

The Riksbank's monetary policy operational framework after the 2019-2022 reform

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The Riksbank uses its operational framework for monetary policy to implement the decided level of the policy rate in the market. This is done by stabilising the shortest money market rates sufficiently close to the policy rate. The interest-rate level established by the Riksbank then spreads to market rates with longer maturities, thereby also affecting the interest rates faced by households and companies. In practice, this is done by the Riksbank conducting, or offering to conduct, financial transactions with a limited group of financial agents.

In June 2022, the Riksbank finalised a reform of the operational framework for monetary policy. In this article, we describe the design of the reformed system and the considerations behind the design. In addition, we discuss the extent to which the operational framework functions as intended, and how its design relates to the operational frameworks of other central banks.

1 The monetary policy operational framework implements the decided policy rate level in the money market

The Riksbank's overriding objective for monetary policy is to maintain sustainably low and stable inflation.¹ The Riksbank's main tool for conducting monetary policy and achieving this objective is the policy rate. The monetary policy operational framework, in turn, exists to implement the decided policy rate level in the market. This means

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¹ The Sveriges Riksbank Act (SFS 2022:1568) stipulates that monetary policy shall be aimed at achieving sustainably low and stable inflation. When the reformed operational framework gradually entered into force in 2019-2022, the previous Sveriges Riksbank Act (SFS 1988:1385) was in force. This stated that "the objective of the Riksbank's operations shall be to maintain price stability". The Riksbank interprets its task in the same way now as it did under the previous act, namely as maintaining a stable low inflation rate. It is the Executive Board of the Riksbank that decides what level the policy rate should be at to best provide sustainably low and stable inflation.

that the framework is used to conduct both expansionary and contractionary monetary policy.

Within the scope of the operational framework, the Riksbank offers a limited group of agents the opportunity to enter into financial transactions with the Riksbank. This means that these agents, known as monetary policy counterparties, are given an opportunity to invest or borrow cash via the Riksbank, and that the Riksbank can control their cost for short-term liquidity balancing.² In this way, the Riksbank can also influence interest-rate formation for equivalent or close substitutes for these transactions in money markets with short maturities (short-term money markets). The interest-rate level established by the Riksbank in these short-term money markets then spreads to market rates with longer maturities, thereby also affecting the interest rates faced by households and companies. In this way, the Riksbank can influence interest-rate formation, and ultimately also the real economy and inflation.

In June 2022, the Riksbank finalised a reform that had been ongoing for a number of years. The reform concerned the monetary policy operational framework.³ The reform was implemented because there was a need to manage and improve the existing framework that had been in place since 1994. The aim was to improve the steering of interest rates, to adapt the operational framework to developments in payment and financial markets in recent decades and to better equip the operational framework for future developments in these markets.

In this article, we explain how the operational framework is designed and why it looks the way it does. We also briefly discuss the extent to which the operational framework is working as intended - whether it is achieving its objective, and how it relates to the operational frameworks of other central banks and their developments since the financial crisis.

Within the framework of the operational framework, the Riksbank can use a number of different instruments in addition to those described in this article. We focus on how the operational framework is used to implement the decided level of the policy rate. We therefore present only the instruments used to steer market interest rates at the shortest maturities and to influence the liquidity position of the banking system in the short term. Consequently, we do not discuss other instruments that the Riksbank can use, or that are used for reasons other than implementing the level of the policy rate. Thus, we do not address the Riksbank's purchases and sales of securities in the

² A central bank selects its set of monetary policy counterparties on the basis of those agents deemed important for monetary policy transmission. Typically, the counterparties are credit institutions, but may also include other types of financial agents (Hansson and Wallin Johansson, 2023). The Riksbank's monetary policy counterparties are credit institutions domiciled in, or with a branch in, Sweden, see Section 4.3.

³ See the Appendix for a summary of the changes. See also the consultation The Riksbank's new operational framework for the implementation of monetary policy and the decisions on the reform on 24 September 2019 and 22 March 2022 for a more detailed description of the changes made and the reasons behind them.

secondary market, which affect longer-term market interest rates and the liquidity position in the longer term, or the Riksbank's use of FX swaps.⁴

The article starts with a section explaining the basics of how an operational framework for monetary policy functions. Section 3 then describes the most important objectives and constraints that have formed the basis for the design of the Riksbank's operational framework. In Section 4 we describe the design of the operational framework and the main motivations behind this design. The section is divided into three parts: one for each basic component of the operational framework, which are instruments, collateral and counterparties. In Section 5, we evaluate whether the operational framework functions as intended, that is, whether it succeeds in stabilising short-term market rates close to the policy rate. Section 6 sheds light on the Riksbank's operational framework in an international context and Section 7 consists of some concluding remarks.

2 Basics of how an operational framework functions

At the heart of an operational framework for monetary policy lies the central bank's ability to set the price of money, that is, to determine the interest rates at which monetary policy counterparties can borrow and deposit cash with the central bank. This allows the central bank to influence the incentives for monetary policy counterparties related to their short-term liquidity balancing and to steer the interest-rate formation at the very short end of the money market.

When a counterparty deposits money with the central bank, they are said to hold central bank reserves, i.e. they have a claim on the central bank in the domestic currency. As the central bank is the most creditworthy player in the domestic currency, such a claim is a largely risk-free investment.

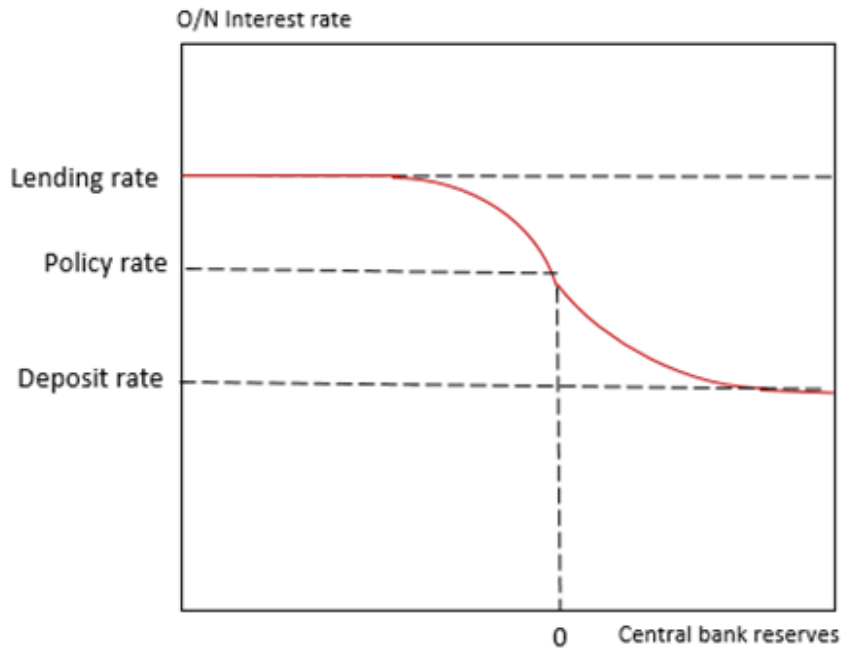
The central bank usually also lends liquidity to its monetary policy counterparties. It usually does so at a higher interest rate than it pays on central bank reserves, see Figure 1 below. The two interest rates form the interest rate corridor of the operational framework. The deposit rate, i.e. the interest rate received by monetary policy counterparties for deposits (central bank reserves), constitutes the floor of the interest rate corridor. The lending rate, that is, the interest rate they pay on loans from the central bank, is the ceiling of the corridor.

The fact that there is a difference between deposit and lending rates can create an incentive for counterparties to manage their liquidity in the market rather than with the central bank. If one monetary policy counterparty has a need to deposit while another needs to borrow, they can meet in the market and agree on an interest rate that lies between the rate they would receive and that they would pay at the central bank. This means that the interest rate corridor imposes boundaries for the interest-

⁴ The Riksbank can use FX swaps within the scope of the operational framework to stabilise the overnight rate, but does that only in exceptional cases to prevent specific currency-related flows from affecting the overnight market in Swedish krona.

rate formation between monetary policy counterparties in the overnight liquidity balancing market, that is, the core of the unsecured overnight market.

Figure 1. Illustration of the demand for central bank reserves



Source: The Riksbank

A key difference between different central banks' operational frameworks relates to how the central bank's main policy rate relates to the deposit rate and the lending rate, as well as whether the central bank has a predetermined idea of how much central bank reserves the central bank's counterparties should hold, see the fact box below.

In corridor systems, the main policy rate usually represents the centre of the interest rate corridor, while in floor systems it usually corresponds to the deposit rate. In a corridor system, the central bank usually provides the amount of central bank reserves requested by the counterparties at the current interest-rate level, while a central bank with a floor system provides more central bank reserves than requested.

The relationship between the central bank's main policy rate and the deposit and lending rates is also indicative of where in the interest rate corridor the central bank wants to stabilise short-term market interest rates and what additional deposit and lending opportunities it offers, i.e. what transactions the central bank offers to carry out.

The Riksbank applies a symmetrical corridor system, which means that the distance between the deposit rate and the policy rate is the same as the distance between the

lending rate and the policy rate. It also means that the Riksbank wants to stabilise short-term market rates in the middle of the corridor.

The total amount of central bank reserves is always determined by the central bank, as only it can change the overall liquidity position of the banking system with regard to the central bank. Normally, the Riksbank provides the amount of reserves requested by the banking system at the current interest-rate level. In addition, the amount of reserves may be larger than the banking system requires as a result of, for example, supplementary monetary policy measures such as asset purchases and the Riksbank funding the FX reserve by borrowing Swedish kronor from the banking system. This creates central bank reserves, or claims on the central bank that monetary policy counterparties have no choice but to place funds in the central bank.

Fact box: Types of operational framework⁵

Corridor system

In a corridor system, the central bank steers the overnight rate between monetary policy counterparties towards the centre of the corridor, on a level with the main policy rate. The primary policy rate is usually at the same distance from the corridor floor, the deposit rate, as from the corridor ceiling, the lending rate. The central bank uses market operations to either supply or drain liquidity so that the liquidity position of the banking system with regard to the central bank on a daily basis is close to zero, i.e. the system is in balance. This steers the overnight market rate towards the centre of the interest rate corridor.

Floor system

In a floor system, the central bank steers the overnight rate between monetary policy counterparties towards the bottom of the corridor, which is comprised of the deposit rate. Typically, the deposit rate is at the same level as the main policy rate. The lending rate is the ceiling of the corridor and is higher than the deposit rate. The central bank uses market operations to ensure that the banking system has a liquidity surplus with regard to the central bank, i.e. the supply of central bank reserves exceeds the demand from the banking system at the current interest-rate level. This puts downward pressure on the overnight market rate against the deposit rate.

Quota system

In a quota system, the central bank sets a target level for demand and hence the supply of central bank reserves. The target level corresponds to the sum of the individually-set quotas of central bank reserves for each monetary policy counterparty. Counterparties can deposit funds with the central bank up to the level of their respective quotas at a relatively favourable interest rate, usually equal to the main policy rate. To ensure that demand does not exceed the target level, counterparties receive the lower deposit rate for central bank reserves in excess of their quota.

3 Objectives and restrictions for the Riksbank's operational framework

The main purpose of a monetary policy framework is to implement monetary policy by steering short-term market rates. In the case of the Riksbank, the aim is to stabilise short-term market interest rates close to the level of the key policy rate decided by the Executive Board of the Riksbank.⁶ Achieving good interest-rate steering where

⁵ If a central bank applies reserve requirements, counterparties are required to hold a certain, often limited, amount of reserves. However, this does not change the mechanics of how the operational frameworks function.

⁶ See Policy for the Riksbank's operational framework for the implementation of monetary policy.

short-term market rates are close to the policy rate has thus been defined as the primary objective of the Riksbank's operational framework for monetary policy.

However, the primary objective is not the only objective of the operational framework. On the contrary, when a central bank designs its operational framework, it usually takes several additional aspects into account. The nature and importance of these aspects varies between central banks. In general, however, a central bank usually has three overarching aspects or objectives to address, see Bindseil (2016). The first is the monetary policy objective, that is, the effective steering of interest rates. The second is a financial objective and includes, for example, that the central bank should not expose itself to excessive risks or distort markets. The third objective can be referred to as the general objective of the operational framework and captures other relevant aspects, such as that the framework should be efficient, automatic and transparent. These have been formulated by Bindseil (2016) to evaluate operational frameworks for monetary policy and highlight that central banks should consider a number of different factors when designing an operational framework, and that these are closely interlinked. If a central bank chooses to focus only on one or a few of the criteria, it does so at the expense of the others.

Consequently, when the Riksbank reformed its operational framework, a number of aspects were taken into account in addition to the overall monetary policy objective of achieving good interest-rate steering. The most central aspects are adequately summarised by the objectives and restrictions that the Riksbank has defined for the operational framework. They define what the Riksbank wants to achieve with its operational framework and the restrictions under which the objectives are to be met. These are the criteria against which the Riksbank evaluates its operational framework and which have guided its design. The objectives and restrictions are summarised in Table 1 below and detailed in the following three sections.

Table 1. Objectives and restrictions for the Riksbank's operational framework

Classification	Definition
<i>Primary objective</i>	Short-term market rates should be close to the Riksbank's policy rate.
<i>Secondary objectives</i>	The operational framework should be simple, clear and predictable.
	Monetary policy counterparties shall be treated equally.
	The implementation of interest-rate steering should be cost-effective.
	Operational risks should be low.
	The financial risks shall be limited.
<i>Restrictions</i>	The banking system's liquidity position with regard to the Riksbank shall not affect the operational framework's target attainment.
	The operational framework shall not have a negative impact on payments in Swedish krona.
	The operational framework shall maintain the market's incentive to manage and price risk.

Note: The objectives and restrictions of the operational framework have been expressed in slightly different ways by the Riksbank in various documents during the reform process. The above summary is taken from the consultation *The Riksbank's new operational framework for the implementation of monetary policy* from July 2019. However, it has been slightly reformulated in relation to the consultation.

Source: The Riksbank

3.1 The primary objective is purely monetary policy

The primary objective of the Riksbank's operational framework is to stabilise short-term market rates close to the policy rate. This is because it is the short-term market rates that the Riksbank is best able to steer through the operational framework, and which form the anchor for longer-term market rates.⁷ The fact that short-term rates are an anchor for longer-term rates is due to the fact that longer-term market rates are generally determined by expectations of future overnight interest rates as well as by various risk premiums, such as maturity, liquidity and credit risk premiums.⁸ An operational framework that makes it easy to predict the development of short-term market rates therefore helps to stabilise interest-rate formation also at longer maturities for a variety of financial instruments and markets.

3.2 The secondary objectives refer to other objectives of the operational framework

3.2.1 The operational framework should be simple, clear and predictable.

An operational framework is implemented by, a central bank conducting, or offering to conduct, transactions with financial market participants. For these to have an interest in interacting with the central bank, the benefits of familiarising themselves

⁷ The interest rate that the Riksbank is best able to control is the one for overnight liquidity balancing. Liquidity balancing in Swedish kronor is usually carried out at a maturity of up to one week. See Kronstedt Metz (2005) for an account of the market for liquidity balancing in Swedish kronor.

⁸ See Fransson and Tysklind (2016) for a description of the transmission from the overnight rate to other interest rates in the economy.

with the functioning of the operational framework and then using it need to outweigh the costs. A simple, automatic and clear operational framework therefore lowers the barrier for agents to interact with the Riksbank. It also makes it easier for other relevant stakeholders to understand how the Riksbank interacts with its monetary policy counterparties, and why.

A predictable operational framework also creates transparency about how the Riksbank will act in the future. This makes it easier for businesses and individuals to anticipate and act on the monetary policy trade-offs. In this way, monetary policy becomes more effective and transparent.⁹

3.2.2 Monetary policy counterparties shall be treated equally

The Riksbank is an authority under the Riksdag and therefore applies the so-called principle of equal treatment.¹⁰ This is a central principle in the Swedish legal system and means that the Riksbank may not discriminate against anyone without the support of the law. It means that the Riksbank should essentially treat its monetary policy counterparties equally.¹¹ Any departure from the principle should only be made on the basis of objective criteria and if it clearly enhances the effectiveness of the operational framework and results in better interest-rate steering.

3.2.3 The primary objective should be achieved in a cost-effective and low-risk manner

The operational framework shall not give rise to disproportionately large financial risks for the Riksbank. This is to limit potential financial losses for the Riksbank and to ensure that the Riksbank can always fulfil its tasks and commitments independently. The operational framework should also be surrounded by as few operational risks as possible to ensure that it is always implemented as intended. This creates security for both the monetary policy counterparties and the Riksbank. The operational framework must also be cost-effective to avoid wasting the Riksbank's, and ultimately society's, resources.

3.3 Restrictions on the operational framework

3.3.1 The banking system's liquidity position shall not affect objective attainment

The liquidity position of the banking system towards the Riksbank corresponds to the banking system's total claim on, or liability to, the Riksbank.¹² If the banking system as a whole has a liquidity deficit, the banking system has a liability to the central bank, which is an asset for the Riksbank. If, on the other hand, the banking system has a

⁹ See, for example, ECB (2006) for a discussion of how predictability regarding the operational framework for monetary policy and monetary policy more generally can affect its efficiency.

¹⁰ This principle is stated in section 5, second paragraph of the Administrative Procedure Act 2017:900.

¹¹ However, applying equal treatment does not preclude the Riksbank from imposing differentiated requirements on monetary policy counterparties based on objective criteria, if there are good reasons for doing so. At present, this is applied, for example, in relation to the reporting requirements for money market transactions, where the more active money market participants report their transactions on a daily basis, while the less active monetary policy counterparties report annually.

¹² See Kjellberg and Vestin (2019) for an account of the various items on the Riksbank's balance sheet and the factors that affect them.

liquidity surplus, the Riksbank instead has a liability to the banking system. The size of this balance sheet item varies over time and depends on a number of factors, both endogenous and exogenous, and is influenced, among other things, by how the Riksbank manages its other balance sheet items.¹³ The Riksbank's policy measures can also affect the balance sheet. One example of this is the purchase and sale of assets.¹⁴

Due to the fact that the liquidity position of the banking system varies over time, the Riksbank endeavours to ensure that the operational framework achieves good interest-rate steering regardless of the current liquidity position. It should work equally well when the banking system has a liquidity surplus or a liquidity deficit, and also when it is in balance. This is referred to as the universal nature of the operational framework. A universal operational framework creates flexibility for the Riksbank to be able to take appropriate measures on each occasion without jeopardising the functionality of the framework. This applies regardless of whether the Riksbank takes the policy measures for monetary policy reasons or for other reasons. This could include supporting the economy during a severe recession, switching to a self-financed gold and foreign exchange reserve, or introducing a digital central bank currency.¹⁵

3.3.2 The operational framework shall not adversely affect the payments market

According to the Sveriges Riksbank Act, in addition to its monetary policy mandate and objectives, the Riksbank shall contribute to an efficient and stable financial system, which includes the ability of the general public to make payments. It is therefore natural that the Riksbank's tools for achieving the monetary policy objective should not prevent the Riksbank from fulfilling its other tasks. The operational framework should therefore be designed in a way that allows it to function despite, and without impeding, the development of the payments market.

3.3.3 The operational framework shall maintain the market's incentive to price risk

It is important for the Riksbank to be able to control market interest rates to influence the economy and ultimately inflation. At the same time, it is appropriate that the Riksbank does not influence the markets more than necessary, i.e. that the Riksbank does not contribute to crowding out certain market segments or significantly

¹³ Endogenous refers to influences that arise as a result of the Riksbank's decisions, while exogenous influences arise as a result of factors outside the Riksbank's control. The Riksbank can predict and influence endogenous factors to some extent. Examples of endogenous factors are how the Riksbank should finance dividends to the government and when they should be paid, or how large the gold and foreign exchange reserves should be. Exogenous factors are beyond the Riksbank's control. One example is the amount of banknotes and coins in circulation, which is determined by public demand.

¹⁴ The Riksbank's transactions in securities for monetary policy reasons are an example of policy measures that have affected the liquidity position of the banking system towards the Riksbank. The purchases of securities were financed by an increase in monetary policy debt, which increased the liquidity surplus in the banking system. The Riksbank is currently liquidating its securities holdings through maturities and sales, which is contributing to a further reduction in the liquidity surplus.

¹⁵ All of these measures affect the liquidity position of the banking system towards the Riksbank. The conditions for implementing these and similar measures would therefore be different if the Riksbank's operational framework did not have this restriction.

changing the dynamics of the markets. Maintaining, or at least not undermining, the incentives for financial markets to price risk is one way to ensure this.

4 The design of the Riksbank's operational framework

In this section we describe the design of the Riksbank's operational framework and the main reasons for this design. The section is divided into three parts: 4.1 describes the instruments of the operational framework, 4.2 the collateral requirements that the Riksbank applies to the operational framework and 4.3 the Riksbank's set of counterparties in the operational framework.

4.1 The instruments of the monetary policy operational framework

The instruments in the Riksbank's monetary policy operational framework consist of deposit and lending opportunities in the Riksbank. The instruments can be divided into two categories: standing facilities and open market operations. **Standing facilities** control the marginal cost of overnight liquidity, i.e. the cost of the last krona borrowed or invested by counterparties. They thus set the outer boundaries for the Riksbank's interest rate corridor and for the overnight rate between the monetary policy counterparties. **Market operations** are various forms of transactions that temporarily affect the liquidity position of the banking system towards the Riksbank. They aim to stabilise the overnight rate in the middle of the corridor, close to the policy rate. They are also an important tool for clearly signalling the level of the policy rate.

4.1.1 The design of the operational framework instruments

The Riksbank has **standing facilities** for both deposits and loans. What they have in common is that they have an overnight maturity and that monetary policy counterparties can always use them on their own initiative.¹⁶ See Figure 2 below for an illustration of the standing facilities.

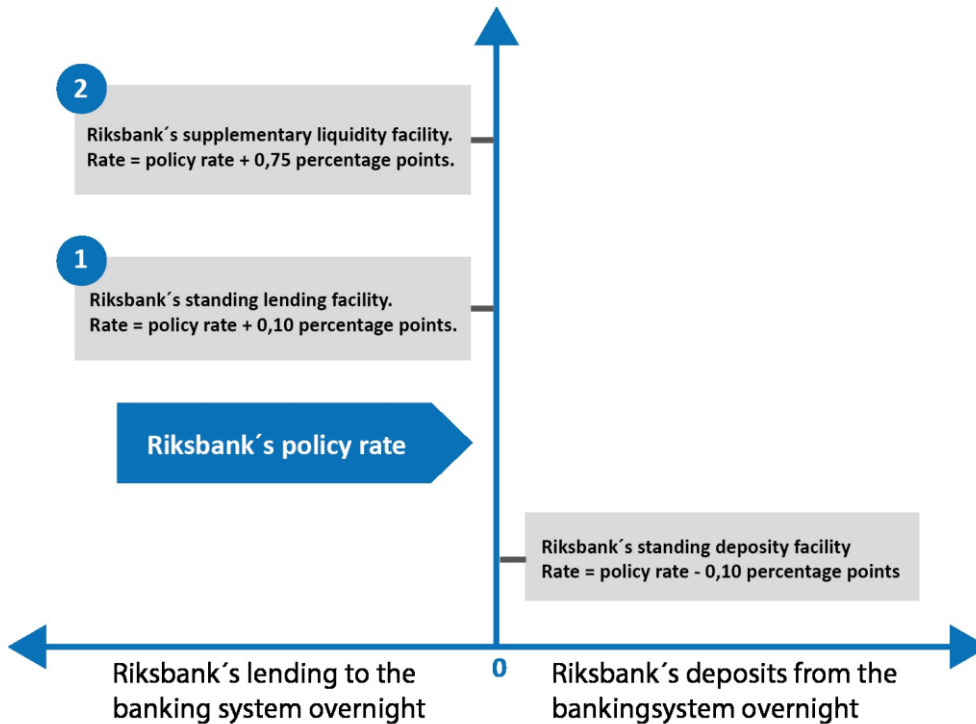
If a monetary policy counterparty has a surplus of liquidity at the end of the day, they can place it in the Riksbank's standing deposit facility overnight. There is no upper limit to the amount that counterparties may invest in the standing deposit facility and the interest rate they receive, the deposit rate, is equal to the policy rate minus 10 basis points.¹⁷ If a counterparty instead has a deficit at the end of the day, they are primarily given the opportunity to borrow via the Riksbank's standing lending facility. Under the facility, they may borrow an unlimited volume in exchange for pledging sufficient primary collateral (see Section 4.2.1) to the Riksbank. The interest rate they pay, the lending rate, corresponds to the policy rate in force at the time, plus 10 basis

¹⁶ In formal terms, credit and deposits under the standing facilities run from the change of value day in RIX until RIX-RTGS opens for liquidity transfers on the following value day. The time for this is normally 18.00-19.00.

¹⁷ A basis point is one hundredth of a percentage point and is a term commonly used in financial contexts. Thus, 10 basis points are equivalent to 0.10 percentage points.

points. The interest rates on these two facilities create a corridor 20 basis points wide that sets the limits of the interest rates in the overnight market (see Section 2).

Figure 2. Standing facilities in the Riksbank's operational framework



Note: The boxes with numbers refer to the collateral pools required for use of the respective credit facilities: primary (Box 1) and secondary (Box 2) collateral pool.

Source: The Riksbank

If a monetary policy counterparty does not have sufficient primary collateral to cover its borrowing needs under the standing lending facility, it can borrow the excess volume under the supplementary liquidity facility. This is because the facility allows counterparties to borrow against a wider range of collateral (secondary collateral pool, see Section 4.2.1), but at a higher interest rate. The liquidity facility rate corresponds to the policy rate plus 75 basis points.

In contrast to standing facilities, the Riksbank offers **market operations** only on specific occasions determined by the Riksbank, usually once a week, and in limited volume.¹⁸ Whether the Riksbank offers counterparties the opportunity to invest or borrow liquidity in market operations depends on whether the banking system as a whole has a surplus or deficit of liquidity towards the Riksbank.

When the banking system has a liquidity surplus, the Riksbank offers counterparties an investment opportunity, i.e. the Riksbank drains the banking system of liquidity. This is done by the Riksbank offering to issue Riksbank Certificates. Riksbank

¹⁸ As a result of market operations being offered in a limited volume, they are offered through an auction proceedings, where counterparties bid for their desired volume. If the auctions are oversubscribed, the Riksbank applies a pro rata allocation in the auctions.

Certificates are issued at an interest rate corresponding to the current policy rate and usually have a maturity of one week. Riksbank Certificates, which are a type of security, can also be traded on the secondary market. It is also possible for counterparties to sell Riksbank Certificates back to the Riksbank before they mature.

As the Swedish banking system has had a liquidity surplus towards the Riksbank since 2008, the main market operations since then have comprised the issuance of Riksbank Certificates. If, on the other hand, the banking system had a liquidity deficit towards the Riksbank, the Riksbank would offer counterparties lending in market operations, i.e. inject liquidity into the banking system. It would then be implemented either by the Riksbank offering monetary policy repos or loans. Both would be conducted with a one-week maturity, at the current policy rate and against the primary collateral pool, see Section 4.2.

Regardless of whether the Riksbank uses market operations to inject liquidity into the banking system or drain liquidity from it, market operations are offered in a limited volume, usually corresponding to the current liquidity position of the banking system towards the Riksbank.¹⁹ When the counterparties' total demand to invest or borrow liquidity corresponds to the volume offered by the Riksbank, the system is balanced close to zero for the duration of the market operation. This means that the overnight rate between monetary policy counterparties stabilises close to the policy rate. However, it is common that counterparties choose to hold a smaller liquidity buffer, and thus do not demand the full volume offered. They do so to be able to independently manage variations and surprises in their projected payment inflows and outflows over the life of the open market operation.

By limiting the volume offered in market operations, the Riksbank reduces the risk of the banking system's liquidity position towards the Riksbank changing sign during the term of the market operations, i.e. that the banking system as a whole goes from a surplus to a deficit or vice versa. This means that counterparties quickly move from needing to deposit money, to borrowing money, or vice versa, and it is desirable to avoid this as it risks causing unnecessary volatility in the overnight market.

The purpose and key features of the instruments are summarised in Table 2 below and the subsequent sections explain the rationale behind their design in more detail.

¹⁹ On a number of occasions and for longer periods, the Riksbank has deviated from this principle and offered a smaller issue volume than the banking system's overall liquidity position towards the Riksbank. This is to prevent disturbances in interest-rate formation in special circumstances. See footnote 37 for more information on when and why the Riksbank last applied deviations from the principle.

Table 2. The Riksbank's instruments in the operational framework

Instrument	Purpose	Key characteristics
Standing deposit facility	Used to manage temporary liquidity surpluses at the end of the day and to provide the floor for interest-rate formation in the overnight market.	<ul style="list-style-type: none"> - Deposits - At the request of counterparties - Overnight maturity - The deposit rate
Standing lending facility	Used to manage temporary liquidity deficits at the end of the day and to provide a ceiling for interest-rate formation in the overnight market.	<ul style="list-style-type: none"> - Secured lending - At the request of counterparties - Overnight maturity - Lending rate - Primary collateral pool
Supplementary liquidity facility	Used as a backstop and to manage temporary end-of-day liquidity deficits in cases where counterparties do not have sufficient primary collateral.	<ul style="list-style-type: none"> - Secured lending - At the request of counterparties - Overnight maturity - Liquidity facility rate - Secondary collateral pool
Issuance of Riksbank Certificates	Used to balance the system when the banking system has a structural liquidity surplus towards the Riksbank.	<ul style="list-style-type: none"> - Deposits - The Riksbank controls supply - Maturity of one week - Policy rate
Monetary policy repos/ lending at longer maturities	Used to balance the system when the banking system has a structural liquidity deficit towards the Riksbank.	<ul style="list-style-type: none"> - Secured lending - The Riksbank controls supply - Maturity of one week - Policy rate - Primary collateral volume

Source: The Riksbank

4.1.2 Reasons for the design of the instruments

The corridor system is universal and flexible

As we wrote in Section 2, there are three dominant categories of operational framework, of which the Riksbank applies a corridor system. In the Riksbank's assessment, this category of operational framework best fulfils the objectives and restrictions that the Riksbank has defined for its framework.

A corridor system can work well regardless of the liquidity position of the banking system towards the central bank. This is in contrast to floor and quota systems that require the banking system to have excess liquidity. The corridor system is therefore universal, which has several important advantages. For example, it creates flexibility for the Riksbank to take appropriate policy measures without jeopardising the functionality of the operational framework. This is important because policy measures often affect the Riksbank's balance sheet, see Section 3.3.1. The fact that the operational framework is universal also creates the conditions for a robust operational framework that lasts over time. For example, it is an open question how digital central bank currencies and other innovations in the payment market or the financial system in general may affect the liquidity position of the banking system in relation to the Riksbank in the future.

As the corridor system does not require the Riksbank to maintain a liquidity surplus, and thus the Riksbank to have a large balance sheet, the corridor system is also associated with smaller financial risks than the other two main types of operational

framework. For example, this reduces the risk of the Riksbank incurring large financial losses due to fluctuations in the value of assets held on the balance sheet to maintain the liquidity surplus. There is also a risk that a banking system that is in a permanent liquidity surplus will demand more and more liquidity, requiring the central bank's balance sheet to continue to grow.²⁰ This risk is reduced for the Riksbank, which signals through the corridor system that the Riksbank does not intend to permanently maintain a situation where the banking system has a liquidity surplus.

A corridor system may also create incentives for counterparties to seek market solutions for their daily liquidity balancing in the first instance, and turn to the central bank in the second instance, see Section 2.2. This means that by applying a corridor system, the Riksbank can improve the incentives for an active money market.

A narrow corridor limits volatility in the overnight rate

The Riksbank applies a narrow symmetrical interest rate corridor of 20 basis points. The fact that the corridor is symmetric, rather than asymmetric, gives a clear signal about the policy rate. Indeed, if the overnight liquidity position of the banking system is balanced, the expected value of the overnight rate between monetary policy counterparties will be equal to the policy rate.

In a corridor system, the width of the corridor is a trade-off between, on the one hand, incentivising counterparties to seek market solutions for their liquidity management, and, on the other hand, limiting the volatility of the overnight rate.²¹ With a wide corridor, counterparties will have stronger incentives to use market solutions for their liquidity management, as it will be more expensive to turn to the central bank. At the same time, it means that fluctuations in the overnight rate, which are usually restricted by the level of central bank deposit and lending rates, can be large. According to the same reasoning, the incentive to seek market solutions decreases when the corridor is narrowed. As do fluctuations in the overnight interest rate. At the same time, it should be recognised that interbank activity in Sweden, as in several other countries, has declined significantly since the global financial crisis.

The Riksbank considers that the two motives are well balanced when the corridor is 20 basis points wide. Such a corridor width should provide counterparties with an incentive for some activity in the interbank market, especially since the Riksbank offers credit in the standing lending facility only against high-quality collateral, see Section 4.2. At the same time, it should ensure that the opportunity cost of borrowing or investing with the Riksbank is not too high and that the overnight rate between monetary policy counterparties does not fluctuate by more than 20 basis points in one day. This creates good conditions for predictable interest-rate formation.

From an interest-rate steering perspective, it does not matter to the Riksbank whether the monetary policy counterparties borrow cash in the lending facility or whether they place funds in the deposit facility, see Section 2. However, for various

²⁰ See for example Acharya et al. (2022) for a discussion of the drivers of this phenomenon.

²¹ See, for example, Bindseil and Jablecki (2011) for an empirical study on how corridor width affects volatility in overnight rates and how counterparties choose to balance their liquidity.

reasons, there is usually a stigma attached to borrowing from the central bank. A narrow corridor where the Riksbank lends against high quality collateral should be able to reduce this stigma and lessen the reluctance of monetary policy counterparties to utilise the lending facilities when necessary.

Two lending facilities enable a narrower interest rate corridor and strengthen the incentives to use high-quality collateral

As shown above, there are clear advantages to applying a narrow, symmetrical corridor. However, such a corridor assumes that the lending rate does not differ significantly from the policy rate, which is a relatively generous pricing. To justify this generous pricing, the Riksbank considers that a counterparty should pledge high-quality collateral. At the same time, it is important for the Riksbank not to reduce the counterparties' overall ability to exchange collateral for liquidity if necessary. Therefore, the Riksbank offers two lending facilities with different collateral requirements and interest rates.

The Riksbank applies a greater difference in the facilities' lending rates than the corresponding difference for borrowing in the repo market against the two different types of collateral. This is partly to strengthen the counterparties' incentives to seek market solutions for their liquidity balancing, and partly to create an incentive to primarily use government securities and central bank claims (primary collateral pool) as collateral for credit from the Riksbank, and secondarily to use somewhat riskier, but still adequate, collateral (secondary collateral pool). It also reduces the credit risk the Riksbank is exposed to. It can also be seen as the Riksbank mainly steering the interest rate on loans against the most safe assets, and the market itself setting the relative price against other assets.

4.2 The collateral in the monetary policy operational framework

The Riksbank only provides credit to monetary policy counterparties against adequate collateral. This is an obligation arising from the Sveriges Riksbank Act. Moreover, it is a way for the Riksbank to limit its credit risks, thereby protecting its capital. The collateral framework governs which securities and currencies the Riksbank accepts as collateral and how they are valued. In addition, the framework is a tool that the Riksbank can use to control counterparties' costs and incentives for borrowing from the Riksbank.

The fact that the Riksbank only provides credit against collateral means that it is not necessary to apply different interest rates for different counterparties depending on their creditworthiness. The fact that the Riksbank applies one framework for all counterparties means that the counterparties are treated equally. It also simplifies the operational framework, which contributes to clear and transparent monetary policy signalling.

4.2.1 Requirements imposed by the Riksbank regarding collateral

The Riksbank accepts collateral that is mainly comprised of various types of Swedish or foreign securities with high creditworthiness. Collateral in the form of foreign exchange is also accepted to some extent.

For a security to be accepted as collateral, it needs to fulfil a number of eligibility requirements. Among other things, it needs to have a high credit rating, a certain outstanding volume, be issued by an authorised party domiciled in a country approved by the Riksbank, be listed on a regulated market, be registered according to special rules and be issued in a currency approved by the Riksbank.²²

The collateral pledged by the monetary policy counterparties to the Riksbank is valued daily. The current market value forms the basis for the Riksbank's valuation but, in order for the collateral to be considered adequate, haircuts are also made for the securities' liquidity, maturity and currency risk.²³ This adjusted value then forms the basis for how much a monetary policy counterparty can borrow from the Riksbank (see Section 4.1).

If the collateral pledged consists to a large degree of a single asset type, the Riksbank faces a concentration risk. To reduce it, the Riksbank also applies conditions that regulate the composition of the collateral pledged by monetary policy counterparties. These conditions mean that there are limits on the proportion of the collateral pledged that can be covered bonds and the proportion that can be issued by the same issuer or several issuers closely linked to each other.

These conditions form the basis for which collateral the Riksbank can accept for loans and how this is valued. In addition, the Riksbank divides the collateral into two collateral pools, one primary and one secondary. This is a consequence of the design of the lending facilities (see section 4.1.1). The counterparty can use the primary collateral pool for loans under the standing lending facility and the secondary collateral pool for loans under the supplementary liquidity facility. Both collateral pools are accepted for intraday credit in the Riksbank's RIX payment system.

The primary collateral pool consists of:

- i. securities issued by a government
- ii. securities issued by a central bank
- iii. other claims on a central bank.

The secondary collateral pool is comprised of other assets accepted by the Riksbank. These are:

- i. securities issued by international organisations
- ii. securities guaranteed by a government

²² See Terms and Conditions for RIX and Monetary Policy Instruments, Annex H4 Collateral Instructions, for a detailed account of the requirements for securities to be accepted as collateral. The requirement that the collateral be listed on a regulated market does not apply to Riksbank Certificates.

²³ See Terms and Conditions for RIX and Monetary Policy Instruments, Annex H4 Collateral Instructions, for a detailed account of the haircuts applied by the Riksbank.

- iii. covered securities
- iv. securities issued by agencies²⁴
- v. other securities that comply with the Riksbank's conditions.

4.2.2 Reasons for the requirements set by the Riksbank for collateral

Several types of collateral are accepted so that counterparties can always borrow when necessary

The Riksbank accepts a number of currencies, securities and claims as collateral to ensure that monetary policy counterparties can borrow from the Riksbank if they need to. In general, the Riksbank accepts debt instruments from countries that the Riksbank deems to have comparable protection for investors as Sweden.

The collateral the Riksbank accepts for lending in the operational framework for monetary policy also corresponds to the collateral the Riksbank accepts for intraday credit in the RIX payment system.²⁵ The Riksbank thus ensures that a situation does not arise in which the monetary policy counterparties can borrow during the day but cannot roll the credit overnight.

The basis for the haircut is the same for all types of collateral

The Riksbank applies different interest rates for lending against primary and secondary collateral volumes. This distinction is clear in that the Riksbank has two separate lending facilities, the standing lending facility and the supplementary liquidity facility. The main reason the Riksbank differentiates between the collateral pools in this way, by applying different interest rates and not by using different haircuts for the different collateral volumes, is that this does not make it more expensive for counterparties to use secondary collateral for intraday credit. It also simplifies and clarifies the framework for collateral.

See Section 4.1.2 for an explanation of why the Riksbank differentiates between lending against primary and secondary collateral volumes.

4.3 Counterparties in the monetary policy framework

The monetary policy counterparties are the only agents who have access to the Riksbank's standing facilities and market operations. This means that it is these agents that enable the Riksbank to be active in financial markets. The Sveriges Riksbank Act limits the Riksbank's possible set of counterparties to financial companies. In addition, the Riksbank has formulated a number of criteria an agent must fulfil to qualify as a counterparty to the Riksbank. These are designed in such a way that the Riksbank's

²⁴ Agencies refers to certain entities with federal or state guarantees, such as the US Federal Home Loan Mortgage Corporation ("Freddie Mac") and the Federal National Mortgage Association ("Fannie Mae"), the European Financial Stability Facility (EFSF) and the German Kreditanstalt für Wiederaufbau (KfW). See Appendix 2 to Annex H4 of the Terms and Conditions for RIX and Monetary Policy Instruments for the full list.

²⁵ Interest-free intraday credit in the RIX payment system is provided against both the primary and the secondary collateral pool.

set of counterparties primarily reflects the types of agent that are important for the transmission of monetary policy in Sweden.

The Riksbank did not review the set of monetary policy counterparties when the operational framework was reformed between 2019 and 2022. In the next section, we therefore describe how the design of the set of counterparties has been justified historically.

4.3.1 The Riksbank's set of monetary policy counterparties

The instruments in the Riksbank's operational framework are designed to facilitate short-term liquidity management in Swedish kronor and to influence its price (see Section 2). Consequently, the monetary policy counterparties need to consist of agents who need to participate in this liquidity balancing and who set the tone for interest-rate formation in the short-term money market. Counterparties also need to influence other interest-rate formation in the economy to ensure a well-functioning transmission from the operational framework to the real economy.

For the Riksbank to avoid exposing itself to unnecessarily large financial or operational risks, and for the operational framework for monetary policy to be cost-effective, it is also appropriate that the set of counterparties is not too large.

In light of this, the Riksbank has considered that the set of monetary policy counterparties should consist of participants who are credit institutions with a domicile or branch in Sweden and who are participants in the Riksbank's payment system, RIX. Agents that fulfil these criteria can apply to be a monetary policy counterparty.²⁶ In the following section we explain the reasons behind this design in more detail.

4.3.2 Reasons for the Riksbank's design of the set of monetary policy counterparties

Monetary policy counterparties must be domiciled or have a branch in Sweden.

The Riksbank's operational framework aims to influence interest-rate formation in Swedish kronor and ultimately affect the Swedish economy. The Riksbank therefore needs to have monetary policy counterparties that are active in Swedish financial markets.

Requiring counterparties to be domiciled or have a branch in Sweden is a way of limiting the set of counterparties to those agents that have links to the Swedish financial sector and can thus be considered relevant to the Riksbank's objectives, i.e. to conduct monetary policy in Swedish kronor.

Monetary policy counterparties shall be credit institutions

²⁶ In addition, monetary policy counterparties must fulfil a number of additional requirements, specified in the Terms and Conditions for RIX and Monetary Policy Instruments.

The Swedish economy, or rather its financing, is largely bank-based.²⁷ The larger banks in Sweden are also universal banks and have a dominant role as intermediaries in the Swedish capital markets. This means that banks are the agents that influence the financing conditions for most operators in Sweden. As payment intermediaries, the banks have also traditionally needed to manage temporary liquidity surpluses and deficits. By controlling the banks' cost of managing their liquidity, the Riksbank can thus influence interest rates for a wide range of participants.

Monetary policy counterparties shall be participants in RIX

For a monetary policy counterparty to be able to utilise standing facilities in practice, it must have access to an account in the Riksbank's central payment system, RIX. As a result, the Riksbank requires monetary policy counterparties to have their own account in RIX and not to act through a correspondent bank. The background to this requirement is that the Riksbank wishes to maintain a high degree of automation in monetary policy transactions, that should not require active input from the counterparty, and to reduce operational risks.

5 Objective attainment of the operational framework

In the previous section, we described the different elements of the operational framework, how they are organised and why. In this section, we take a step back and look at the big picture. We report on how well the operational framework achieves its primary objective of stabilising short-term market interest rates close to the policy rate. Our conclusion, which we develop in sections 5.2 and 5.3, is that target fulfilment has been good as the Riksbank has succeeded in stabilising them close to the policy rate. Section 5.1 presents the starting points for our analysis.

5.1 The starting points for the analysis

The Riksbank has the greatest opportunity to control the interest rate faced by monetary policy counterparties for liquidity balancing overnight. To evaluate the effectiveness of the operational framework in achieving the primary objective, it is therefore appropriate to first examine the level of that interest rate. As a second step, it is appropriate to examine the interest rate faced by a wider range of participants for the equivalent unsecured transactions (*unsecured overnight loans*). The interest rate that these participants encounter can be said to constitute the first step in the transmission of the Riksbank's policy rate through the operational framework to the economy.

At the same time, the primary objective is not limited to only one interest rate or one maturity. This means that we need to examine more market rates to evaluate how well the operational framework fulfils the objective. The two most obvious markets are the repo market and the FX swap market.²⁸ These are two markets that are

²⁷ Note that credit institutions include more agents than just banks, but that credit institutions and banks are used synonymously for simplicity.

²⁸ See Kronstedt Metz (2005) for a description of the markets and instruments used for liquidity balancing in Swedish kronor.

extremely important for short-term liquidity balancing in Swedish kronor. In relation to the unsecured overnight market, they have also grown in importance over the past decade. In the **FX swap market**, participants can obtain short-term liquidity in kronor by temporarily surrendering liquidity in foreign currency. In the **repo market**, participants exchange cash for collateral.²⁹

The FX swap market is important for Swedish agents' short-term liquidity management. But it is affected by a large number of factors beyond the Riksbank's operational framework for monetary policy. For example, the pricing of FX swaps depends on current and expected interest rates in both Swedish kronor and the foreign currency in question. Because of this, and the fact that in this article we focus on how well the operational framework works for the target for interest-rate formation in Swedish kronor, we only discuss interest-rate formation on the unsecured overnight market and the repo market in the following sections.

Information on interest-rate formation is based on the data the Riksbank collects from monetary policy counterparties on their transactions in the shortest part of the Swedish money market.^{30, 31} These data are regularly used by the Riksbank to evaluate the implementation of the Riksbank's monetary policy. In addition, a subset of these data is used to determine the transaction-based reference rate SWESTR.

5.2 The unsecured overnight market³²

We define the interest rate that monetary policy counterparties face for their overnight liquidity balancing as a volume-weighted average of the interest rates on the transactions that the counterparties carry out with the Riksbank and with other monetary policy counterparties. In Figure 3 below we show how this interest rate has evolved from mid-2021 to mid-2023. As shown in the figure, the Riksbank has raised the policy rate from 0.00 per cent to 3.50 per cent over the period.³³ It can also be noted that during the same period the Riksbank went from buying debt securities on the secondary market to selling them.³⁴ However, the banking system has had a significant liquidity surplus towards the Riksbank throughout the observed period, around SEK 1,000 billion or more, see Figure 4.³⁵

It is clear from Figure 3 that the interest rate for monetary policy counterparties' liquidity balancing has a good correlation with the Riksbank's policy rate. Over the

²⁹ It can be argued that the Swedish repo market is now mainly used to obtain securities that participants want to borrow for various reasons, especially in the case of repos against government bonds. However, the repo market remains a way for participants to manage their liquidity in the market by posting collateral.

³⁰ In accordance with the Terms and Conditions for RIX and monetary policy instruments, the Riksbank requests data on executed transactions between monetary policy counterparties and between monetary policy counterparties and a wider circle of participants. It is transactions with a maturity of up to and including ten days that must be reported to the Riksbank.

³¹ In our analysis, we also use data on the use of the Riksbank's standing facilities and market operations.

³² An overnight loan is an unsecured overnight transaction in which one party lends cash to the other.

³³ The Riksbank's decision on 28 June 2023 to raise the policy rate to 3.75% was applied from 5 July 2023.

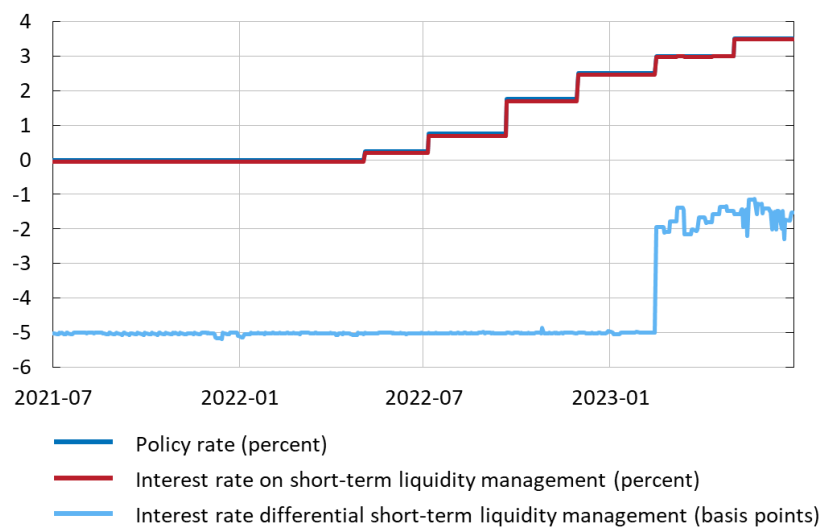
³⁴ The Riksbank stopped buying securities in December 2022 and started selling securities in April 2023.

³⁵ The liquidity surplus is partly due to the Riksbank buying Swedish securities from 2015 onwards between 2012 and 2022 for monetary policy purposes, and partly due to the Riksbank selling Swedish kronor and buying US dollars and euros between February 2021 and December 2022 to self-finance the foreign exchange reserve.

period shown in the figure, the combined liquidity balancing rate of the monetary policy counterparties has been between 1 and 5 basis points below the policy rate.³⁶ Thus, the interest rate has remained stable close to the policy rate and within the interest rate corridor of the operational framework. This stable deviation from the policy rate indicates that the operational framework works well in both a low and a high interest rate environment.

Figure 3. Interest on short-term liquidity management

Per cent and basis points respectively



Note: The series Interest rate on short-term liquidity management corresponds to a volume-weighted average of the interest rates on the transactions that monetary policy counterparties make with the Riksbank and with other monetary policy counterparties (overnight maturity, unsecured).

Source: The Riksbank

The fluctuations in the interest rate can largely be explained by the fact that during the period it has varied how much of the liquidity surplus the monetary policy counterparties have chosen, and been able, to invest in Riksbank Certificates.³⁷ It is also a change in this volume that causes the interest rate to stabilise closer to the policy rate from mid-February 2023. From this point onwards, the Riksbank offers a larger issue volume of Riksbank Certificates.³⁸

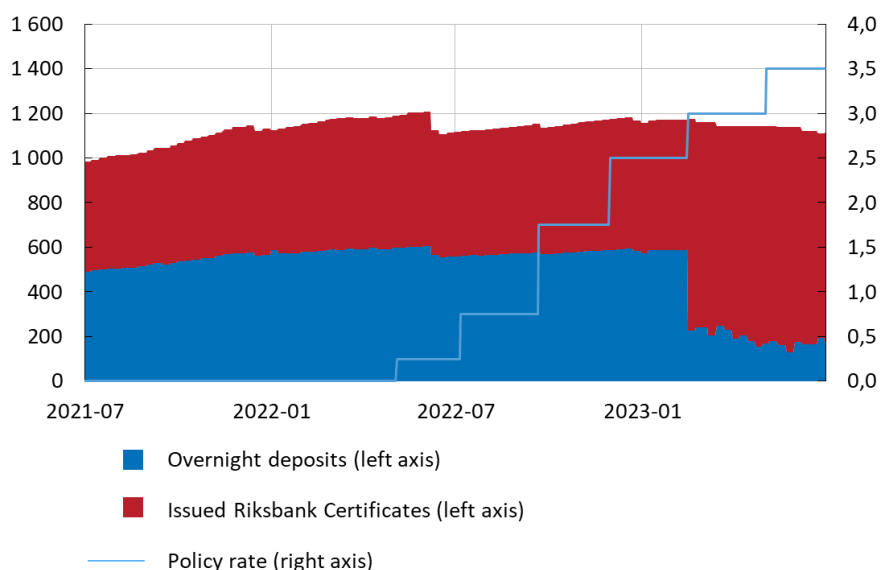
³⁶ The average over the period is a deviation of 4 basis points.

³⁷ In relation to the normally applied principle of offering an issue volume corresponding to the banking system's entire liquidity surplus, the Riksbank applied limitations on the issue volume offered between October 2019 and February 2023. The restrictions were applied to ensure that a sufficient amount of liquidity was available overnight to prevent disruptions in interest-rate formation during the reform of the operational framework and during the coronavirus pandemic. From May 2021 until February 2023, the offered issue volume was limited to half of the banking system's current liquidity surplus towards the Riksbank. The Riksbank then switched to offering an issue volume corresponding to the banking system's entire liquidity surplus towards the Riksbank. However, during a transitional period of three months (14 February to 19 May), the volume was limited by SEK 20 billion.

³⁸ The Riksbank increased the offered issue volume of Riksbank Certificates on 14 February 2023 (see footnote 37). As a result, counterparties have started to place a larger volume in Riksbank Certificates at the policy rate and thus a smaller volume in the standing deposit facility at an interest rate 10 basis points

When we study how well the operational framework fulfils the primary objective, the next stage of interest-rate formation is also of interest, namely the unsecured overnight rate faced by a wider range of agents. We can study this through the SWESTR reference rate. SWESTR is a volume-weighted transaction-based rate based on the actual interest rate faced by banks, financial corporations and non-financial corporations for overnight unsecured deposits with monetary policy counterparties. SWESTR is illustrated in Figure 5 below.

Figure 4. The liquidity position of the banking system and the Riksbank's policy rate
SEK billion and per cent



Source: The Riksbank

Figure 5 shows that SWESTR is stable and close to the Riksbank's policy rate. SWESTR follows changes in the policy rate and tends to be on average 11 basis points below it.^{39,40} The fact that SWESTR is so responsive indicates good target fulfilment and that the monetary policy transmission works well in a first stage beyond the Riksbank's monetary policy counterparties. It is expected that the interest rate is on average just

below the policy rate. This pushes up the volume-weighted interest rate for overnight liquidity balancing by monetary policy counterparties.

³⁹ SWESTR started being made available for actual use as a reference rate on 1 September 2021. Before that, the historical estimates published by the Riksbank for SWESTR have been used in the calculations.

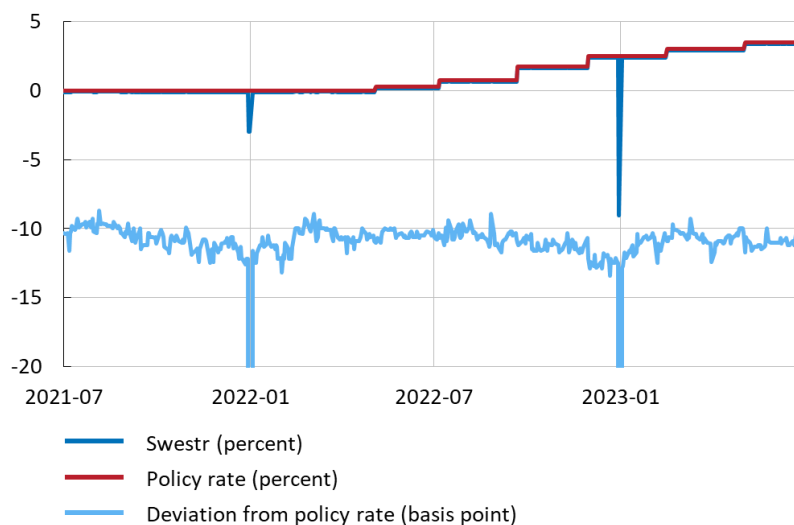
⁴⁰ This average deviation refers to the difference between SWESTR and the policy rate on all days of the year, except for the last business day of the year when SWESTR usually falls very sharply. The phenomenon of banks reducing the interest rates offered to their customers for deposits on the last banking day of the year stems from the fact that banks pay a bank tax and a resolution fee, which, expressed in a simplified way, are based on their balance sheet total at the end of the year. This implies that banks have an incentive to minimise their balance sheet total on the day in question, and that the banks therefore reduce their deposit rates to very unfavourable levels to make it unattractive for customers to deposit money with them or to compensate for the additional regulatory costs of the transactions. However, in terms of objective attainment and monetary policy implementation, the year-end effect is a negligible problem. Although the shortest money market rates deviate significantly from the policy rate on one day of the year, this is only one day per year and the deviation occurs for well-documented reasons.

below the Riksbank's deposit rate, i.e. the policy rate with a deduction of 10 basis points, as monetary policy counterparties usually price the deposits they receive on the basis of the interest rate they would receive if they invested liquidity in the Riksbank. As monetary policy counterparties can always place liquidity in the standing deposit facility, the interest rate on this provides a reference for their own pricing.

All in all, Figure 3 and Figure 5 show that the Riksbank has succeeded in stabilising overnight rates close to the policy rate for both its monetary policy counterparties and a wider range of economic agents during the period examined.

Figure 5. SWESTR

Percentage points and basis points respectively



Note: On 30 December 2021, SWESTR was -2.970 per cent. The policy rate at that time was 0.00%. On 30 December 2022, SWESTR was -9.038 per cent. The policy rate at that time was 2.50 per cent. SWESTR started being 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 in the calculations.

Source: The Riksbank

5.3 Repo market⁴¹

In the repo market, agents exchange cash for collateral. In recent years, this market has grown larger than the unsecured market in terms of liquidity balancing at slightly longer, but still short maturities, such as one week. This is true both in terms of the number of transactions carried out and the total volume of transactions, and both for transactions between monetary policy counterparties and the transactions monetary policy counterparties carry out with a wider range of participants. Against this

⁴¹ A repo is a collateralised transaction in which one party lends cash to the other in exchange for collateral in the form of a bond.

background, it is relevant to also study interest-rate formation in the repo market in order to evaluate the operational framework.

The increased use of the repo market for short-term liquidity management is a trend that can also be observed in other economies. It has therefore also become increasingly common for central banks, in addition to targeting overnight rates, to focus on targeting and stabilising repo rates with government securities as underlying collateral, often with the help of additional instruments in the form of repo facilities.⁴² The fact that the Riksbank, after the reform of the operational framework for monetary policy, differentiates between setting interest rates on credit against government securities (primary collateral volume) on the one hand, and against more risky bonds (secondary collateral volume) on the other, could also be interpreted as the Riksbank having taken a small step in this direction, i.e. towards controlling the cost of procuring liquidity against government bonds in the repo market. This is because the Riksbank now differentiates its lending in a way that mimics the segmentation of the repo market. The pricing of the Riksbank's various facilities can thus be compared more directly with the cost of borrowing against equivalent collateral on the repo market.

Based on the data that the Riksbank collects on completed repo transactions, we can make a number of observations. The most common forms of repo transaction are transactions with Swedish government bonds or covered bonds as underlying collateral. The most common maturities are one day or one week, and in both cases with one-day settlement.⁴³ The interest rates at which these types of operations are conducted also closely follow the policy rate. This indicates that interest-rate steering is working well.

If we study interest-rate formation in more detail, we can also see that interest rates in repo transactions with covered bonds as underlying collateral are stable and close to the policy rate. Interest rates for repo transactions with government bonds as underlying collateral are also at a stable level, but deviate relatively much from the policy rate. However, it is likely that repo transactions with government bonds as underlying collateral are also affected by the interest rate on the Swedish National Debt Office's market-supporting repo facilities, which are priced outside the interest rate corridor of the operational framework.⁴⁴

6 The Riksbank's operational framework in an international context

The Riksbank's operational framework shares several features with those of other central banks. At the same time, it also differs in several significant ways.

⁴² See, for example, Hansson and Wallin Johansson (2023) for an account of how fourteen central banks' operational frameworks are designed.

⁴³ That is, tomorrow-next (T/N) and tomorrow-week (T/W).

⁴⁴ See Blix Grimaldi and Hirvonen (2023) for more information on the Swedish National Debt Office's market-making repo facilities and how their utilisation has varied over time.

The vast majority of central banks apply one of the three types of operational framework described in the fact box in Section 2, i.e. corridor, floor or quota systems. These three types of operational frameworks differ at a conceptual level. This means that the Riksbank's operational framework is generally more similar to other corridor systems than the operational frameworks of central banks that apply quota or floor systems. However, the different types can be implemented in a variety of ways. There may therefore be significant differences even among central banks that apply the same type of operational framework. It is often considerations corresponding to the restrictions and secondary objectives the Riksbank has formulated for its operational framework (see Section 3) that determine the type of operational framework a central bank chooses. However, the differences in the actual implementation, i.e. the design of the policy instruments, set of counterparties and collateral requirements, depend to a large extent on differences in primary objectives, mandates and local conditions.

While the operational frameworks differ, there are also many similarities between them. For example, the vast majority of central banks have credit institutions as monetary policy counterparties, offer some type of standing deposit and lending facility with overnight maturity, and offer regular longer-term market operations to provide or drain liquidity from the banking system (Hansson and Wallin Johansson, 2023). These similarities are also a natural consequence of the fact that the overall purpose of central banks' operational frameworks is ultimately the same, i.e. to stabilise short-term market interest rates.

A further factor contributing to the significant similarities between central bank operational frameworks, and in particular similarities in how these frameworks evolve over time, is that central banks often face similar challenges and changes in their environment. These changes and challenges stem to a large extent from developments in payment and financial markets, and because they are often global phenomena, central banks face similar issues. Consequently, when central banks choose to deal with them in a similar way, as is common, it creates trends in the evolution of operational frameworks over time. To the extent that central banks handle them differently, they also illustrate important differences between central banks.

To clearly illustrate how the Riksbank's operational framework relates to other central banks' operational frameworks, and how they have developed over the past decade or so, we shed light on three such trends in the following section.

6.1 Many central banks have switched from corridor systems to floor systems

Since the global financial crisis, many central banks have moved from a corridor system to a floor system.⁴⁵ Examples include the European Central Bank, the Federal Reserve, the Bank of England, the Reserve Bank of New Zealand and the Reserve Bank of Australia. The Riksbank, on the other hand, has kept its corridor system but

⁴⁵ Some central banks have clearly communicated that they have switched from a floor system, while other central banks' operational frameworks function in practice as floor systems. See Hansson and Wallin Johansson (2023) for an account of the policy regimes of fourteen central banks.

reformed it. This makes the Riksbank stand out to some extent in an international context, although the Riksbank is not the only central bank that still applies a corridor system.

Some central banks have decided to permanently switch to a floor system, while others have been less explicit about whether and when they plan to return to a corridor system. Some central banks have also been more explicit than others about the motives behind this change. However, the trend of moving from corridor to floor systems can be seen in the context of two main changes in financial markets since the global financial crisis.

One change is that after the global financial crisis, many central banks, including the Riksbank and all of the above, have used asset purchases to make monetary policy more expansionary, thereby increasing the liquidity surplus of the banking system towards the central bank. The second change is that interbank activity in several countries has declined sharply since the global financial crisis. These are two changes in the financial markets that can be seen as compatible with a floor system. This is because a basic condition for the proper functioning of a floor system is that the banking system has a liquidity surplus towards the central bank, and that the monetary policy counterparties have strong incentives to manage their liquidity balancing with the central bank.

These two phenomena, excess liquidity and less interbank activity, have also occurred in Sweden. Nevertheless, the Riksbank has continued to apply a corridor system. The main reason for this is that the Riksbank, possibly in contrast to the other central banks, has not made the assessment that these changes limit the functioning of the corridor system. The Riksbank therefore assesses that the corridor system is still the most appropriate system for the Riksbank, based on the objectives and restrictions that the Riksbank has formulated for its operational framework.

The interest-rate formation achieved by the Riksbank in recent years can also be seen as proof that the corridor system has worked well for the Riksbank, despite the changes in the financial markets. The Riksbank has succeeded in stabilising short-term market rates at a desired level both in the period between 2012 and 2022, when the Riksbank had a large and growing liquidity surplus, and in the period from 2023 onwards, when the Riksbank's surplus has started to decline. Nor has the corridor system limited the Riksbank's ability to switch from buying to selling securities during these years.

However, such a change in monetary policy can be complicated for a central bank applying a floor system, as this type of operational framework requires the central bank to maintain a liquidity surplus. The fact that several central banks have moved from conducting expansionary monetary policy for several years to now conducting contractionary monetary policy has also highlighted this and a number of other challenges and issues arising from having a floor system. These include the need to understand the dynamics of the demand for reserves and the optimal or sufficient level of excess liquidity, as well as the extent to which the central bank can and should

control these parameters.⁴⁶ The lack of simple and unambiguous answers to these questions has also stimulated a debate on the risks of the floor system and whether there might be reasons to return to corridor systems.⁴⁷

6.2 An increasing number of central banks are widening the set of counterparties beyond credit institutions

In recent years, it has become increasingly common for central banks to expand their set of counterparties beyond credit institutions to include additional financial firms.⁴⁸ These include central counterparties, money market funds and insurance companies.

Among the central banks that have chosen to broaden their set of counterparties are the Federal Reserve, the Bank of England, the Swiss National Bank, the Reserve Bank of Australia and the Reserve Bank of New Zealand. It is also common for central banks that have widened their set of counterparties to provide counterparties with differentiated access to the instruments in the operational framework, i.e. not all counterparties have access to all instruments under the same conditions.

The trend towards an increasing number of central banks expanding their set of counterparties can be seen in the light of the fact that there are more types of financial agents today than before, and that the financial system today is less bank-based and more market-based than before. This means that more types of agents may be important for interest-rate formation and for monetary policy transmission. Unequal access to markets and central bank policies risk segmenting interest-rate formation in short-term money markets.⁴⁹

In Sweden, too, there has been a shift towards more market-based financing.⁵⁰ The number and types of agents that are active in financial markets have also increased. However, the Riksbank's set of counterparties is limited to credit institutions, see Section 4.3. However, the Riksbank did not analyse the set of counterparties when reviewing the operational framework in 2014, which led to the reform of the operational framework's instruments and collateral between 2019 and 2022.⁵¹ Against this background, it seems likely that the Riksbank may review the set of counterparties in the foreseeable future, and that the Riksbank, like many other central banks, will then need to consider whether or not it should be expanded.

⁴⁶ See, for example, Acharya et al. (2022) for a study on the drivers of the demand for reserves and its implications for a central bank's ability to reduce the liquidity surplus of the banking system towards the central bank.

⁴⁷ See, for example, Borio (2023) for a discussion of the development of several central banks moving from a corridor system to a floor system after the global financial crisis, and why there is reason to go back.

⁴⁸ See Hansson and Wallin Johansson (2023) for a review of fourteen central banks' operational frameworks, including their respective sets of counterparties.

⁴⁹ See, for example, Eisenschmidt and Ma et al. (2022) for a study on how the balance of power between different financial agents in the euro area repo market can contribute to segmentation in interest-rate formation and affect monetary policy transmission.

⁵⁰ See Finansinspektionen (2022) for an account of the development of market-based financing in Sweden.

⁵¹ See Sellin and Åsberg Sommar (2014) for the review of the Riksbank's operational framework and the Executive Board's decisions on changes to the operational framework: *Amendments to the Riksbank's operational framework for the implementation of monetary policy* on 24 September 2019 and *Amendments to the Riksbank's operational framework for the implementation of monetary policy - Step 2* on 22 March 2022.

6.3 An increasing number of central banks are offering instruments for financial stability purposes

Since the global financial crisis, it has become increasingly common for central banks to offer instruments within their operational frameworks that have an explicit aim of safeguarding financial stability.⁵² These instruments usually consist of various forms of lending by the central bank.

These instruments can take the form of both standing facilities and recurring open market operations, and generally aim to provide liquidity in the event of market failures. These instruments are typically offered to a wider range of participants than those who have traditionally had access to the monetary policy framework, making this development consistent with that of widening the set of counterparties. The instruments offered for financial stability purposes are however also clearly linked to monetary policy. This is because they ensure that market turbulence and dysfunctional markets do not spread and thereby interfere with the interest-rate formation that the central bank wants to achieve with the operational framework. As a result, these instruments are often similar to those offered by the central bank for monetary policy purposes. It can be difficult both to make a clear distinction between them and to isolate their effects on financial markets and interest-rate formation from one another. Because of the synergies, it is also increasingly common for central banks to take a more holistic approach to the two policy areas. They more often talk about instruments for liquidity provision and interest-rate steering, rather than for either monetary policy or financial stability.

The Bank of England and the Bank of Canada are two examples of central banks that have established instruments with a clear stability purpose. There are also central banks that cite several reasons for their instruments, with the functioning of markets or stability being mentioned as one of them. Two examples of this are the Reserve Bank of New Zealand and the Federal Reserve.

These developments can be seen against the background of the growth of financial stability as a policy area since the global financial crisis, and the fact that central banks have increasingly been given the main responsibility for this area.⁵³ Moreover, the global financial crisis and several subsequent events, such as the US repo market turbulence in autumn 2019 and the UK liquidity crisis in autumn 2022, have highlighted that market failures and financial market turbulence are a recurring feature that central banks have to deal with. This is because there may otherwise be spill-over effects that affect both the real economy and the interest-rate formation that the central bank wants to achieve.

It can be noted that the Riksbank does not offer any standing facilities or recurring market operations for stability purposes. Instead, the Riksbank offers general liquidity support or emergency liquidity assistance where justified. At the same time, the Riksbank stands out in an international context by having a relatively limited mandate

⁵² See Hansson and Wallin Johansson (2023) for a review of fourteen central banks' operational frameworks.

⁵³ See Calvo et al. (2018) for a discussion of how financial stability has evolved as a policy area after the global financial crisis and how responsibilities are shared between authorities in different jurisdictions.

and responsibility for financial stability, which limits its ability to act for this purpose. However, the Sveriges Riksbank Act that entered into force on 1 January 2023 has clarified the Riksbank's financial stability mandate. Given this, as well as the trend we see in how other central banks handle these two policy areas, it seems likely that we may see a debate on a more holistic approach to liquidity provision and interest-rate steering in the future.

7 Concluding remarks

The Riksbank's operational framework has become simpler, more robust, automatic and flexible following the reform between 2019 and 2022. These aspects were also some of the main intentions of reforming the operational framework for monetary policy. The reform has made the operational framework more flexible both for structural changes in the payment and financial markets, and if the Riksbank wishes to develop the operational framework further. This means that the reformed operational framework creates favourable conditions for robust interest-rate steering.

Since the final changes to the operational framework entered into force in June 2022, the general level of interest rates has changed significantly up to autumn 2023. This means that the operational framework has really been tried and tested. It is therefore particularly reassuring to see that, over this period, short-term market interest rates have shown a good degree of responsiveness to the policy rate, and that interest rates have been generally stable close to the policy rate. The reformed framework has thus largely achieved good interest-rate steering, thereby fulfilling its primary objective.

In addition, the benefits of applying a corridor system have become even more apparent during this period. The fact that the effectiveness of the operational framework does not depend on the structural liquidity position of the banking system has facilitated and ensured good interest-rate steering when the Riksbank moved from a low interest rate regime with quantitative easing to a high interest rate regime with quantitative tightening in 2022 and 2023. In the coming years - when the Riksbank, according to the current decision, will reduce the liquidity surplus through active sales and its securities holdings maturing - it will probably become even more evident that this universal aspect of the operational framework is favourable to interest-rate steering.

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APPENDIX

Table 3. Changes to the operational framework in the context of the reform

Date of implementation	Changes to operational framework
9 October 2019	Fine-tuning transactions cease.
9 October 2019	The interest rate on the standing deposit facility (deposit rate) is set at the policy rate -0.10 percentage points.
2 July 2020	The interest rate on the standing lending facility (lending rate) is set at the policy rate +0.10 percentage points.
8 June 2022	The supplementary liquidity facility is established in which lending is carried out against secondary collateral at an interest rate (the liquidity facility rate) equal to the policy rate +0.75 percentage points.
8 June 2022	The collateral requirements for the standing lending facility are tightened to the primary collateral pool.

Source: The Riksbank