How is monetary policy implemented in practice?

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When central banks' decisions on what is commonly referred to as monetary policy are discussed in various contexts - for example, in the media, in academic circles or, for that matter, between individuals - the focus is often on how the "interest rate" can be expected to evolve in the future. It is also usually discussed how the interest rate can affect, and is affected by, developments in inflation and economic activity more generally. However, little attention is paid to the exact interest rate involved, how central banks implement their interest rate decisions and what the channels are between the central bank's instruments and the rest of the economy.

This article provides a broad overview of the central bank's tasks and toolkit. We also highlight many factors that central banks need to take into account when designing their systems to steer interest rates and other methods of influencing the financial system and the wider economy.

1 What are they trying to steer?

There are many similarities in the way central banks conduct monetary policy in different countries. However, the concrete design is influenced by the nature of the financial system and there are still some differences here between countries. The financial system changes over time, which also leads to different practices regarding the details of the monetary policy operational framework.[1]

In this article, we start by describing the tasks of central banks, as this obviously has implications for how they design their operational frameworks. We then turn to the methods they use to influence interest rates and the supply of liquidity and credit in

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[1] A systematic overview of how central banks design their monetary policy operational frameworks can be found in Borio (1997), followed by Sellin and Åsberg Sommar (2014), Bindseil (2016) and Hansson and Wallin Johansson (2023 b).

the economy. Finally, we highlight some important factors and principles they need to consider when designing their operational frameworks.

Table 1. Central bank objectives and tasks

Central bank	Objective
Norges Bank	• Maintain monetary stability and to promote the stability of the financial system and an efficient and secure payment system. • Contribute to high and stable output and employment.

Reserve Bank of New Zealand	• Economic objectives:
	  ○ Achieve and maintain stability in the general level of prices over the medium term.
	  ○ Supporting maximum sustainable employment
	• Financial stability:
	  ○ Protecting and promoting the stability of New Zealand's financial system

ECB	• Primary: Maintain price stability • Secondary: Support the general economic policies in the Union, contribute to the smooth conduct of policies pursued by the competent authorities relating to … the stability of the financial system

Bank of England	• Financial stability: Protect and enhance the stability of the financial system
	• Monetary policy:
	  ○ Maintain price stability
	  ○ Support the economic policy of His Majesty's Government, including its objectives for growth and employment

Federal Reserve	Promote effectively the goals of maximum employment, stable prices and moderate long-term interest rates
Sveriges Riksbank	• Overriding objective: maintain permanently low and stable inflation • Without neglecting the price stability objective: contribute to a balanced development of production and employment. • Without neglecting the price stability objective: contribute to the stability and efficiency of the financial system, including the ability of the public to make payments.

Source: The Bank of England Act, 1998, the Federal Reserve Act, Act relating to Norges Bank and the monetary system (Central Bank Act), Reserve Bank of New Zealand Act 2021, Sveriges Riksbank Act, The mandate of the ECB: The mandate of the ECB:.The mandate of the ECB.

While the tasks of central banks are not exactly the same in all countries, there are significant similarities in the way the objectives of their activities are formulated. Overall, it is about maintaining price stability, high employment and the stability and efficiency of the financial system. Table 1 summarises the targets for a few different central banks.

While a well-functioning financial system can be an end in itself, the financial system plays an important role in enabling the central bank to achieve its price stability and employment objectives. This is because the central bank's measures work via the financial system. To put monetary policy and financial stability decisions into practice, the central bank needs to be able to conduct financial transactions with participants in the financial system. The characteristics of the system therefore influence how the central bank needs to design its measures.

While the tools may differ slightly between central banks, they all basically work through the financial system. The financial system is said to have three main functions: facilitating payments, transforming savings into investments and facilitating risk management. These functions are used daily by individuals, households, companies and other organisations. Private banks and other so-called financial intermediaries help with this, but the financial system has proved to have some inherent instabilities that require a bank for the private banks as well - a state central bank.[2] To put it simply, the role of the central bank is to ensure that the amount of money in society, i.e. liquidity, develops so that the economy can grow at a healthy and stable rate.[3] This includes the central bank being able to coordinate liquidity support when needed, and lend money to solid but illiquid banks - acting as a lender of last resort.

For the economy to function effectively, there must be widely accepted and liquid means of payment and systems for individuals and organisations to make payments for the services and goods they want to exchange with each other. They must also be able to provide credit to each other. It is not efficient to keep all your savings in the form of cash or other assets that can be quickly converted into cash, i.e. highly liquid assets. Savings can yield higher returns if they can also be used to finance longer-term investments. Therefore, individuals often have an asset portfolio consisting of both liquid assets, such as cash or bank deposits for current expenses, and financial investments, such as bonds and shares, for longer-term savings. Added to this are real assets, such as housing.

Banks play an important role in helping households and companies to allocate part of their savings to investments that generate positive returns, while allowing them to have access to cash for payments. While state-issued banknotes and coins have historically played an important role in the payment system, various forms of private money have also always been important. The public has for a very long time been

[2] However, a central bank is not enough. Regulation of the financial system is also needed, and supervision by both the central bank and regulatory authorities. In Sweden, Finansinspektionen is responsible for the regulation and supervision of the financial system. In some countries this is the responsibility of the central bank. The focus here is on the central bank's role as the "bank of the banks".

[3] See Capie et al. (1994).

making their payments by varying either the money they hold in accounts with private banks or their debts to banks.[4] The public's bank account balances are commercial bank money. Banknotes and coins issued by central banks as well as banks' claims on the central bank are central bank money. Today, virtually all household and corporate payments are made in commercial bank money and only a very small proportion in central bank money. However, banks' transactions with each other often take place through accounts with the central bank using account-based central bank money.

Banks make transactions with each other all the time, mainly because their customers make payments to each other. Transfers between banks are made in a centralised payment system, usually provided and operated by the central bank. If a large proportion of a bank's customers suddenly want to withdraw a lot of their long-term savings, the bank may find it difficult to obtain the funds. This is because the bank has lent out these savings on a longer-term basis to generate higher returns. Banks can then borrow from each other, possibly with the central bank acting as an intermediary, where the central bank takes deposits from one bank and lends to another. Under normal circumstances, a large number of transactions take place between banks during the day, without generating significant liabilities either between banks or to the central bank overnight. But sometimes there are shocks that require the banking system to make large deposits or borrow from the central bank on a more permanent basis. The interest rates and conditions set by the central bank for such loans and deposits affect the interest rates that banks then set both on transactions among themselves and with their customers.

The need for means of payment changes over time, for example as a result of changes in economic activity. In principle, this could lead to large variations in interest rates when households and companies want to change the allocation of their savings. Having too much or too little money in the economy can also lead to an increase or decrease in the prices of goods and services, i.e. inflation or deflation. While it is natural for prices and interest rates to change, excessive fluctuations can make economic activity more volatile than desirable. The central bank, as the banks' bank, must therefore ensure that the supply of money and credit runs smoothly and promotes sound and stable economic development. This is why central banks often have objectives and tasks as in the examples in Table 1: price stability, stable and high levels of output and employment, and the stability and efficiency of the payment and financial system in general.

2 How does the central bank control interest rates and the supply of liquidity?

We can start from the Riksbank's balance sheet to describe how the Riksbank can affect interest rates in the economy and the supply of liquidity, which in turn has significance for the supply of credit, inflation and employment. You can find the balance sheet in Table 2.

[4] See, for example, Roberds and Velde (2016).

Table 2. The Riksbank's balance sheet as at 31 December 2022

SEK million

Assets		**Liabilities**	
Gold	76,488	Deposit facility	574,293
Receivables from the IMF	116,053	Debt certificates issued	583,848
Foreign currency reserves	482,336	Debt to the National Debt Office in foreign currency	76,140
Structural transactions	-	Counterpart of Special Drawing Rights	90,833
Lending facility	-	Other liabilities	11,087
Securities in SEK	823,744	Provisions	423
Other	1,340	Revaluation accounts	116,563
		Equity	62,522
		Banknotes and coins in circulation	64,956
		Reported result	-80,734
Total	1,499,961	Total	1,499,961

Note: For the financial year 2022, a loss of around SEK 80 billion was reported, which is shown in this way in the balance sheet as the decision on how to allocate it will be taken when the annual accounts for the financial year 2023 are adopted.

Source: Sveriges Riksbank (2023)

To put monetary policy decisions into practice, the central bank must be able to conduct financial transactions with participants in the financial system. Not all items on the balance sheet have a role in what is commonly referred to as monetary policy, but let's look at the most relevant items.

Central banks can use various monetary policy instruments to steer and influence interest rates in the economy. It is the central bank's monetary policy counterparties - banks - that have access to the monetary policy instruments. The monetary policy instruments are usually divided into so-called standing facilities, which can be used at the initiative of the central bank's counterparties, and so-called open market operations, which are conducted at the initiative of the central bank.

The Riksbank's deposit and lending facilities are examples of **standing facilities**. These are borrowing and lending facilities that are in principle always open, even if they are only offered to a certain group of counterparties and under certain conditions. It is therefore up to the counterparties (banks) when they want to utilise these opportunities and how much. When the Riksbank, on its own initiative, increases or decreases the amount of central bank money in the banking system by issuing

Riksbank certificates, offering deposits or loans at longer maturities or changing its holdings of securities, it is instead called **market operations**.

To begin with, we can observe that the **lending facility** was not utilised at the end of 2022, while the **deposit facility** totalled a large amount.[5] The amounts the banking system has placed at the Riksbank overnight constitute deposits, while what the banks borrow overnight constitutes lending. As noted above, a lot of money is transferred between private banks in a day. This takes place in a payment system managed by the Riksbank called RIX.[6] In 2022, the average daily turnover in RIX was SEK 553 billion, which is much more than the value of everything produced in Sweden in one day - GDP per day averaged around SEK 16 billion. This reflects, among other things, the fact that there is a lot of trade in goods and services every day, but not always new products. For example, the sale of a home involves a transfer from one bank to another. This may be reflected in RIX, but it does not imply a corresponding increase in GDP. Trade in financial instruments also gives rise to transactions between banks and via the Riksbank without giving rise to output that is reflected in GDP to the same extent.

During the day, a bank can receive payments from other banks via RIX that are larger or smaller than its payments. The Riksbank provides credit during the day when banks have deficits and accepts deposits when they have surpluses. Surpluses or deficits during the day are interest-free, but the Riksbank pays interest on the funds the banks have in their accounts overnight, called the deposit rate. If the banks instead have a debt to the Riksbank, they have to pay interest for it, the lending rate.

The fact that the volume of the deposit facility was so large while the lending facility was barely utilised in 2022 is mainly due to the Riksbank having built up a large holding of **securities in Swedish kronor**. The Riksbank has purchased government bonds, municipal bonds, mortgage bonds and corporate bonds. When the Riksbank buys these securities via monetary policy counterparties from banks, pension companies, fund managers and others, this results in payments from the Riksbank that ultimately increase the banking system's balances with the Riksbank. In some countries, there are formal requirements for banks to hold a certain proportion of their deposits from bank customers as reserves with the central bank, known as reserve requirements. But in Sweden, the Riksbank does not apply any reserve requirements, so the banking system's deposits with the Riksbank have other causes.

At the end of 2022, around half of the banking system's claims on the Riksbank consisted of **issued debt certificates**. They are Riksbank certificates in the case of Sweden and the Riksbank - other central banks have other solutions for the banks' claims on the central bank. Riksbank certificates are interest-bearing securities with a one-week maturity issued by the Riksbank. One difference between the banks' deposits in the Riksbank and the Riksbank certificates is that the certificates are

[5]Although the balance sheet states that the Riksbank's standing lending facility was not utilised at the end of the year, there are occasions when banks borrow smaller amounts from the Riksbank's standing lending facility.

[6] See the Riksbank's website for information on RIX: The RIX payment system | Sveriges Riksbank and the Riksbank's annual report for 2022, Sveriges Riksbank (2023).

securities that the banks can sell to other participants in the secondary market, while the overnight deposits are only a transaction between the Riksbank and the bank in question. The difference for a bank between having deposits at the Riksbank and having a Riksbank certificate is thus in principle the same as the difference between when a household has money in a bank account and when it has a bond or a fund unit. Riksbank certificates do not provide liquidity to the same extent as deposits, but on the other hand, they provide a slightly higher return.[7] One benefit of the fact that the certificates are transferable both between the monetary policy counterparties and to their customers is that they provide access to central bank money even for participants who are not part of the Riksbank's counterparty group. This helps to reduce the segmentation of interest-rate setting in the market, i.e. different categories of participants encounter different interest rates. The interest rate on the certificates corresponds to the Riksbank's policy rate, and is 10 basis points higher than the interest rate on overnight deposits. The interest rate on Riksbank certificates is thus in practice the interest rate that the Executive Board of the Riksbank decides on and which it considers to be compatible with the Riksbank achieving the objectives of its monetary policy. By offering Riksbank certificates and unlimited overnight lending and borrowing, the Riksbank tries to control interest rates in the economy to achieve the inflation target and keep the real economy stable.

The reason why approximately half of the banking system’s claims on the Riksbank consisted of Riksbank certificates in 2022 is that from May 2021 the Riksbank limited the possibility for the monetary policy counterparties to place at most half of their claims on the Riksbank in the form of Riksbank certificates. The counterparties had to place the remainder of their claims as overnight deposits with the Riksbank. Since February 2023, the Riksbank has ceased this restriction and instead offers its counterparties the opportunity to invest the banking system's total claims on the Riksbank in the form of Riksbank certificates, if they so wish. When the Riksbank offers an issue volume of Riksbank certificates that corresponds to the banking system’s total claims on the Riksbank, the banks’ incentive to balance liquidity among themselves at an interest rate close to the policy rate is therefore strengthened. Since February 2023, the banks have chosen to hold almost 90 per cent of their balances at the Riksbank in the form of Riksbank certificates.

3 How do the Riksbank's decisions affect market interest rates?

In the article by Hansson and Wallin-Johansson (2023a) in this special issue, you can find more details on the Riksbank's interest rates and other conditions tied to the deposit and lending facilities and the Riksbank certificates. In brief, it can be said that the Riksbank has considerable scope to influence the general level of interest rates in the financial system with the aid of the standing facilities and market operations. The interest rates on the standing facilities and Riksbank certificates affect the interest rates on short-term transactions between financial market participants, as some of

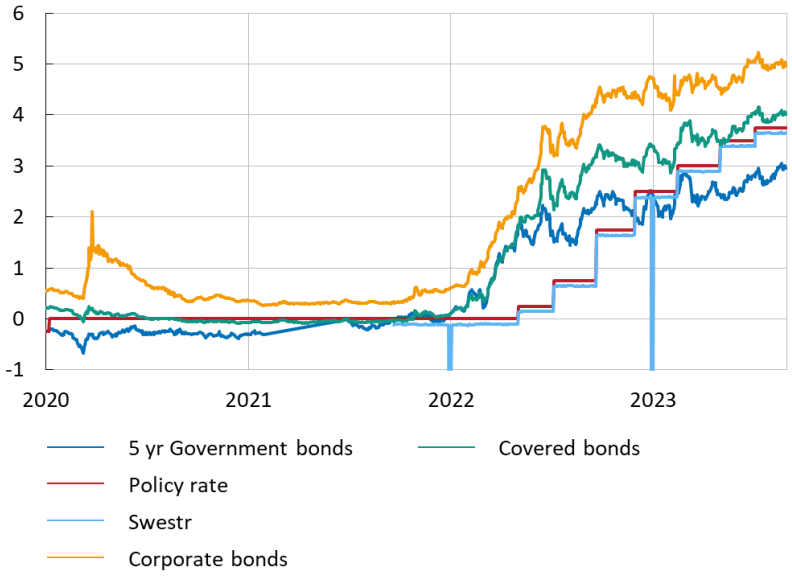
[7] The certificates can be sold back to the Riksbank in advance, but the counterparty must wait until the day after the resale to have the money available as overnight deposits at the Riksbank.

them may choose to either have claims on or borrow from the Riksbank. The Riksbank's deposit and lending rates are the rates at which the Riksbank's monetary policy counterparties can be sure that they can always place or borrow unlimited amounts against adequate collateral at the Riksbank. The Riksbank's deposit and lending rates therefore represent the opportunity cost of money when banks borrow money from each other from one day to the next in the overnight market. This gives banks with a liquidity surplus an incentive to lend money to a bank with a liquidity deficit at an interest rate that is higher than the Riksbank's deposit rate, but lower than the lending rate. This is because the bank with a liquidity deficit can otherwise always borrow from the Riksbank's standing lending facility.

Figures 1 and 2 show how a selection of market rates have developed together with the Riksbank's policy rate. The policy rate is the interest rate decided by the Executive Board of the Riksbank.

Figure 1. The Riksbank's policy rate and market rates

Per cent

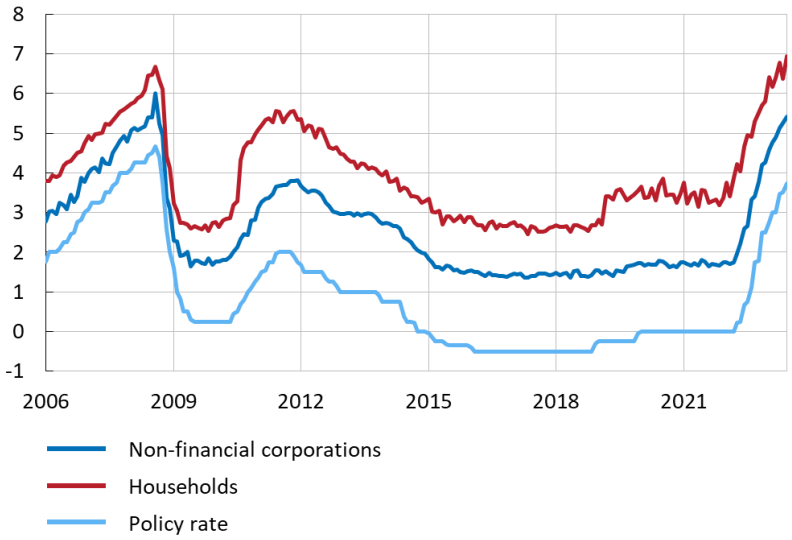


Note: Corporate and mortgage bond yields estimated with zero coupon rates using the Nelson-Siegel method.

Source: Riksbank, Bloomberg

Figure 2. The Riksbank's policy rate, the banks' lending rate to households and companies respectively

Per cent



Note: Foreign banks with branches in Sweden that are monetary policy counterparties are not included.

Source: Statistics Sweden

For various reasons, different market rates deviate from the Riksbank's policy rate. For example, yields on government securities have often been lower than the policy rate. This is due to various factors, such as government bond yields reflecting expectations of future short-term interest rates, including the policy rate. There is also an established and well-functioning liquid secondary market for government bonds. Yields on, for example, corporate bonds are higher than the interest rate on Riksbank certificates (the policy rate) because they are associated with higher risk.

However, the Riksbank's operations affect interest rates on virtually all types of securities and loans. Expectations of the Riksbank's policy rate affect both short-term and long-term interest rates. When the Riksbank conducts market operations and buys or sells bonds in the secondary markets, it also affects interest rates on securities with both short and long maturities. Short market rates in turn affect the banks' funding costs and thus short-term variable mortgage rates. Longer market rates affect, for example, the longer-term funding costs of banks and companies and the interest rates on longer-term mortgages. So the Riksbank's toolkit, as reflected in its balance sheet, has a major impact on the availability and cost of liquidity and credit in the economy, and thus on economic activity and general price developments.

However, it is not the case that the central bank's policy rate is the sole determinant of other interest rates. Depending on the market, the participants and instruments involved and the maturity of the transactions, interest rates reflect different risk premia and market conditions. Both market rates and the central bank's policy rate are also affected by developments in the economy and financial markets. For example, it is not just that longer rates reflect expectations of future policy rates and other short-term interest rates. The causal relationship can sometimes be the reverse,

for example, uncertainty about the long-term economic outlook leads to volatility in longer rates, which in turn causes volatility in the shortest rates.[8]

We see in Figure 1 that some market rates have at times been lower than the Riksbank's policy rate. When the Riksbank bought large amounts of Swedish securities, yields on government securities and mortgage bonds, for example, were pushed below the policy rate. The yields on government securities and mortgage bonds have longer maturities than the Riksbank's policy rate and when they are lower than the policy rate it partly reflects expectations of lower future policy rates. Corporate bond yields were also pushed down as a result of the Riksbank's securities purchases. This was partly an intended effect and reflects that those who sold government and housing securities to the Riksbank then needed to make other investments. However, the risk premia associated with investments in corporate bonds meant that their yields remained higher than the policy rate. The Riksbank's expanded asset purchase programme expired in December 2021, the policy rate started being raised in April 2022 and the Riksbank has been selling government bonds since April 2023. This has led to rapid upward pressure on market rates for all asset classes. The reference rate SWESTR, which stands for the Swedish krona short term rate, indicates the interest rate at which banks can borrow money in the overnight market in Swedish krona.[9] The Riksbank's deposit rate, which is 10 basis points below the policy rate, essentially sets a floor for the interest rate in the overnight market in Swedish kronor, as banks are always able to deposit money overnight with the Riksbank instead of lending to each other. SWESTR is therefore around 10 basis points below the policy rate. On the last business day of the year, however, SWESTR shows a significant year-end effect. Banks then reduce their own deposit rates to minimise the cost of the resolution fee and the bank levy based on their balance sheets on the last business day of the year. Therefore, at the turn of the year 2022/2023, banks reduced SWESTR by around 11 percentage points.

Figure 2 shows that the banks' interest rates for lending to both households and non-financial companies have followed the Riksbank's policy rate closely over time. However, the gaps between the policy rate and bank lending rates to households and non-financial companies have widened after the global financial crisis in 2008 and 2009. This is partly due to generally higher risk premia and to new rules for banks and financial markets introduced to reduce the likelihood of new crises.

4 More tools on the Riksbank's balance sheet

Let us return to the balance sheet in Table 2 and some items that normally do not have a strong link to the general level of interest rates, but may do so in certain situations. The Riksbank has a **foreign exchange reserve** that mainly consists of US and German government bonds. It fulfils several different functions. One is for the Riksbank to have rapid access to foreign currency if the private banks suddenly find it difficult to obtain the foreign currency they need, for example to repay loans in

[8] See, for example, Zagaglia (2008).

[9] Information on the SWESTR reference rate provided by the Riksbank can be found on the Riksbank's website: SWESTR | Sveriges Riksbank.

foreign currency. Another purpose of the foreign exchange reserve is that the Riksbank can influence the market price of the Swedish krona by buying and selling its foreign currency securities. For example, if the Riksbank buys US government bonds and finances this by increasing the debt of the Swedish banking system in Swedish kronor, it tends to lower the price of the krona in relation to the US dollar. However, since Sweden moved to a floating exchange rate in November 1992, the Riksbank does not have a target for the value of the krona against the dollar or other currencies, so in practice the foreign exchange reserve is no longer used for interventions to influence the krona exchange rate.[10] However, the foreign exchange reserve has been needed to provide loans to the banks in foreign currency, as the Swedish banking system and the financial markets in general have become more integrated with the rest of the world. Of course, in small, open economies, foreign exchange reserves are a more important item on the central bank's balance sheet than in the United States and the euro area, for example. This can affect both the size of the balance sheet, relative to GDP for example, and its composition, as the foreign exchange reserves have to be financed in some way - the larger the asset side, the larger the liability side has to be.

Thus, since the abandonment of the exchange rate target in November 1992, foreign exchange reserves do not normally change to affect interest rates, liquidity and credit conditions. But decisions on foreign exchange reserves may still have some such indirect effects. Part of the foreign currency reserve has previously been financed by loans in foreign currency raised by the Swedish National Debt Office, which is reflected in the item **Debt to the Debt Office in foreign currency** in Table 2. If the Riksbank changes its assets and liabilities in foreign currency by roughly the same amount, there is probably little effect on the exchange rate, the availability of liquidity or the markets for securities in Swedish kronor. However, when the Riksbank changes the allocation of domestic and foreign currency in its assets and liabilities, it can affect both market interest rates in Sweden and the exchange rate of the Swedish krona.[11]

The quantity of **banknotes and coins in circulation** does not normally have any significance for interest rates and other financial conditions in Sweden. It is essentially demand-driven as long as the Riksbank does not make any formal decisions on how many banknotes and coins should circulate in society. The Riksbank supplies the volume of banknotes and coins that households, banks and other companies demand. When the demand for banknotes and coins grows, the Riksbank distributes more banknotes and coins to the banks, which reduce their deposits with the Riksbank by a corresponding amount. As banknotes and coins do not bear interest, their demand is to some extent influenced by the general level of interest rates. If, contrary to its normal strategy, the Riksbank were to fail to match the supply of banknotes and coins to demand, this could in principle affect interest rates, as there could be an excess

[10] However, the Riksbank intervened to strengthen the krona in 2001, and from January 2016 to February 2019 it had special preparedness to intervene if the krona became too strong. See Bylund et al. (2023).

[11] Interest rates in kronor and foreign currency are also affected by expectations of exchange rate developments. If the krona is expected to depreciate against foreign currencies, investors will want to be compensated for this, putting upward pressure on domestic interest rates relative to foreign ones. This is because capital can move between countries and the relationship is usually described in terms of different variants of 'interest rate parity'.

demand or supply of liquidity that could affect prices and interest rates even for less liquid assets. There are well-known examples from history and from other countries where governments have chosen to finance their expenditure through the banknote printing presses, leading to high inflation. This is not a problem that is relevant for Sweden, but it shows that there are links between monetary policy and the quantity of banknotes and coins.

The e**quity** item in the balance sheet is determined by the profits or losses the Riksbank makes in its operations, and whether the Riksbank either pays dividends to the government budget or receives contributions from it. It is normal that the Riksbank, like other central banks, makes a profit from its operations and that a large part of it is distributed to the Treasury. The profit comes essentially from the fact that most of the Riksbank's liabilities are associated with lower interest rates than the return on assets. The liabilities may even have zero interest, such as banknotes and coins or equity, including revaluation accounts.[12] When the Riksbank distributes funds to the Treasury, equity is reduced and some other item on the balance sheet must also be affected. Depending on whether the Riksbank finances the distribution to the government budget by reducing its holdings of securities in kronor or foreign currency or by increasing deposits from the banking system, the effects on interest rates in Sweden and the exchange rate of the krona may be different. In the annual report for 2022, the Riksbank reports a loss of almost SEK 81 billion, mainly because the market value of the Riksbank's holdings of Swedish securities has decreased. This means that at the time of writing the Riksbank has negative equity of around SEK 18 billion. Under the new Sveriges Riksbank Act, which came into force in January 2023, the Riksbank must submit a request to the Riksdag for a capital injection when the Riksbank's equity falls below a base level of SEK 20 billion, adjusted for inflation.

5 What influences the design of the operational framework?

As noted at the outset, the discussion of "monetary policy" in the media and among the general public focuses on the "interest rate" set by the central bank. We have shown that there are several different interest rates that the central bank needs to decide, and that the central bank's decisions also have effects on many other interest rates, i.e. the general level of interest rates. In addition, the central bank may take decisions other than interest rate decisions, such as buying or selling domestic or foreign currency securities, which also affect financial market interest rates and thus the interest rates on loans to households and companies and the return on their savings. In this section, we will show what the central bank needs to consider when designing its operational framework. These are not considerations about the level of the policy rate or securities holdings, etc., but more detailed and technical aspects of the operational framework.

[12] The revaluation accounts reflect unrealised profits made by the Riksbank when assets and liabilities are recorded at current market value.

5.1 Some general principles for central bank operational frameworks

Central banks have different tasks and objectives, as described above, and therefore need to consider a number of different criteria when designing their systems and strategies to influence the conditions in the financial system.[13] The system needs to

- be accurate
- be easy to understand
- contribute to both efficiency and stability
- limit risks
- promote healthy competition in the financial system.

The measures included in the policy framework need to be well targeted, as different measures have different impacts on liquidity and credit conditions for households and companies. Central banks have reasons to choose methods whose impact is believed to be well understood. In practice, central banks need to formulate an operational target that they steer towards on an ongoing basis, in addition to the longer-term objectives of monetary policy such as inflation and employment. Nowadays, this is often a target for the shortest market rate. In the past, central banks have used the exchange rate or money supply as operational targets.

The methods for implementing monetary policy should also be reasonably easy to understand - robust and transparent. The nature of the financial system is changing, both in the short term and temporarily, as well as in the longer term. Therefore, the effects of a given measure will inevitably vary over time. Therefore, the operational framework itself should be as robust as possible and designed to cope with different conditions that cannot be fully anticipated today. At the same time, the framework must be understandable and predictable for households, companies and financial market participants - and not least for the central bank itself.

The framework should contribute to both the efficiency and stability of the financial system. There are obvious conflicts of interest here. For example, while the central bank may take extensive measures to stabilise financial markets, they may be less efficient if market participants expect the central bank to address all problems.

The framework should also not result in the central bank and the state taking excessive risks that should really be borne by private agents. The task of the central bank is not to generate profits for the state, although the profits should be sufficient to enable the central bank to cover its costs and in this sense be financially independent. Sometimes the central bank has to take on risks that no other participant in the financial system wants to bear, in order for the economy to develop

[13] The criteria below are inspired by Bindseil (2016). In his Figure 1 on page 196 he lists three objectives - "monetary policy", "general objectives" and "financial objectives" - which in turn have two to four sub-objectives. On page 260 he lists the objectives as "interest rate control", "incentives, preserve market netting" and "central bank protection".

favourably. But normally, the central bank should avoid taking large risks since this can lead to financial losses or to negative effects on the behaviour of private agents.[14]

Finally, the central bank must also promote healthy competition in the financial system. This is already part of the efficiency objective, but it is worth emphasising that central bank actions should ideally not distort competition in the financial system. However, competitive neutrality may conflict with other objectives - for example, treating some financial market participants more generously may result in higher accuracy, robustness and lower risk than fully market-neutral principles.

Bindseil (2016, p. 192) draws a lesson from the 2008 financial crisis: ”The design of the OF [operational framework] would ideally be supportive to the banking system’s ability to provide maturity and liquidity transformation at the service of society, while not going as far as to facilitate *excessive* leverage and moral hazard.”

5.2 Conditions for central bank lending and deposits

Like most modern central banks, the Riksbank has standing facilities for lending to and borrowing from the banking system overnight. The Riksbank thus needs to determine the level of interest rates in these facilities, which banks and other financial intermediaries should have access to them, and the conditions, including collateral, under which counterparties should be allowed to borrow money from the Riksbank. Monetary policy can be made more or less expansionary by changing these parameters. Thus, it is not only the level of interest rates that matters, but also which counterparties the Riksbank accepts and the conditions it imposes on them, for example in the form of collateral to limit the central bank's risk.

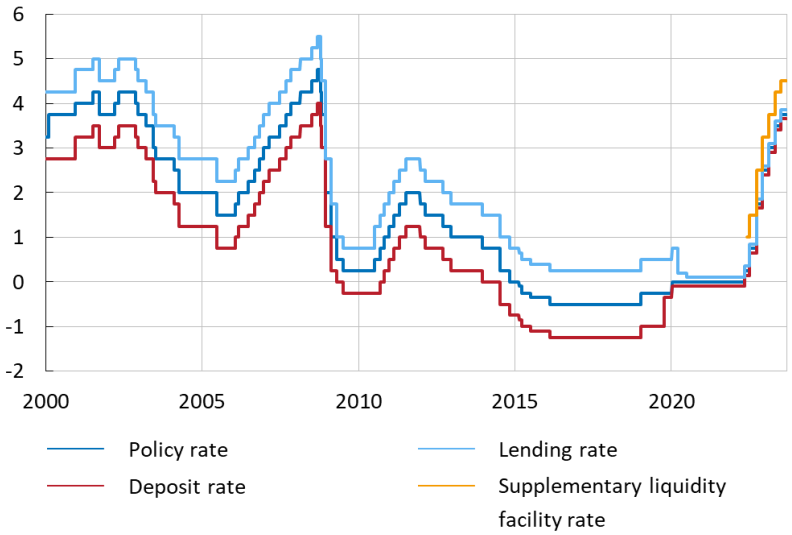
The central bank's deposit rate is normally lower than its lending rate. This creates an incentive for banks to primarily borrow from and to each other instead of turning to the central bank. This reflects a trade-off between accuracy and market efficiency. If the central bank was only looking to establish a certain level of market interest rates, it would choose a very narrow or even non-existent corridor between deposit and lending rates. This would bring the shortest market rates close to the level of interest rates desired by the central bank. But it would also give banks weak incentives to lend to and from each other. The central bank would therefore assume a major role as a financial intermediary, and the efficiency of the financial system might be low. On the other hand, a wide corridor between deposit and lending rates results in larger fluctuations in the shortest market rates, i.e. lower accuracy. Until October 2019, the Riksbank applied a corridor width of 150 basis points between the deposit and lending rates. As of June 2020, the Riksbank instead applies a much narrower corridor system with a symmetrical interest rate corridor of 20 basis points, see Figure 3. This means that through the standing lending facility the Riksbank offers its counterparties unlimited borrowing against primary collateral (government securities and claims on central banks) at an interest rate 10 basis points above the policy rate. 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 a

[14] A basic discussion of the central bank's risk-taking function, while avoiding excessive risk, is provided by Wessels and Broeders (2022).

supplementary liquidity facility. In the supplementary liquidity facility, counterparties can borrow against a wider range of collateral (the secondary collateral volume) but at a higher interest rate.[15] The liquidity facility rate corresponds to the policy rate plus 75 basis points.

Figure 3. The Riksbank's policy rate and deposit and lending rates

Per cent



Note: The supplemental liquidity facility was established on 8 June 2022.

Source: The Riksbank

Normally, the banking system borrows very little from the Riksbank. However, one of the Riksbank's tasks is to supply liquidity to the financial system as and when necessary. The Riksbank's standing lending facility, for example, is a back stop for banks, from which they know they can always borrow an unlimited amount of Swedish kronor if necessary at a predetermined interest rate and on predetermined terms, as long as they have adequate collateral. The higher the collateral requirements, the less risk for the central bank. However, high collateral requirements may also mean that less use is made of the borrowing facilities and that monetary policy becomes tighter than desirable.

There are similar balancing problems when it comes to the group of counterparties. If the Riksbank were to have generous criteria for who can have access to the facilities, this would create the conditions for good accuracy in monetary policy. On the other hand, it may lead to lower efficiency in the financial system, higher implementation and supervision costs and greater risks for the Riksbank.

From time to time, the central bank may have reasons to deviate from its normal lending or deposit conditions, or both, and take discretionary decisions to offer central bank facilities on different terms than normal. For example, the Riksbank did

[15] The secondary collateral volume consists of securities issued by intergovernmental organisations, state-guaranteed securities, covered bonds, agency securities or securities issued by non-financial companies with a sufficiently high credit rating.

this during the global financial crisis of 2008-2009. The possibility was introduced for counterparties to borrow at longer than normal maturities, not just overnight but up to one year. The group of counterparties was also widened by the Riksbank introducing the possibility for credit institutions to become "restricted monetary policy counterparties".[16] To increase counterparties' access to credit from the Riksbank, the Riksbank temporarily abolished restrictions on covered bonds as collateral for credit from the Riksbank. The limit rules that the Riksbank normally applies mean that covered bonds may comprise a maximum of half of the collateral that the counterparties provide to borrow from the Riksbank and that the counterparties may not use their own covered bonds or covered bonds issued by closely linked institutions.

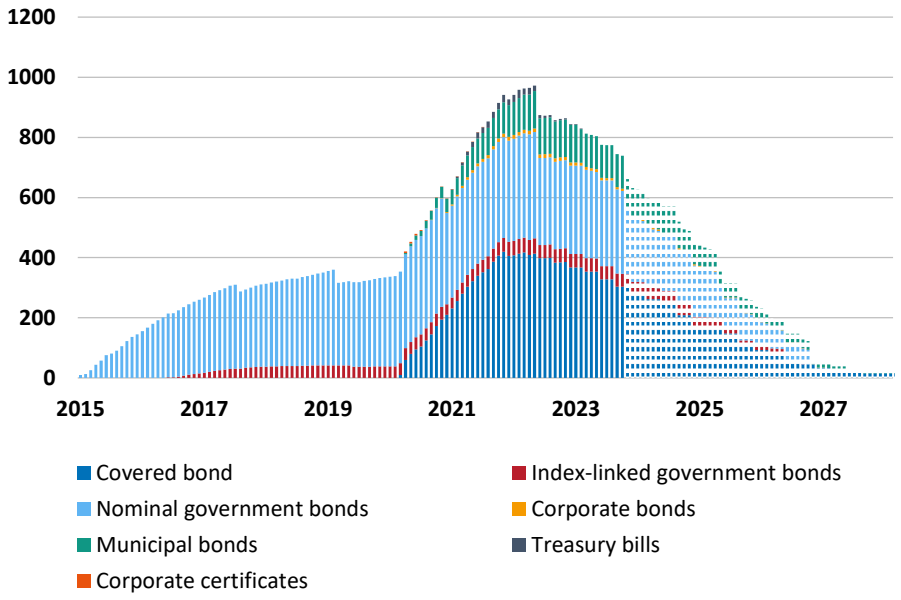
Also during the 2020-2021 pandemic, the Riksbank cancelled the limit rules for covered bonds. In addition, the Riksbank reduced the gap between the lending rate and the policy rate and offered the banks to borrow an unlimited amount of SEK against collateral with three and six months maturity at the policy rate. To stimulate bank lending to companies, the Riksbank offered banks to borrow up to SEK 500 billion against collateral, which they could then lend to non-financial companies. The group of counterparties was also expanded so that credit institutions could apply to become temporary monetary policy counterparties with access to the Riksbank's programme for lending to companies via banks.

5.3 Central bank market operations

As noted above, the Riksbank and other central banks use market operations in addition to their deposit and lending facilities to influence market rates in the financial system. Such market operations take various forms. First, the central bank can supplement the standing facilities with regular short-term market operations at the policy rate (Riksbank certificates, in the case of the Riksbank) to steer the shortest market rates sufficiently close to the policy rate. Second, central banks can vary their holdings of securities and offer lending on longer maturities to influence longer-term interest rates, credit conditions, economic activity, inflation and so on - as the Riksbank has done since 2015. Figure 4 shows how the Riksbank's holdings of different securities have developed over the years.

[16] "Restricted" meant that credit institutions that were not already counterparties or, for that matter, RIX participants were offered the opportunity to participate in certain market operations without access to standing facilities.

Figure 4. The Riksbank's holdings of Swedish securities
SEK billion



Note: The dashed bars are a forecast based on maturity and the monetary policy decision of 23 November 2023 to allow the holding of securities to decrease in line with maturity from the turn of the year 2022/2023 and the monetary policy decision of 28 June 2023 to sell government bonds at a nominal value of SEK 5 billion per month.

Source: The Riksbank.

Of course, the different operations are not conducted independently, as long-term market interest rates largely reflect market expectations of what will happen to short-term interest rates in the future. So central bank operations with short-term instruments will also affect the pricing and interest rates of long-term securities, and vice versa.

Historically and internationally, the dominant item on the central bank's asset side has normally been government bonds. In simple terms, the reason for this is that the central bank has to place its profits from issuing banknotes and coins somewhere, and the most natural option has been to lend them to the Treasury. This assumes, of course, that the central bank is owned by the state and must act in a competitively neutral manner, which it usually does.

The Riksbank had a holding of government bonds that was liquidated in 2001. The reason for this was partly that, since 1997, the Swedish National Debt Office has gradually taken over responsibility for market management of the Swedish government securities market, and partly that the Riksbank made extra transfers, SEK 40 billion, of its accumulated profits to the government budget.

During the financial crisis of 2008-2009, the Riksbank's balance sheet grew through increased lending to the banking system, both in kronor and in foreign currency. The Riksbank did not buy any securities, as other central banks did. In 2012, the Riksbank

began to build up a holding of government bonds that was initially small, with a policy portfolio of SEK 10 billion. The aim was to create operational preparedness to buy and sell government securities. From 2015, developments were also such that the Riksbank considered it justified to gradually increase its holdings of Swedish government bonds.

During the coronavirus pandemic in 2020-2021, the Riksbank continued to increase its holdings of government bonds, but also started to buy treasury bills, municipal bonds, mortgage bonds and corporate bonds. The motivation was to keep general interest rates low during the pandemic, which in turn would keep inflation and resource utilisation in the economy high, and to contribute to the smooth functioning of financial markets. At the height of uncertainty at the start of the pandemic, interest rates on securities markets rose and trading became more difficult. The Riksbank's decision to buy more types of securities than normal helped to keep interest rates down more effectively and contributed to generally calmer market conditions.

If a central bank can buy and sell securities, it needs specific rules on how it can act. These include which securities the central bank should buy, which counterparties should be used, how the transactions should be conducted and so on. Although there may be general rules in the laws governing the central bank's behaviour, the central bank itself has to set more detailed rules.

The Riksbank bought government bonds via reverse auctions in which the Riksbank's monetary policy counterparties and the Swedish National Debt Office's primary dealers had the opportunity to participate.[17] A reverse auction is a lowest-bid auction in which the bidder offering the highest interest rate receives the first allocation. After that, the bidder offering the second-highest interest rate receives allocation and so on until all the volume on offer has been allocated. This makes it clear to the market how the Riksbank prices and allocates its transactions.

To mitigate the financial consequences of the coronavirus pandemic, the Riksbank decided in spring 2020 to purchase mortgage and municipal bonds and to offer to purchase commercial paper and corporate bonds. Apart from corporate bonds, the Riksbank purchased these securities via reverse auctions in the secondary market, in which monetary policy counterparties had the opportunity to participate. The corporate bonds were also purchased on the secondary market, but through bilateral procedures.

The purchases of government, housing and municipal bonds ended in December 2022. The purchases of corporate bonds were concluded in June 2022 and purchases of commercial paper were concluded in December 2021. The Riksbank has subsequently tightened monetary policy by selling securities. In February 2023, the Riksbank decided to start selling off its government bonds as of April 2023. Together with the holdings that mature, the currently decided rate of sale of Swedish

[17] According to the ban on monetary funding in Chapter 1, Section 6 of the Sveriges Riksbank Act (SFS 2022:1568), the Riksbank may not acquire debt instruments directly from the state. Consequently, the Riksbank cannot purchase government bonds when the Swedish National Debt Office carries out issues in the primary market. The Riksbank's purchases of government bonds must be motivated by monetary policy and be made in the secondary market.

government bonds will mean that the Riksbank's holdings of Swedish securities will amount to approximately SEK 11 billion at the beginning of 2027, see Figure 4.

A question that has sometimes been the subject of intense debate among both central banks and academics is whether the central bank can best achieve its objectives by setting a policy rate that it uses to price the central bank's monetary policy instruments, standing facilities and open market operations, or a volume for some item on its balance sheet, such as securities holdings or the "monetary base", i.e. banknotes and coins plus the banks' claim on the central bank, i.e. their reserves. In some circumstances, the central bank should be able to achieve its objectives just as well by setting a price, i.e. the interest rate, as by setting a quantity for some item on the balance sheet. This would at least apply to inflation and resource utilisation targets. Of course, it is not that simple in practice. Poole (1970) published an important contribution to the literature, arguing that the central bank should endeavour to establish a certain level of interest rates if shocks in financial markets and to the demand for liquidity are common. In such cases, if the central bank tries to keep certain financial aggregates constant, it will lead to large changes in interest rates, which in turn may give rise to changes in real economic activity and inflation. If the central bank instead controls the level of interest rates and allows the volume of financial aggregates to be adjusted, the real economic effects of financial market shocks are reduced. This insight has guided the behaviour of central banks, both in normal times and during major shocks and crises. But exactly how central banks should implement their monetary policy also depends on the nature of the shocks that have occurred in financial markets. Normally, a change in a short-term interest rate by the central bank may be sufficient for the interest rate decision to affect other short-term market rates and even longer-term market rates in a reasonably predictable way. This can be said to have been an implicit assumption in Poole's analysis. But from time to time, and especially in financial crises, the transmission mechanism breaks down and the central bank needs to act directly in some specific markets or for some specific financial institutions.

Until the 2008-2009 financial crisis, there was a near consensus among central banks that they should implement their monetary policy by using corridor systems of deposit and lending rates, with or without reserve requirements, to steer the shortest market rates. Since then, many central banks have switched to floor systems where the policy rate is the deposit rate. The effective management of interest rates in a floor system requires the central bank to ensure that the banking system maintains sufficient amounts of reserves at the central bank at all times. The central bank can achieve this by providing sufficient liquidity to the banking system through lending or by buying and holding securities. This shows that monetary policy often involves trade-offs in terms of interest rates as well as the size and content of the central bank's balance sheet.[18]

[18] See Borio (2023) for a discussion of the challenges central banks face and the guiding principles they should consider in making strategic choices regarding the design of the monetary policy operational framework and the size and composition of the balance sheet.

5.4 Monetary policy codes of practice and communication

In addition to the formal rules that govern what items can be on a central bank's balance sheet and how changes to them should be implemented, the central bank needs to have a well thought-out strategy and some codes of practice for the decisions it takes to fulfil its objectives regarding inflation, employment and the stability and efficiency of the financial system.

Since the early 1990s, the dominant thinking in the central banking community has been a strategy called inflation targeting. The starting point is an explicit inflation target, which is set or jointly agreed by the central bank, government or parliament. The idea is then that the central bank will change its monetary policy instruments depending on how inflation develops in relation to that target, but with some consideration also given to developments in the real economy. The aim is for the central bank's interest rate decisions to minimise deviations of inflation from the inflation target over time, and possibly also variations in employment and resource utilisation. Such a code of practice can be described in different ways. One way is to see it as an explicit rule for how the level of the policy rate should depend on observed inflation and resource utilisation. Another is to see it as an optimisation problem in which the observed and expected development of inflation, but also, for example, resource utilisation, provides both a certain level for the policy rate right now and an expected path in the future. Of course, no central bank follows any of these rules exactly, as the reality is too complicated. Applying strict rules alone would not be effective in achieving the objectives. Nevertheless, this type of rules is often used by central banks in their internal analyses and as part of the basis for their decisions, and sometimes also as a starting point for external communication.

Central banks have generally endeavoured to communicate as clearly as possible during the period of inflation targeting. There are several reasons for this. One is that during this time central banks have gained a high degree of independence to make their own decisions. This needs to be balanced by clear information and communication from central banks so that they can be evaluated. Another reason is that expectations about future monetary policy already have effects on financial markets today. Central banks can thus influence interest rates, exchange rates and other financial market conditions through their communication. Communication has therefore become something of an instrument of central bank policy.[19]

One form of communication is that, in addition to deciding what the policy rate should be right now, the central bank also publishes information on what it expects to happen to the policy rate, inflation and resource utilisation in the future. The Reserve Bank of New Zealand was the first to publish a projected path for the policy rate in 1997, with Norges Bank and Sveriges Riksbank following suit in 2005 and 2007 respectively. Then, when many central banks found that the policy rate was close to its lower bound, they saw forward guidance as an important complement to regular

[19] For a description of the evolution of central bank independence and transparency, see Dincer and Eichengreen (2014). Holmes (2014) presents an anthropological analysis of how the way central banks describe their activities and the wider economy has influenced public perceptions.

monetary policy - as market interest rates are affected by expectations of the policy rate.

The effects of central bank purchases of securities are also sometimes interpreted in terms of "signalling". By buying or selling securities or currencies, the central bank can be seen to be signalling what it considers to be reasonable levels of interest rates and exchange rates, and hence its expectations for the policy rate. The very fact that financial market participants may interpret the central bank's actions in this way means that the central bank needs to have a strategy for its "signalling", whether or not it considers this an important channel.

Inflation targeting has generally been described as successful in various countries and evaluations. This is especially true when compared to the experience of the 1970s and 1980s, when economic development was often characterised by "stagflation" - low economic growth and high inflation.[20] But in the 2000s, new problems have emerged that were not foreseen when inflation targeting strategies were designed in the 1990s. This means that central banks have had to adapt their implementation of monetary policy to the changed circumstances. This applies to both their codes of practice and communication.

The financial crisis of 2008-2009 and its aftermath led to new forms of central bank lending, borrowing and market operations compared to what had been normal for some time. These measures have been described as "unconventional monetary policy" and have included negative policy rates, asset purchases, also known as quantitative easing (QE) and forward guidance. However, this term is misleading, as asset purchases have been a common instrument in the history of central banks. Forward guidance has also been provided in the past, not least in the form of published interest rate forecasts by some inflation-targeting central banks. However, negative policy rates are unprecedented.

The experience of the financial crisis has also led to a discussion on whether the stability of the financial system should be an additional separate objective for monetary policy, in addition to low, stable inflation and high, stable resource utilisation. The discussion has been conducted in terms of whether the central bank should "lean against the wind" and, for example, try to curb rising asset prices or excessive household debt, in addition to concern about the development of inflation or resource utilisation. A similar discussion has taken place in terms of 'lean versus clean': Should central banks limit themselves to cleaning up after a financial market failure, or should they also use monetary policy to try to prevent a failure? No one questions that central banks have a responsibility for the stability and efficiency of the financial system (see Table 1), but the question is rather whether some instruments should be linked to certain objectives and other instruments used for other objectives. As we have seen, it is difficult to draw a line on what exactly should be considered part of a monetary policy operational framework. While monetary policy has normally, at least from experience, so far been mainly concerned with setting the level of a short-term policy rate, central banks will from time to time also need to

[20] See Bylund et al. (2023).

implement their monetary policy through other types of measures, such as longer-term loans to banks or the purchase and sale of securities.

Thus, the central bank may need to adjust its balance sheet and related instruments over the business cycle to accommodate fluctuations in inflation and economic activity, and possibly also financial stability. But the balance sheet may also need more permanent changes if the financial system changes. For example, one issue discussed is that various regulations have contributed to increase the demand for safe and liquid investments. This may lead both to an increase in the demand for deposits at the central bank and to the fact that central bank purchases of securities may have different effects than before. Another question is how the growing importance of non-bank financial intermediaries (sometimes referred to as "shadow banks") should affect the way central banks formulate their monetary policy, for example with regard to counterparties and their access to standing facilities.

It has proven difficult to design rules for implementing and communicating "unconventional monetary policy" that are as simple as the rules for a central bank's interest rate decision. Negative policy rates go against the intuition of many that interest rates should be positive. Questions have been raised about whether a central bank's forward guidance in forms other than interest rate forecasts should be perceived as unconditional, i.e. a binding promise, or as conditional on economic developments. Central banks' decisions on changes in their securities holdings also have many more dimensions than decisions on one or more policy rates. Securities have many different maturities, different issuers, are associated with different risks and so on. It is therefore not as easy to present plans for securities holdings as for interest rate decisions. Moreover, the public is not obviously as interested in information on the central bank's securities transactions as it is in interest rate decisions. However, it is common for central banks to publish at least rough plans for changing their securities holdings. The Riksbank, for example, has been doing this for several years.

To summarise, monetary policy in practice is of course much more than how a central bank formulates rules for setting interest rates and other instruments at its disposal. How the central bank justifies its decisions and communicates about them can also affect the fulfilment of the objectives. It is also natural that both the design of the regulatory framework and communication change over time, given that the central bank operates in and through the ever-changing financial system.

6 Conclusion

Monetary policy is not just about setting an interest rate. In this article, we have provided a broader picture of the central bank's tasks and toolkit. For example, sometimes a central bank needs to buy or sell securities and provide loans at longer maturities and with different counterparties and conditions than normal, in order to stabilise the financial system and the wider economy. Thus, the combination and design of instruments and counterparties over time depends, inter alia, on the conditions in the financial system.

We have highlighted how central banks and especially the Riksbank implement monetary policy in practice. As the banks' bank, the central bank must ensure that the supply of money and credit to companies and households runs smoothly and promotes sound and stable economic development. Therefore, formulations of the objectives and tasks of central banks often include arguments about price stability, stable and high levels of output and employment, and the stability and efficiency of both the payment system and the financial system in general. To achieve these objectives, central banks have several tools on their balance sheets to put monetary policy and financial stability decisions into practice.

What all central banks have in common is that they need to be able to conduct various financial transactions with participants in the financial system. However, financial system conditions differ across countries, and they also change over time. This affects the tools central banks choose to use to fulfil their tasks. As the environment is constantly changing, central banks need some guiding principles when designing their frameworks and systems for implementing monetary policy. In this way, they will hopefully be able to carry out their tasks effectively even in conditions that could not be known in advance. We have reviewed a number of guiding principles and considerations that central banks need to take into account when designing their operational frameworks. Although central banks have to deal with financial systems that exhibit structural differences over time and across currency areas, all central banks normally focus on steering the shortest interest rate in the overnight market for interbank loans. More information on this is provided in the other articles in this special issue.

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