widely used to manage liquidity imbalances between different currencies, for example they are used by the major banks to convert short-term funding in dollars into kronor.⁴⁰ In line with this is the fact that monetary policy counterparties are to a large extent buyers of kronor in FX swaps, see Chart 21 and Chart 22. They are also used by larger Swedish investors who convert kronor into dollars to invest abroad. The size of the FX market in kronor, measured as the transactions reported directly to the Riksbank, decreased over the year 2023. This applies to both traded volume and outstanding volumes, see Chart 21 and Chart 22.

FX swaps with an original maturity of up to 1 year are common, see the right-hand panel of Chart 23. At the shortest maturities up to 10 days, it is most often mainly the O/N and T/N maturities that are used, see Chart 21 and Chart 22. At these short maturities, the most common counterparties to reporters in FX swap transactions are banks that are not monetary policy counterparties, see Chart 24. In many cases, these are large foreign banks.

³⁷ A spot FX swap is thus economically the same as a spot exchange and an FX forward.

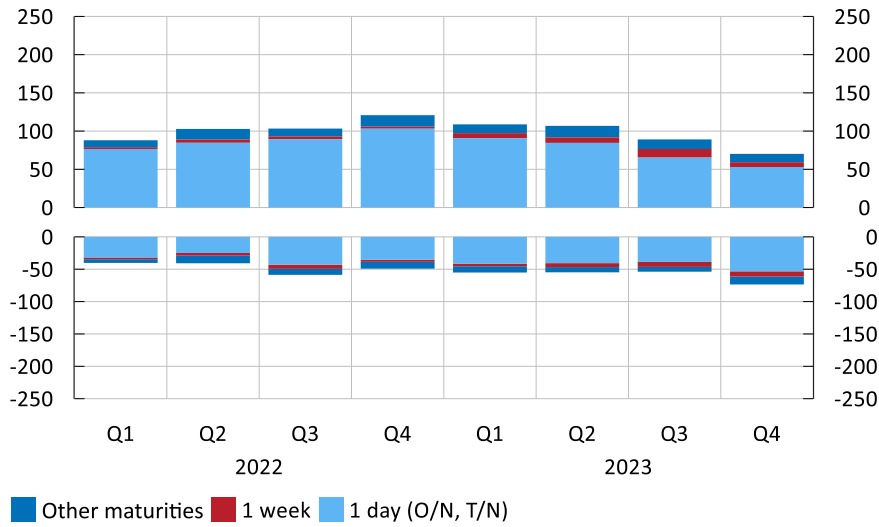
³⁸ According to the BIS Triennial Central Bank Survey, turnover in *over-the-counter* FX swaps involving Swedish kronor averaged just under USD 95 billion per day in April 2022, measured on what the BIS calls a 'net-net basis', meaning that the data are adjusted for double counting. Of this volume, around two-thirds was cross-border business, regardless of the reporter's domicile. According to the same source, less than 10 per cent of the total turnover in Swedish kronor (regardless of the instrument) takes place in Sweden. See BIS (2023) for more information.

³⁹ See the fact box at the end of this staff memo for more information about the data sources.

⁴⁰ For more information, see Sveriges Riksbank (2024a).

Chart 21. Volume traded in the short FX swap market

Average daily volume, SEK billion

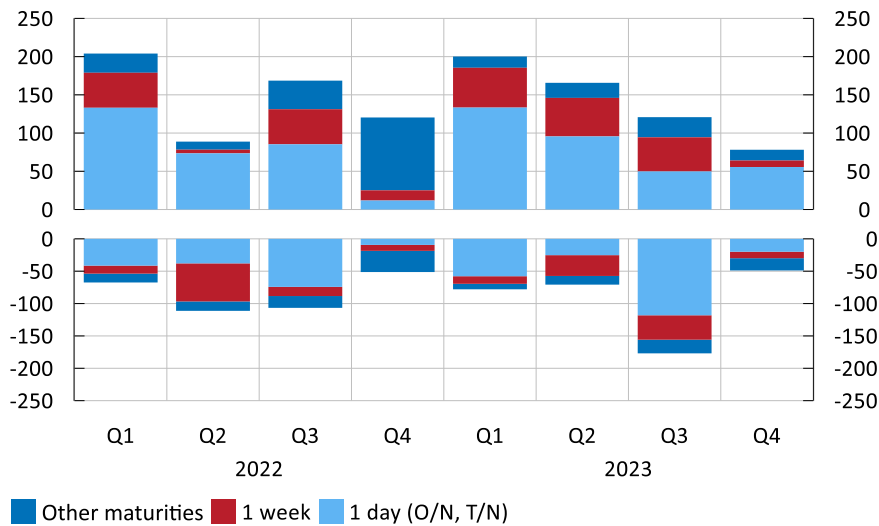


Note. The upper panel shows when reporters buy kronor. The lower panel when they sell kronor. Refers to FX swaps with one leg in SEK and maturities up to 10 days.

Source: The Riksbank (TORA)

Chart 22. Outstanding volume in the short FX swap market at the end of the quarter

SEK billion

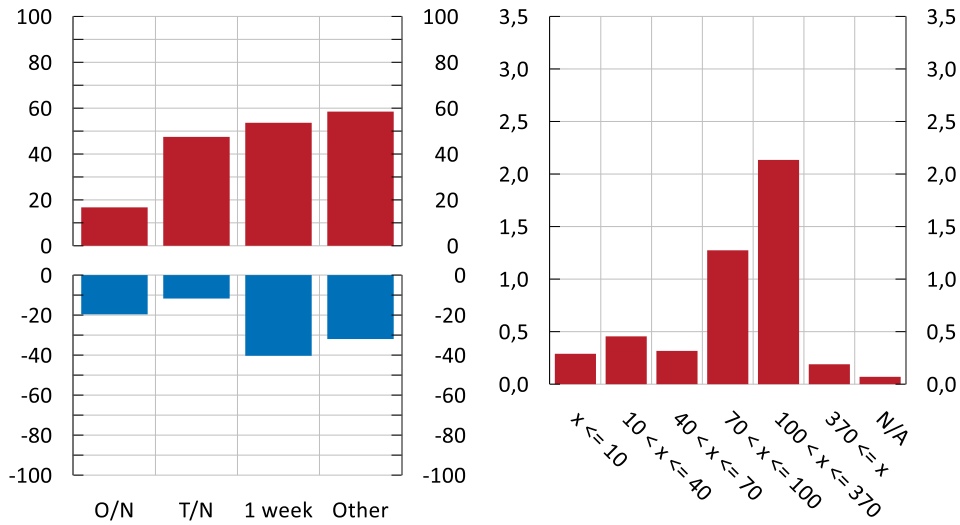


Note. Refers to contracts that have been settled but have not yet matured on the day in question. The upper panel shows when reporters buy kronor. The lower panel when they sell kronor. Refers to FX swaps with one leg in SEK and maturities up to 10 days.

Source: The Riksbank (TORA)

Chart 23. Outstanding volume in the FX swap market on 31 August 2023

SEK billion (left-hand panel), SEK trillion (right-hand panel)

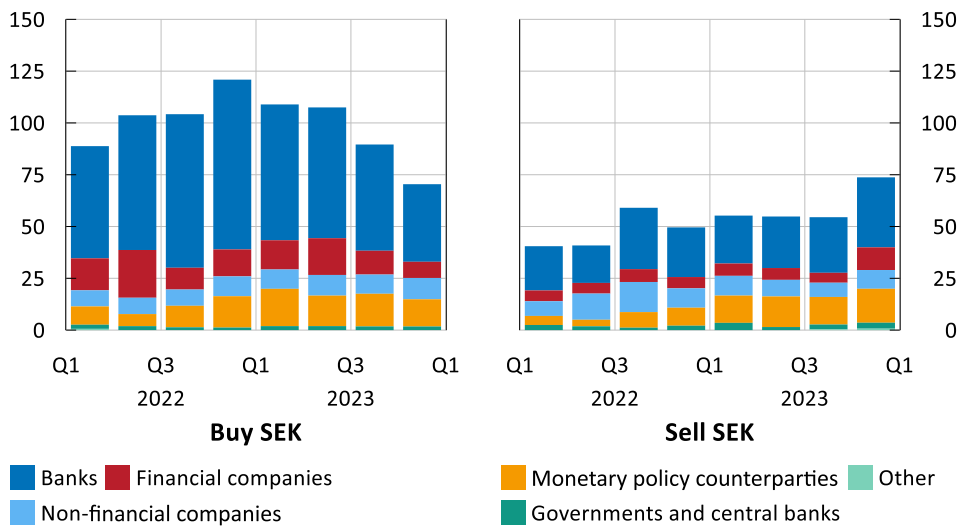


Note. Refers to FX swaps where one leg is in SEK. The data in the left-hand panel consist of data on short FX-swap reported directly to the Riksbank (TORA) and refer to maturities up to 10 days. The upper panel shows when reporters buy kronor. The lower panel when they sell kronor. These data refer to contracts that have been settled but not yet matured on the day in question. The data in the left-hand panel consist of EMIR data and apply to all maturities. These data show all contracts that are outstanding and have not yet matured on the 31 August 2023. The number of days between trade date and maturity date is shown on the x-axis. 31 August 2023 is intended to represent an ordinary day, unaffected by any effects around interest rate announcements or important reconciliation dates, such as year-end or quarter-end.

Source: The Riksbank (TORA) and EMIR

Chart 24. Reporters' counterparties in the short FX swap market

Average volume in short FX-swaps per day in SEK billion



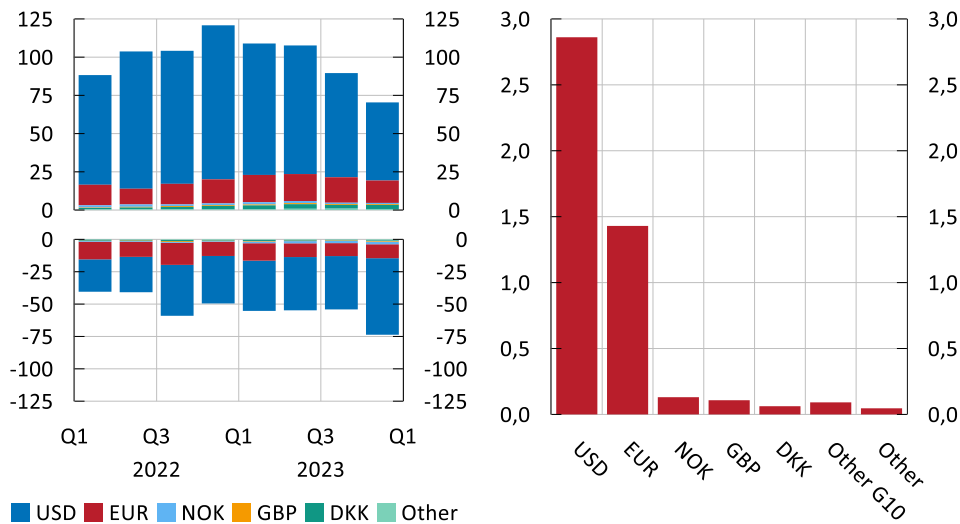
Note. Refers to FX swaps with one leg in SEK and maturities up to 10 days.

Source: The Riksbank (TORA)

FX swaps that have Swedish kronor in one leg usually have dollars in the other leg, see Chart 25. This is not surprising given that Swedish banks tend to borrow their short-term funding in dollars and then convert this into kronor using FX swaps, while investors often convert kronor into dollars to invest abroad. However, FX swaps against euros are also common.

Chart 25. FX swap market by the foreign currency in the swap

Left-hand panel: Average volume in short FX-swaps per day in SEK billion
 Right-hand panel: Outstanding volume in FX-swaps 31 August 2023 in SEK trillion



Note. Refers to FX swaps where one leg is in SEK. The data in the left-hand panel consist of data on short FX-swap reported directly to the Riksbank (TORA) and refer to maturities up to 10 days. These data refer to the average daily volume per day during the respective quarters. The upper panel shows when reporters buy kronor. The lower panel when the sell kronor. Other currencies include G10 as well as non-G10. The data in the left-hand panel consist of EMIR data and apply to all maturities. These data show all contracts that are outstanding and have not yet matured on the 31 August 2023. 31 August 2023 is intended to represent an ordinary day, unaffected by any effects around interest rate announcements or important reconciliation dates, such as year-end or quarter-end.

Source: The Riksbank (TORA)

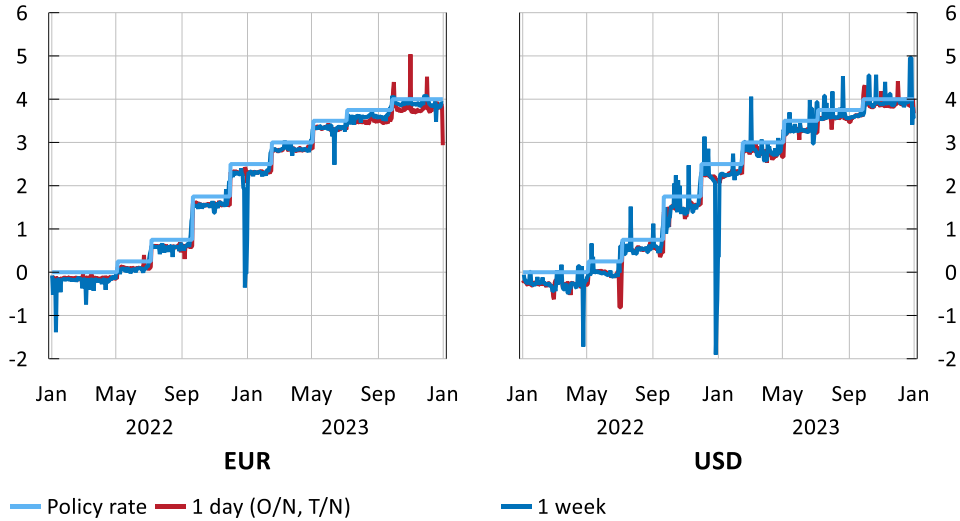
Prices of FX swaps are quoted in the form of so-called forward points. These are calculated on the basis of expected interest rates in the two currencies over the life of the swap, but may also vary according to the supply and demand for liquidity in the different currencies and the relative bargaining power of the parties. The forward points are added to the spot rate, which is used in the first leg of the swap. This is to obtain the forward rate used to determine the cash flows at maturity. Based on the forward points and an assumption about the foreign interest rate, it is therefore possible to calculate the interest rate level implied by the FX swap in Swedish kronor. By design, FX swaps thus reflect interest rate differentials in different currency pairs.

As Chart 26 below shows, there has been relatively good correlation with the policy rate and the implied rates that can be calculated based on FX swaps between Swedish kronor and euro and dollar, respectively. This is mainly the case for those rates that

can be calculated using FX swaps against euros and reference rates in euros, while the consistency has been less favourable for those rates calculated from dollars.

Chart 26. Implied rates from FX swaps

Per cent



Note. Refers to FX swaps with one leg in SEK and maturities up to 10 days. For the calculation of the implied interest rates, the average €STR and SOFR (*ex-post*) over the life of the swap have been used as the foreign interest rate.

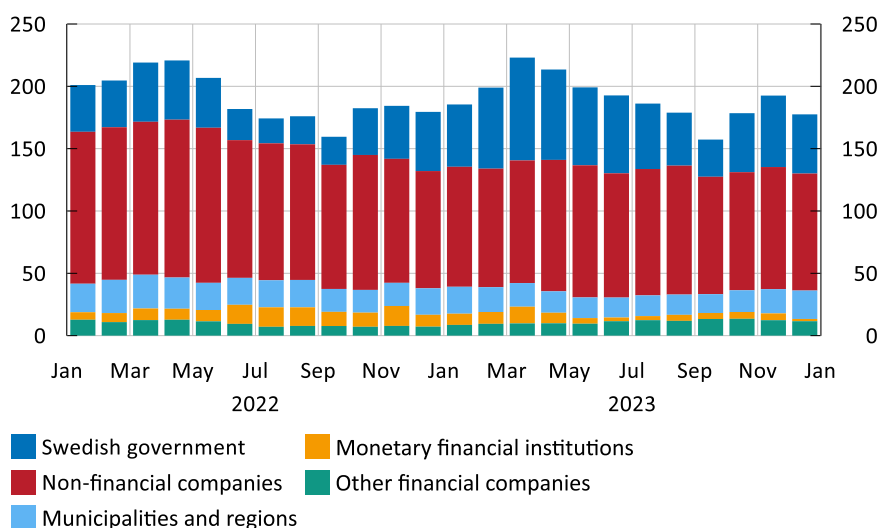
Source: The Riksbank (TORA)

3.4 Short-term securities⁴¹

Money market instruments also include debt securities with an original maturity of one year or less and no coupon payments. These securities are known as discount securities. This means that the yield regulates the difference between the amount received by the borrower when the security is issued (the issue proceeds) and the amount repaid to the depositor at maturity.⁴² These types of instruments are usually referred to as certificates; for example, Riksbank certificates are of this type, see fact box on page 9. When the SNDO issues discount securities, they are called treasury bills. In English, they are usually referred to as commercial paper, when issued by a non-financial company. In Swedish, the term *certifikat* is used also for these.

Chart 27. Outstanding volume of short-term debt securities

SEK billion



Note. Refers to all debt securities with an original maturity of 370 days or less and denominated in SEK. Note that the SNDO sometimes also issue treasury bills with an original maturity exceeding 370 days, securities that accordingly are not shown in this chart. Securities issued by the Riksbank have been excluded.

Source: SVDB

The outstanding volumes of certificates have varied over the period 2022-2023, which has mainly been driven by the SNDO increasing its issuance of treasury bills during parts of the period, see Chart 27 and Chart 29.⁴³ In addition to the SNDO, issues of commercial paper are mainly used by large non-financial companies to raise short-term funding and operating liquidity. Large non-financial companies often have

⁴¹ In this staff memo, we focus on the parts of the money market where interest rates and issued volumes are not determined by policy decisions, but rather by the market forces. Hence we exclude the issues of Riksbank Certificates throughout. This applies to all of Section 3.4.

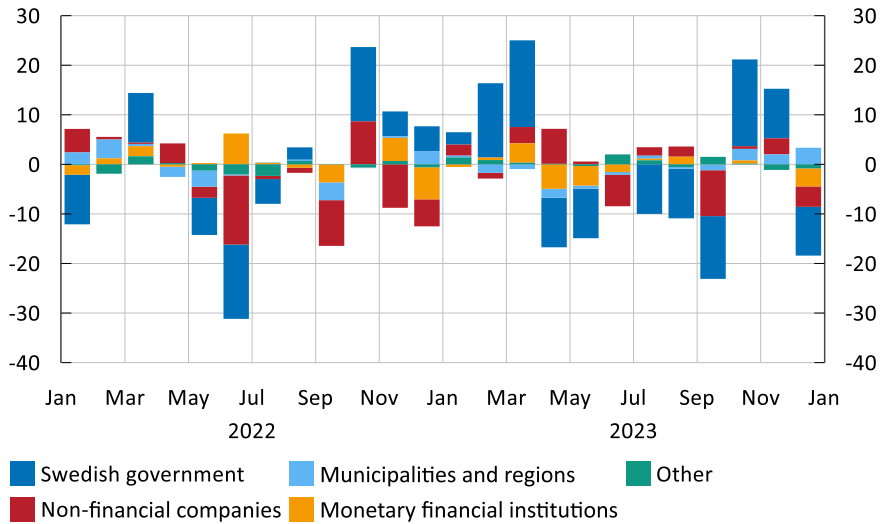
⁴² The issue proceeds are thus the present value of the notional amount of the instrument. The present value is the discounted value of the notional amount, hence the name.

⁴³ The Riksbank is also a large issuer of certificates. Rates and volumes on these are determined through policy decisions and we therefore disregard these in this staff memo, see footnote 41.

commercial paper programmes that allow them to easily issue securities under existing arrangements.

Chart 28. Net issuance of short-term debt securities

SEK billion



Note. Refers to all debt securities with an original maturity of 370 days or less and denominated in SEK. Note that the SNDO sometimes also issue treasury bills with an original maturity exceeding 370 days, securities that accordingly are not shown in this chart. Securities issued by the Riksbank have been excluded.

Source: SVDB

The SNDO usually issues treasury bills with a maturity of either around three months or 12 months, see Chart 29. The issue rates on treasury bills show a good correlation with the expectations of the future policy rate that can be inferred from OIS contracts, see Chart 30. By contrast, commercial paper is most commonly issued with a maturity of around three months, see Chart 29.

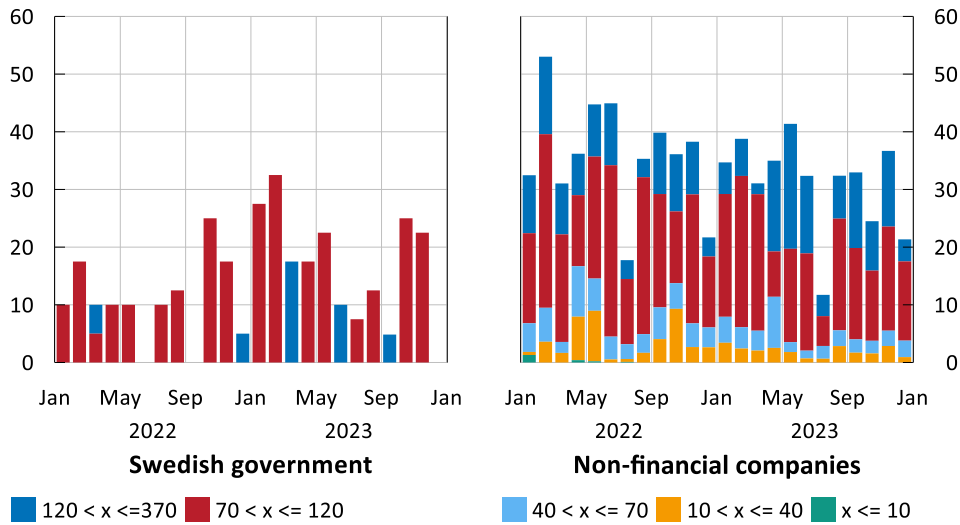
Historically, Swedish banks were also major borrowers on the Swedish short-term debt market.⁴⁴ But today, Swedish banks mainly use the much deeper dollar money market to raise liquidity, and then convert this into Swedish kronor using FX swaps.⁴⁵ However, banks are still important participants in the Swedish market, as they usually act as dealers or intermediaries in the transactions. They act as intermediaries when, for example, a large non-financial company issues commercial paper (i.e. the primary market) and hold so-called inventories of commercial paper from which they buy and sell securities (secondary market).

⁴⁴ For more information, see Nyberg, Viotti and Wissén (2014).

⁴⁵ For more information, see Sveriges Riksbank (2024a).

Chart 29. Gross issuance of short-term debt securities

SEK billion

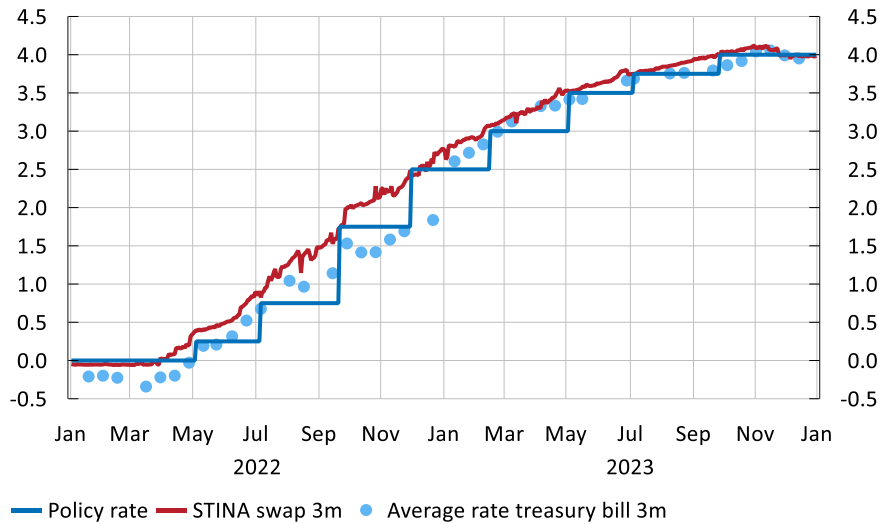


Note. Refers to all debt securities with an original maturity of 370 days or less and denominated in SEK. Note that the SNDO sometimes also issue treasury bills with an original maturity exceeding 370 days, securities that accordingly are not shown in this chart.

Source: SVDB

Chart 30. Treasury bill issue rates

Per cent



Note. Refers to the average interest rate in the SNDO's issues of treasury bills with a remaining maturity of 120 days or less. The STINA 3m can be considered the market implicit expectation of the average level of the policy rate during the upcoming three months, see Section 3.5.

Source: SNDO, the Riksbank

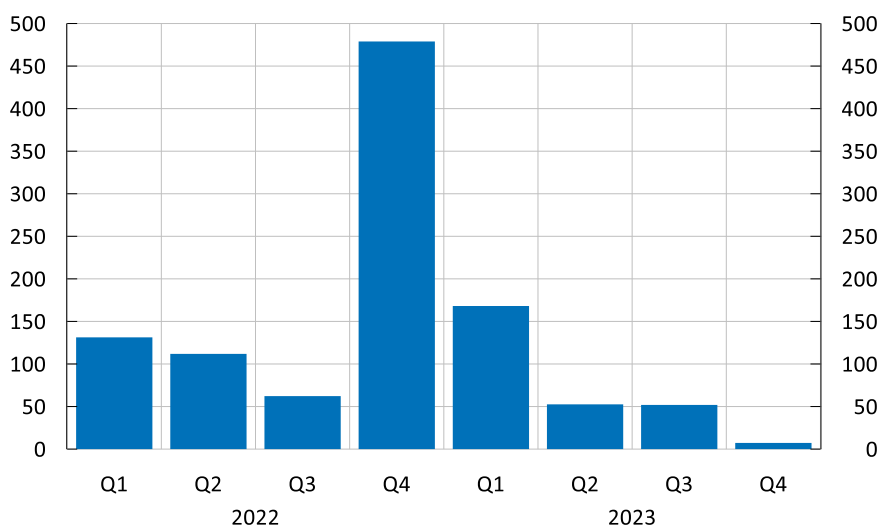
3.5 OIS contracts

An OIS contract is an interest rate swap⁴⁶ where the short leg is determined by a reference rate with a very short maturity.⁴⁷ OIS is an abbreviation of the term *overnight index swap*. In Swedish kronor, there are OIS contracts against two reference rates: STIBOR T/N and SWESTR.⁴⁸ An indicative level for an OIS contract thus becomes a measure of the expected level of the reference rate over the life of the swap. The shortest reference rates are usually close to the level of the policy rate and show a good correlation with it, see Chart 3. Therefore, OIS contracts can be used to explore the market-implied expectation of future policy rates.

The swaps against STIBOR T/N are usually referred to as STINA swaps. The volumes traded are relatively small and vary widely between quarters, see Chart 31. However, the main use of STINA swaps in the Swedish fixed-income market is as a valuation curve, which is used to establish market values for other fixed-income instruments.

Chart 31. Turnover in STINA swaps⁴⁹

Nominal amounts in SEK billion



Note. Summed volume during the quarter in question. Refers to values adjusted for double counting between reporters.

Source: The Riksbank (SELMA)

⁴⁶ An interest rate swap is a financial instrument where parties exchange interest flows with each other. Most commonly, the parties exchange a fixed rate with a floating rate, which is determined by a reference rate.

⁴⁷ Other than OIS contracts, there are interest rate swaps against other reference rates. These reference rates then have longer maturities, often three or six months. Unless explicitly specified that it is an OIS contract that one is referring to, it is these swaps that is often referred to. Interest rate swap of this kind are not usually considered part of the money market, however. In Sweden, most interest rate swaps are against STIBOR 3m.

⁴⁸ Of these two reference rates, only SWESTR is an overnight rate in the strict sense, but STINA swaps are also commonly regarded as OIS contracts.

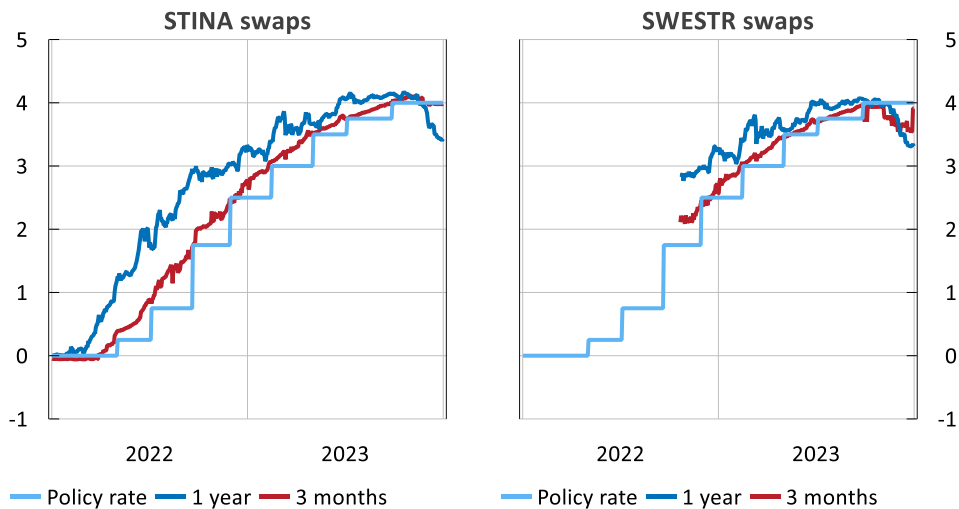
⁴⁹ The large turnover in the fourth quarter of 2022 is largely driven by one single day, 24 October 2022, when 370 billion were traded.

Market participants could start to use SWESTR as a reference rate in financial contracts from 1 September 2021. OIS contracts with SWESTR as a variable rate have subsequently been launched, and traded volumes have increased over 2023. The central counterparty London Clearing House (LCH) publishes monthly data on OIS contracts against the new transaction-based reference rates which are cleared through them.⁵⁰ During the second half of 2023, there were newly registered SWESTR OIS contracts for on average just shy of SEK 100 billion per month. SWESTR is often affected by a significant year-end effect (see Appendix), which is why it is unusual for SWESTR contracts to be traded over a turn of the year. At the end of December 2023, there were, according to data from LCH, the notional value of the outstanding OIS contracts against SWESTR was about SEK 100 billion. At the end of November the same year, the outstanding notional value was more than SEK 400 billion.

Over the period 2022-2023, the interest rate on OIS contracts in SEK broadly followed the policy rate, see Chart 32. Uncertainty about the future path of the policy rate was high, especially in 2022 and at the end of 2023. As a result, the indicative price levels of OIS contracts were significantly more volatile than they have been in recent years.

Chart 32. Indicative price levels for OIS contracts in SEK

Per cent



Source: Bloomberg

⁵⁰ Data is published by LCH on their website in billions of dollars, rounded to the nearest billion. These values have been recalculated to Swedish kronor using the exchange rate USDSEK at the end of month before other calculations are made. See also LCH (2024).

FACT BOX – Data sources

In addition to publicly available data from, for example, the Riksbank, the SNDO and Bloomberg, this staff memo uses a number of non-public data sources to which the Riksbank has access. These data sources are described here.

TORA The Riksbank's monetary policy counterparties are obliged, in accordance with the *Terms and Conditions for RIX and monetary policy instruments*, to report information on their transactions on the short-term money market to the transaction reporting system TORA. The monetary policy counterparties with the highest transaction activity are required to report their transactions on a daily basis, the rest on an annual basis. What is reported is detailed information on unsecured transactions (unsecured loans or deposits), secured transactions (repos) and FX swaps, in all cases with a maturity of up to and including ten days. The TORA data are considered to have very good market coverage in the unsecured and repo segments, as the participants reporting their transactions are collectively dominant in this segment. Significantly more participants than TORA reporters are largely active in FX swaps, and market coverage in this segment is thus not as good. A subset of the TORA data forms the basis for the transaction-based reference rate SWESTR. Otherwise, there is currently no ongoing external publication of statistics based on the TORA data.

SELMA The Riksbank's monetary policy counterparties are also obliged to report their turnover in debt securities and interest rate derivatives to the transaction reporting system SELMA. The five largest monetary policy counterparties, as well as Barclays in its capacity as dealer for the SNDO, report information on their aggregated turnover on a daily basis in a number of different categories of fixed-income instruments, broken down by counterparty category and direction of the transaction (buy/sell). The Riksbank regularly publishes aggregated SELMA data.

The Swedish Securities Database (Svensk Värdepappersdatabas, SVDB) SVDB contains detailed information on a monthly basis on all outstanding securities from issuers with a Swedish company registration number. Data are compiled by Statistics Sweden on behalf of the Riksbank based on information from Euroclear and the ECB's Centralised Securities Database (CSDB), as well as direct reporting from some large issuers. Statistics Sweden publishes monthly statistics based on the database.

EMIR In accordance with the EU's EMIR regulations, all derivative contracts concluded where one of the parties is domiciled in the EU must be reported to a so-called trade repository, which collects information on derivative contracts concluded.⁵¹ Trade repositories in turn report this data to the European Securities and Market Authority (ESMA). The Riksbank has access to information on derivative transactions that fulfil one of the following requirements: (i) one or both parties are domiciled in Sweden, (ii) the derivative is wholly or partly denominated in SEK, or (iii) the derivative is cleared by a Swedish central counterparty.

⁵¹ EMIR refers to Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories, and the rules resulting from it.

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⁵² An English version is forthcoming.

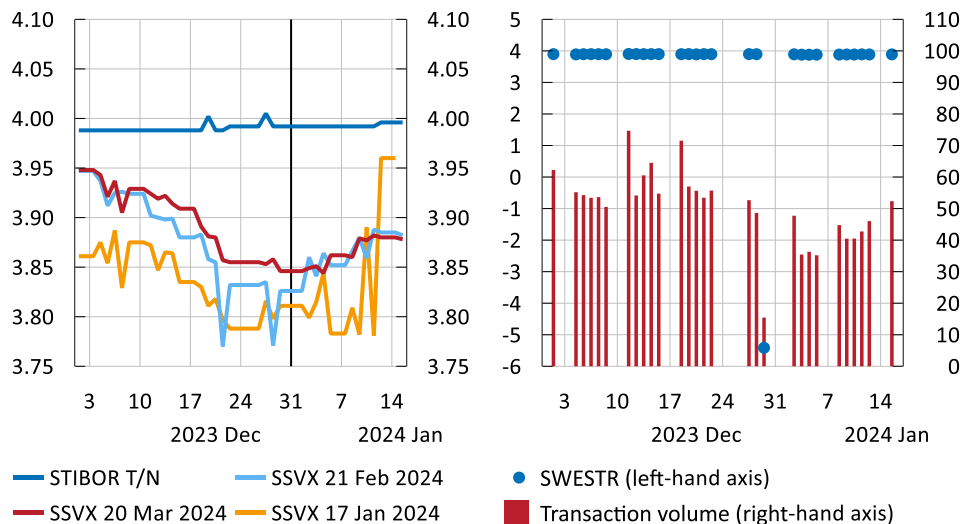
APPENDIX - Year-end effects in the money market

Interest rates and activity levels in the Swedish money market fall significantly ahead of year-end. This is largely due to banks and other participants trying to adjust their balance sheets before the important reconciliation day at the end of the year. Banks' actions to minimise their costs contribute to this development.

Activity and interest rates in the money market are largely influenced by the incentives for the major banks created by the Riksbank's operational framework (see Section 2 in the main text). This is combined with taxes and fees, as well as various regulations affecting banks, for example regarding their liquidity buffers. The fact that major participants in financial markets try to make their balance sheets look nicer ahead of important reporting dates is not a new phenomenon. For example, participants may seek to adjust their balance sheet to reduce regulatory costs. In the Swedish money market, this *window dressing* is particularly evident prior to the turn of the year.

Chart 33. Year-end effects in money markets ahead of the turn of the year 2023

Interest rates in per cent and SEK billion



Note. The left-hand panel shows interest rates in per cent for selected money market rates. SSVX refer to the rate on treasury bills with different maturity dates early in 2024. The interest rates refer to the secondary market. The right-hand panel shows the interest rate in per cent and transaction volume in SEK billion for SWESTR.

Source: Riksbank, Bloomberg

The fact that the Swedish money market in particular is being so substantially affected prior to the turn of the year is largely due to several of the leading banks paying both the domestic bank tax and the EU-wide resolution fee. Both are based (somewhat

simplified) on banks' year-end balance sheet totals. This means that banks have an incentive to minimise their balance sheet total on the day in question and therefore reduce their deposit rates to very unfavourable levels. In this way, banks make it unattractive for customers to invest money with them and/or compensate themselves for the additional regulatory costs of the transactions.

An important reason why the money market is so affected at the turn of the year is that many money market instruments have a large impact on banks' total balance sheets. This is despite the fact that they have a relatively small interest rate risk. The price impact is therefore very high at the turn of the year compared to other days. Another way in which banks are trying to reduce their balance sheet total is that they try to steer customers towards investing their liquidity in short-term debt securities purchased on the secondary market. These can be treasury bills, for example. This has the effect of transmitting the year-end effect to this part of the money market, as demand for these securities increases.

Most notable is the year-end effect in SWESTR, where both the interest rate and the underlying transaction volume are significantly affected, see Chart 33. STIBOR T/N, however, does not fall in the same way. This is because the methodology for calculating STIBOR allows significant deviations from the basic principle that the panel banks' submissions should reflect the interest rates of the underlying transactions on the days when the balance sheet is charged with fees (SFBB, 2024).



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