Central banks' operational frameworks – an international perspective and comparison

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Central banks use monetary policy operational frameworks to influence short-term market interest rates and thereby implement the decided level of their policy rates in the market. Although the core task of these operational frameworks is largely the same for the vast majority of central banks, they are designed and implemented in a variety of ways. Whilst there are a number of main types of operational framework with common basic features, in practice they can be quite different. In this article, we describe the operational frameworks of fourteen central banks and discuss the differences and similarities between them.

1 Introduction

It is through the monetary policy operational framework that a central bank puts its monetary policy into practice. The central bank conducts, or offers to conduct, financial transactions on a repeated basis in order to establish the level of its main policy rate in the money markets. The monetary policy operational framework is an umbrella term for these transactions and the terms and conditions associated with them.

However, the way central banks design their operational frameworks varies. These differences are largely due to the fact that central banks adapt their respective operational frameworks to local conditions, such as legislation, the structure of payment systems and financial markets, and monetary policy objectives. Differences between operational frameworks may also reflect differences in how central banks

* The authors would like to thank a number of people at the central banks discussed in this article. They have provided us with invaluable assistance by conducting factual reviews and answering questions, large and small, about their respective operational frameworks. Any remaining errors are entirely our own. Thanks to Michael Thornley (Reserve Bank of Australia), Sabrina Wu (Bank of Canada), Petr Frydrych (Česká národní banka), Kristine Rasmussen (Danmarks Nationalbank), Tom Hudepohl (European Central Bank), Csaba Csávás (Magyar Nemzeti Bank), Björgvin Sighvatsson (Seðlabanki Íslands), Mahia Pepper (Reserve Bank of New Zealand), Knut Kolvig (Norges Bank), Pawel Kowalewski (Narodowy Bank Polski), Florian Böser (Swiss National Bank), James Howat (Bank of England) and Halim Abourachid (Federal Reserve System), as well as their respective colleagues where appropriate. In addition, we would like to thank Heidi Elmér, Jens Iversen, Per Åsberg Sommar, Ulf Söderström and Marianne Nessén for valuable comments on the article, as well as Caroline Jungner and Gary Watson for clear language review and English translation respectively. The opinions expressed in the article are those of the authors and are not to be seen as the Riksbank's position.

view their impact on financial markets. These differences may relate to issues such as the perception of the central bank's role in incentivising interbank activity or in facilitating banks' compliance with their regulatory liquidity requirements.

In 2019-2022, Sveriges Riksbank reformed its operational framework.[1] Other central banks have also made significant changes in the way they implement monetary policy in recent years. This can partly be seen as a response to large liquidity surpluses in the wake of significant central bank purchases of financial assets. Most central banks also started to tighten monetary policy from 2022 onwards. It is therefore interesting to take a look at mid-year 2023 to study different central banks' operational frameworks at this point. The purpose of this article is therefore to provide an overview of a selection of central banks and their operational frameworks at this point in time, and to highlight key similarities and differences between them.[2]

Studying the operational frameworks of other central banks is valuable for a central bank, both to facilitate the evaluation of its own operational framework and to learn lessons from other central banks. It is useful for outsiders to study the design of different central banks' operational frameworks in order to understand, for example, why the central banks in question conducts or offer to conduct the transactions they do, why they sometimes act in similar ways and why they sometimes act in completely different ways.

Section 2 describes, at a conceptual level, how operational frameworks are usually designed. In Section 3, we summarise the operational frameworks of fourteen central banks. This section may prove useful as a reference work for various central banks' operational frameworks. For a more concise overview, go directly to Section 4, which summarises the differences and similarities between the operational frameworks. In Section 5, we provide some concluding remarks that look to the future.

2 Three main types of operational framework

Central banks may have different objectives for monetary policy, which is to say the most important task for their operations. Most commonly, central banks have some form of inflation target, meaning a price stability target. This means that the central bank aims to maintain a certain rate of change in the general price level. Another relatively common objective is an exchange rate target.[3] This means that the central bank aims to stabilise the value of the domestic currency against another dominant currency or basket of currencies. As a complement to these overall monetary policy objectives, it is also common for central banks to have more or less explicit real

[1] See Hansson and Wallin Johansson (2023) for a description of the Riksbank's reformed operational framework and an account of the motives and considerations behind the current design.

[2] Due to the fact that the Hungarian central bank, Magyar Nemzeti Bank, implemented a number of major reforms to its operational framework in September 2023, its operational framework is described on the basis of its status on 1 October 2023.

[3] Of the central banks studied in this article, only Danmarks Nationalbank has an exchange rate target as the overall objective of monetary policy.

economic targets and the objective of promoting an efficient payment system and financial stability.

The monetary policy operational framework is used to influence short-term market interest rates in a way that helps the central bank achieve its monetary policy objective. Regardless of the overall monetary policy objective, central banks usually decide on the level of one or more main policy rates. These signal the level of interest rates that the central bank expects to lead to the most favourable outcome based on its objectives and mandate. The operational framework is used to establish this level of interest rates in the most short-term money markets. This represents the first step in the monetary policy transmission from the policy rate to the broader economy. The money market interest rates to which the central bank attaches the greatest importance, and the level at which it intends to stabilise them, are usually specified in a so-called **operational objective** for the framework.

Central bank operational frameworks can broadly be categorised into three different types: corridor systems, floor systems and quota systems. We describe these three main types below. An important concept in this context is 'monetary policy counterparty'. This refers to the market participants with which the central bank can conduct transactions within the operational framework.

2.1 Corridor systems

A corridor system is characterised by the central bank stabilising market rates within the interest rate corridor of the operational framework. The interest rate corridor consists of the central bank's overnight deposit and lending rates. The central bank's main policy rate is usually in the centre of the corridor with the same distance to the deposit rate as to the lending rate. Central banks with corridor systems usually aim to stabilise market interest rates in the middle of the corridor, at the level of the main policy rate.

If the liquidity position of the banking system vis-à-vis the central bank is reasonably well balanced, it can be expected that some counterparties will have a liquidity surplus at the end of the day and others a liquidity deficit. This means that some counterparties have a deposit need while others have a borrowing need. A central bank usually applies different interest rates for deposits and loans. The interest rate for loans is usually higher than the interest rate for deposits. In this way, the difference between the central bank's deposit and lending rates creates an incentive for counterparties to balance liquidity with each other in the market at an interest rate that falls between the interest rate they would have paid or received if they had instead borrowed or deposited liquidity with the central bank. This causes the overnight market rate to stabilise in the middle of the corridor.

If the banking system is not in balance from the start, the central bank can temporarily balance the system by either draining or injecting liquidity through market operations. This means that the corridor system also works when the banking system has a structural liquidity surplus or deficit, in addition to when it is in balance. An operational framework with these characteristics is said to be universal, which is a key feature of corridor systems. At the same time, it requires the central bank to have the ability to drain the right amount of liquidity from the banking system, or add the right amount to it, which presupposes that the central bank can adequately forecast the liquidity position of the banking system.

As a central bank with a corridor system does not need to maintain a liquidity surplus for the smooth functioning of the operational framework, it is also not necessary for it to have a large balance sheet. The corridor system can therefore help to make the central bank's balance sheet, and hence its equity, less sensitive to market movements. This means that the corridor system is associated with less financial risk for the central bank than other types of operational framework.[4]

A key parameter in the design of a corridor system is the corridor width, meaning the difference between the central bank's overnight deposit and lending rates. This choice can differ significantly across central banks and is mainly a trade-off between limiting volatility in the overnight market on the one hand and stimulating interbank activity on the other. A narrower corridor reduces the volatility of the overnight rate, as the central bank's deposit and lending rates limit movements in the overnight rate. At the same time, the incentives for interbank activity are reduced as the cost saving or gain to counterparties from liquidity balancing in the market rather than with the central bank, is smaller for a narrow corridor (Bindseil and Jablecki, 2011). Less interbank activity also means that the central bank is more involved in the markets. Similarly, counterparties' incentives to seek market solutions in a wide corridor are strengthened, while movements in the overnight rate risk becoming larger.

2.2 Floor systems

Floor systems are characterised by the central bank stabilising market rates at the floor of the interest rate corridor, which is the central bank's overnight deposit rate. In floor systems, the deposit rate is usually the same as the main policy rate.

Central banks with floor systems provide ample access to liquidity for their counterparties. This means that their counterparties have a need to deposit liquidity overnight. As all counterparties generally share this deposit need, most counterparties turn to the central bank rather than the market to deposit liquidity overnight. This pushes the overnight rate down to the same interest-rate level offered by the central bank for deposits.

In a well-implemented floor system, one in which the central bank ensures that there is always a significant surplus of liquidity, short-term market rates can be expected to be less volatile than in a corridor system, for example. At the same time, all liquidity

[4] This does not mean that central banks using corridor systems are automatically only exposed to insignificant financial risk, but rather that the operational framework itself does not require the central bank to have a large balance sheet that exposes the central bank to greater financial risk. See Caruana (2011) for a discussion of this, as well as four additional risks that a large balance sheet (risk of inflation, risk to financial stability, risk to market functioning and risk to government debt management) may entail. See also Borio (2023) for a similar discussion.

balancing can be expected to take place with the central bank, which means that the incentives for an active interbank market are usually weak in a floor system.

With a floor system, the central bank does not need to have a good forecasting ability for daily liquidity flows, as it may need with a corridor system. On the other hand, the central bank needs to be good at forecasting the banking system's demand for central bank reserves so that it can ensure that there is always a surplus of these reserves. The central bank can deal with this in two different ways, with a distinction being made between two different types of floor systems: demand-driven and supply-driven. A demand-driven system is characterised by the central bank providing the amount of central bank reserves the counterparties demand. A supply-driven system is characterised by the central bank instead providing the amount it deems sufficient. In both cases, counterparties can usually access central bank reserves at a low cost.

Floor systems have become more common over the last 15 years as many central banks have carried out large-scale asset purchases.[5] Indeed, floor systems can easily manage a growing liquidity surplus. At the same time, a central bank with a large balance sheet is typically exposed to greater financial risks than a central bank with a small balance sheet.[6] There is also a risk that the central bank may affect the demand for liquidity in the banking system more fundamentally by maintaining a large liquidity surplus for an extended period (Acharya et al. 2022). In turn, this means that a central bank with a floor system may find it difficult to reduce the liquidity surplus of the banking system. In addition, a floor system may also create a conflict of objectives for the central bank if it wants to pursue a contractionary monetary policy, as it requires a sufficiently large liquidity surplus in all cases.

2.3 Quota systems

Quota systems are characterised by the central bank stabilising market rates within the interest rate corridor of the operational framework and by there being two different interest rates for deposits in the central bank. Counterparties receive a favourable interest rate, usually equivalent to the central bank's main policy rate, for a certain volume that they deposit with the central bank, known as the quota. The quota is determined for each monetary policy counterparty, usually on the basis of a balance sheet measure. Deposits exceeding this quota receive a less favourable interest rate. Often the difference in interest rates is significant.

The quota rate is usually in the centre of the interest rate corridor formed by the central bank's deposit and lending rates. This means that the counterparties in a quota system have an incentive to engage in liquidity balancing transactions with each other in the market, so that all counterparties meet their quotas and can thus fully benefit from the more favourable interest rate. Quota systems can thus create incentives for financial agents to seek market solutions for their liquidity management

[5] See, for example, Borio (2023) for a discussion of the trend towards more central banks having floor systems and the consequences of this.

[6] See, for example, Caruana (2011).

and thus contribute to a more active interbank market.[7] This makes the counterparties' incentive structure similar to that of a corridor system.

Quota systems also have several similarities to floor systems. A basic condition for a quota system to work as intended is that the central bank maintains a surplus of liquidity. If the aggregate liquidity surplus exceeds the sum of the quotas, the excess volumes will receive the less favourable deposit rate. This means that the deposit rate constitutes marginal pricing for liquid assets, thereby setting the tone for interest-rate formation and the further transmission of monetary policy. This mechanism is similar to a floor system. By applying a quota system, the central bank can thus be generous with the remuneration of counterparties holding central bank reserves while maintaining good interest-rate steering. This made quota systems more common during the period of negative interest rates and large liquidity surpluses.[8,9]

There are some common differences between how central banks apply quota systems. They mainly concern the size of the quota, how its size is determined and the difference between the interest rate on quota deposits and the interest rate on other deposits. Setting quotas is usually a resource-intensive activity. Among other things, it requires the central bank to forecast counterparties' demand for liquidity and the overall liquidity surplus. There is also always an element of arbitrariness when the central bank decides on the level of quotas.

Several central banks apply reserve requirements, which sometimes resemble quota systems. Reserve requirements mean that counterparties must deposit a certain amount of liquidity with the central bank. In some cases, reserve holdings accrue interest according to the same principle as the quota in a quota system, i.e. they receive a more favourable interest rate than other deposits. There are, however, significant differences between quota systems and reserve requirements. The purpose of reserve requirements is not always monetary policy, which may mean that reserve holdings receive less interest than other deposits at the central bank or none at all. It is also not uncommon for monetary policy counterparties to be penalised if they do not comply with reserve requirements. This is not the case in a quota system, which instead is usually based on incentives. Moreover, the amount of central bank reserves that counterparties have to hold under a reserve requirement is typically smaller than those that may be held at a better rate under a quota system.

[7] See, for example, Altavilla et al. (2022).

[8] Note that several central banks referred to this as tiering rather than explicitly labelling their operational frameworks as quota systems.

[9] In many countries, this period coincided with concerns about the profitability and stability of the banking system. For interest-rate formation, it is primarily the return on the last krona, marginal pricing, that matters, while for the banks' return on deposits with the central bank, it is the average interest rate that is decisive. This means, for example, that a quota deposit with generous interest rates, such as a zero interest rate, improves the banks' profitability if the interest rate on excess deposits is negative. At the same time, it is the interest rate on the margin, which is negative that is transmitted to the short-term money market.

3 Monetary policy operational frameworks in selected jurisdictions

In Section 2, we described the basics of three main types of operational framework. In practice, however, operational frameworks can be designed in a variety of ways and it is not uncommon for operational frameworks to have elements that resemble more than one of the main types. As a result, it can be difficult to classify a central bank's operational framework according to the three main types. In order to understand how different central banks implement monetary policy in practice, it may therefore be more useful to describe and analyse the operational framework in terms of its three components. They are the **instruments** offered in the operational framework, the **counterparties** allowed to participate and the **collateral** accepted by the central bank for credit granting. In the following sections, we therefore describe the operational frameworks of fourteen central banks in terms of these three elements.

However, before examining each central bank's operational framework, it is useful to mention how we classify the different components of the operational framework.

The first component, the central bank's monetary policy **instruments***,* is divided into standing facilities and market operations. **Standing facilities** are those instruments that can be used on a daily basis at the discretion of the counterparties, to an unlimited extent and under pre-specified conditions. They can be used either continuously during the day or as the money markets close. The duration of the facilities is usually only overnight. **Market operations**, on the other hand, are initiated by the central bank itself and are usually offered on a limited scale. They can have a maturity from overnight to several months, which means that market operations can be used to influence the liquidity position of the banking system vis-à-vis the central bank over a longer period of time.

The boundary between market operations and standing facilities can sometimes be somewhat blurred. For example, the name of an instrument may imply that it is a standing facility, even though its characteristics instead indicate that it is a frequently recurring market operation. In this article, we will classify the monetary policy instruments according to their characteristics, regardless of their name. Furthermore, it is worth noting that, while a large number of central banks use interest-bearing accounts as a monetary policy instrument, some central banks do not consider such accounts as a standing facility.[10] In this article, however, we will classify interest-bearing accounts at the central bank as standing facilities.

There is variation in whether central banks refer to their potential repo operations and repo facilities from the perspective of the counterparty or the central bank. For the sake of clarity, we will therefore use the term 'repo transaction' throughout, as well as the short form 'repo', and will specify whether these are used to absorb or provide liquidity to the banking system.

[10] These central banks reserve the term standing facility for their lending facilities. An example of a central bank that makes this distinction is the Swiss National Bank.

The vast majority of central banks have a wide set of instruments that they can use as part of their monetary policy operational frameworks. However, it is rare that a central bank applies all instruments simultaneously. The instruments used by the central bank usually depend on the structural liquidity position of the banking system towards it. Consequently, in order to provide a picture of the operational frameworks as they are actually applied, when describing the central banks' operational frameworks, we will only report on the instruments regularly offered by the central banks at mid-year 2023.[11] In addition, we focus on how central banks control short-term market rates – money market rates – and steer them towards their respective main policy rates. We thus do not go into detail as to whether central banks buy and sell financial assets to influence longer-term market interest rates, for example. We also do not report on the instruments offered by central banks for market-functioning or financial stability purposes, as central banks' mandates vary greatly in these areas.[12]

The second element of a operational framework is the central bank's **set of counterparties** and how it is organised. To simplify the comparison between central banks, we classify these as either narrow or wide. However, determining whether the criteria applied by the central bank to its monetary policy counterparties in the operational framework are wide or narrow is not straightforward. In this article, we define a set of counterparties as narrow if it can only consist of credit institutions. This includes institutions such as banks, savings banks and mortgage institutions. If additional agents, such as central counterparties, money market funds, investment funds and pension funds, can participate in the operational framework, we instead consider the set of counterparties to be wide.

The third element is the **collateral** that the central bank accepts to grant credit. In the same way that we classify the set of counterparties as narrow or wide, we classify the collateral pool as narrow or wide. We assess the collateral pool as narrow if one or both of the following criteria are met:

i) The central bank only accepts securities in its own currency.
ii) The central bank only accepts government bonds and equivalent debt instruments.[13]

It could be argued that this is a rough measure depending on the size and depth of local bond markets but it allows us to draw a simple boundary without subjective elements: if the accepted collateral pool is not judged to be narrow, it is automatically judged to be wide.

In this comparison, we have chosen mainly to include European central banks. In addition to the European Central Bank, we include the central banks of those EU

[11] In September 2023, Magyar Nemzeti Bank decided to implement a number of major changes to its operational framework. The vast majority of these changes were implemented between 27 September and 1 October 2023. We therefore present this operational framework as it stood on 1 October 2023.

[12] We also exclude those facilities and market operations that are directed only at foreign central banks and similar entities, such as the Foreign and International Monetary Authorities (FIMA) Repo Facility offered by the Federal Reserve.

[13] This includes subnational bonds in countries with a federal structure, as well as claims on central banks.

countries that, like Sweden, are not currently officially working towards adopting the euro as their currency.[14] In addition, the central banks of Iceland, Norway, Switzerland and the United Kingdom are also included in our sample. We also choose to study the operational frameworks in the United States and in three other non-European countries whose central banks are often compared to Sweden's, namely Australia, Canada and New Zealand. This means that we study the operational frameworks in the same countries as Sellin and Åsberg Sommar (2014) with the difference that we have added Denmark and Iceland to include all the Nordic central banks in our sample. With one exception, all of the fourteen central banks we study have an overall monetary policy objective of price stability. The exception is Denmark, which has an exchange rate target.

Our description of the central banks' operational frameworks is intended to be used as a reference work. Section 4 discusses the differences and similarities between the operational frameworks. In that section there are also summary tables of the information given in Section 3.

3.1 Australia – Reserve Bank of Australia (RBA)

The objective of the RBA's operational framework is to stabilise the interest rate on unsecured overnight interbank loans, referred to as the cash rate, close to the central bank's cash rate target.[15] The cash rate target is the RBA's main policy rate.

The RBA uses a floor system to implement its monetary policy and also characterises its operational framework as such. To ensure the smooth functioning of the payment system, the RBA also applies minimum reserve requirements.

3.1.1 Instruments

Standing facilities, available to some monetary policy counterparties

Account balances with the central bank, that is central bank reserves, earn interest at a level 10 basis points below the RBA's cash rate target. Overnight lending is offered through repo transactions against accepted collateral. There is no upper limit on lending, which takes place at an interest rate 25 basis points above the cash rate target.

Reserve holdings earn the same interest as the other central bank reserves, that is an interest 10 basis points below the cash rate target.

Unlimited and interest-free intraday credit is offered in the form of repos against approved collateral in the payment system.

Market operations, available to all monetary policy counterparties

[14] This means that the central banks of Denmark, Poland, the Czech Republic and Hungary are included in our sample, while the central banks of Bulgaria and Romania are not included, as the official policy in these countries is to endeavour to adopt the euro as their currency.

[15] In the market, this rate is known as AOINA (AUD Overnight Index Average).

In addition to the standing facilities, the RBA offers weekly market operations to provide liquidity to the banking system. Market operations are conducted in the form of repo transactions and have a maturity of 28 days. The RBA sets a lower bound for accepted bids and accepts all bids at or above this rate with full allocation. The lower bound corresponds to the interest rate for overnight index swaps (OIS) with the same maturity as the repo transaction plus a surcharge which is currently 5 basis points.

In addition, the RBA offers daily liquidity-providing repo transactions with no maturity restrictions to those counterparties subject to reserve requirements. This market operation is mainly used to facilitate the fulfilment of counterparties' reserve requirements and the interest rate corresponds to the rate earned on central bank reserves.

3.1.2 Counterparties

We classify the RBA's set of counterparties in its operational framework as wide because the central bank allows more types of agents than credit institutions as counterparties. For example, eligible companies include banks, building societies, credit unions and central counterparties. To be eligible to participate in the operational framework, counterparties must participate in the RITS central payment system and the Austraclear securities settlement system, among others. In addition, they need to be adequately supervised and able to ensure efficient and timely processing of transactions.

Counterparties that are direct or indirect members of RITS have access to the domestic market operations. Counterparties that are direct members of RITS, and thus hold accounts there, also have access to the standing facilities. On 30 June 2023, the RBA had 161 counterparties, meaning members of RITS, of which 98 were direct participants and held accounts. Of the 98 direct participants, the majority were banks, building societies and credit unions.

3.1.3 Collateral

According to our classification, the RBA accepts a narrow collateral pool for its lending. This is because it only accepts collateral in the form of securities denominated in Australian dollars and issued under Australian law. Government bonds, covered bonds, commercial paper and bonds, and other securities are accepted, as long as they fulfil requirements for credit ratings, for example. The RBA imposes the same collateral requirements for standing facilities and market operations.

3.2 Canada - Bank of Canada (BoC)

The objective of the BoC's operational framework is to stabilise overnight money market rates close to the central bank's target rate. In practice, this is assessed by looking at CORRA, the Canadian Overnight Repo Rate Average, which is a secured overnight reference rate. The target rate is the BoC's main policy rate. For its monetary policy operational framework, the BoC uses a floor system. The BoC also explicitly classifies its operational framework as a floor system.

3.2.1 Instruments

Standing facilities, available to some monetary policy counterparties

Account balances at the central bank, which is to say deposits, receive the deposit rate, which is equal to the current target rate. Unlimited overnight credit is available through the standing liquidity facility against eligible collateral at an interest rate of 25 basis points above the target rate, known as the bank rate.

Within the payment system, interest-free intraday credit is offered against all eligible collateral, without limit.

Market operations, available to some monetary policy counterparties

When it comes to market operations, the BoC offers daily overnight repos of both the liquidity-providing and liquidity-absorbing varieties.[16] The repos offered to provide liquidity are priced through an auction procedure with the target rate as the minimum interest rate. Repos offered to absorb liquidity are conducted at a fixed rate equal to the target rate.[17] In addition, the BoC offers a standing repo facility at bank rate to provide liquidity.[18]

3.2.2 Counterparties

We classify the BoC's set of counterparties as wide, as the eligibility requirements do not limit it to credit institutions. Currently, however, all monetary policy counterparties are banks or are affiliated with banks. Nevertheless, different types of participant have access to different monetary policy instruments. Some counterparties have access to standing facilities while others have access to market operations.

Direct members of the Lynx central payment system have access to interest-bearing accounts at the BoC and the standing liquidity facility. Possible members are banks with domestic banking licences, branches of some foreign banks and other financial institutions. On 12 June 2023, there were 16 direct members of Lynx.

Canadian primary dealers have access to the standing repo facility and other market operations. On 12 June 2023, there were eleven such dealers.

3.2.3 Collateral

The BoC accepts different collateral for its different monetary policy instruments. In market operations, only securities issued by the Canadian government in Canadian dollars are accepted, which is a narrow collateral pool according to our definition. The

[16] These operations are scheduled daily and executed through established programmes but, as allocation ultimately takes place at the discretion of the BoC, we classify them as market operations and not as standing facilities.

[17] Overnight liquidity-providing repos are offered in a limited volume and are allotted through a uniform-price auction procedure. Liquidity-absorbing repos are conducted on a full allotment basis and against securities issued by the Canadian government in Canadian dollars.

[18] As lending is subject to counterparty limits, we choose to classify it as a regular market operation instead of a standing facility.

standing liquidity facility accepts a number of different types of securities and loan portfolios, subject to strict currency restrictions and credit rating requirements. Although we classify the accepted collateral pool for the standing facility as wide, it should be noted that the collateral must be denominated in Canadian or US dollars. In addition, the BoC applies stricter rules for securities accepted in US dollars. Intraday credit is offered against all eligible collateral.

3.3 Czech Republic - Česká národní banka (CNB)

The CNB's main policy rate is the rate for repos with a two-week maturity, henceforth referred to as the two-week repo rate. The CNB does not specify an explicit operational objective for its operational framework. Nor does it classify its operational framework as one of the three main types discussed in Section 2. However, we consider that their operational framework has the greatest resemblance to a corridor system. The corridor is symmetrical and has a width of 200 basis points. The CNB applies reserve requirements but their purpose is not monetary policy.[19]

3.3.1 Instruments

Standing facilities, available to some monetary policy counterparties

The CNB applies reserve requirements to certain counterparties. These funds earn interest at the two-week repo rate.[20] Counterparties have the possibility to deposit central bank reserves in excess of this level in the central bank's deposit facility.[21] The interest rate on the deposit facility, the discount rate, is 100 basis points below the two-week repo rate. Overnight lending is offered against accepted collateral in the lending facility. The interest rate of the facility is called the Lombard rate and is 100 basis points above the two-week repo rate. The discount rate and the Lombard rate constitute the floor and ceiling of the interest rate corridor.

Unlimited interest-free intraday credit is offered against eligible collateral in the payment system.

Market operations, available to all monetary policy counterparties

Three times a week, the CNB offers market operations in the form of liquidity-absorbing repos with a two-week maturity. The operations are conducted as variable rate bid procedures with the two-week repo rate as the upper bound for acceptable bids. The offered volume corresponds to the forecast of the total liquidity surplus for the day.

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[19] The reserve requirement is used to support the payment system. The level of the reserve requirement is set at 2 per cent of the reserve base.

[20] As of 5 October 2023, the funds used to meet the reserve requirements do not bear interest.

[21] Excess central bank reserves are not automatically remunerated at the deposit rate, but require an active decision by the counterparty. Excess central bank reserves remaining in the account are remunerated at 0 per cent.

In addition, the CNB offers weekly liquidity-providing repos with a maturity of two weeks.[22] The central bank offers these for both monetary policy and financial stability reasons. Provided that counterparties provide sufficient collateral, they can borrow an unlimited volume in these repo transactions. The interest rate is fixed but differentiated between counterparties. The interest rate is set 10 basis points above the two-week repo rate for banks and 20 basis points above the two-week repo rate for non-bank counterparties.

3.3.2 Counterparties

We classify the CNB's counterparty base as wide, although access to the different instruments of the operational framework is segmented. Counterparties subject to reserve requirements, such as banks, foreign bank branches and credit unions, have access to all instruments. Non-bank counterparties, such as insurance companies, pension funds and fund management companies, only have access to liquidity-providing market operations. On 30 June 2023, 47 counterparties were subject to reserve requirement. 33 of them had the relevant agreement for lending.

3.3.3 Collateral[23]

According to our classification, the CNB accepts a narrow collateral pool in its lending facility and market operations, as only koruna-denominated collateral is accepted. In market operations, the CNB also accepts different collateral from different types of counterparties. From banks, branches of foreign banks and credit unions the CNB accepts government bonds, treasury bills, bills issued by the CNB and mortgage bonds. From other eligible counterparties, only government bonds, treasury bills and bills issued by the CNB are accepted.

3.4 Denmark – Danmarks Nationalbank (DN)

Unlike most central banks in our sample, DN has an exchange rate target.[24] The operational objective of DN's framework is therefore to ensure that the peg of the Danish krone to the euro holds. However, in order to achieve this objective, DN aims to steer short-term market rates, which is similar to the other central banks in our sample. The target level for these money market rates is the level that maintains the peg.

DN classifies its operational framework as a corridor system but recognises that it can resemble a floor system when there is an ample amount of central bank reserves in the system. The width of the central bank's corridor is 15 basis points. Because the target level for short-term market interest rates varies over time, the interest rate that DN classifies as the main policy rate also varies over time. Depending on the amount of central bank reserves, either the deposit or lending rate is considered the

[22] The market operation is offered twice a week, but to different counterparty pools. Consequently, a single counterparty can only participate in the market operation on one occasion.

[23] Upon request, the CNB also offers what is known as a collateral upgrade swap.

[24] While DN also aims to achieve price stability, it considers that this is best achieved through a monetary policy that ensures that the value of the Danish krone stabilises against the euro.

main policy rate.[25] At the time of writing this article, i.e. in the summer of 2023, the deposit rate is judged to be the most important interest rate.

3.4.1 Instruments

Standing facilities, available to all monetary policy counterparties

Balances on so-called 'folio accounts' are remunerated at the deposit rate. The deposit rate is the floor of the interest rate corridor. There is no standing lending facility.

In the central payment system, DN offers unlimited interest-free intraday credit against collateral.

Market operations, available to all monetary policy counterparties

The ceiling of the DN interest rate corridor is not an overnight lending facility. Instead, DN offers weekly lending, normally with a one-week maturity, via market operations. Only the value of the collateral pledged by the counterparties limits the amount they can borrow. The lending rate is 15 basis points above the deposit rate. DN also offers weekly liquidity-absorbing open market operations with a one-week maturity. In these operations, counterparties are offered the possibility of placing an unlimited volume in certificates of deposit issued by DN. The interest rate is fixed and equal to the deposit rate.[26]

3.4.2 Counterparties

DN has one monetary policy counterparty group for all its operations in Danish kroner. By our definition, the counterparty group is narrow as only banks and mortgage institutions are eligible. DN had 69 monetary policy counterparties on 30 June 2023. Of these, 64 were banks and 5 housing institutions.

3.4.3 Collateral

Although DN's accepted collateral pool is classified as wide according to our criteria, as non-government bonds are accepted as well as securities not denominated in DKK, the accepted collateral pool is still relatively narrow. Apart from Danish kroner, only securities denominated in euro are accepted. The eligible collateral consists of Danish and Faroese government bonds, including government-guaranteed bonds, bonds issued by Kommunekredit and mortgage bonds, covered bonds and covered mortgage bonds issued by institutions subject to the Danish Financial Business Act.

[25] If the net position of the banking system is large, DESTR (Denmark Short-Term Rate) is likely to trade close to the floor of the corridor and the deposit rate is then considered the main policy rate.

[26] Certificates of deposit are securities that are transferable between monetary policy counterparties, but not outside this pool. The interest rate on certificates of deposit was changed to the deposit rate in 2021 and has since been utilised to a limited extent.

3.5 Euro area – European Central Bank (ECB)

The ECB has three main policy rates: the deposit facility rate, the main refinancing rate and the marginal lending facility rate. The three main policy rates are communicated as three separate decisions. The ECB has no officially stated operational objective for its monetary policy operational framework. However, based on various descriptions of the framework and speeches by members of the Governing Council, it is clear that the aim is to stabilise short-term money market rates close to the main policy rates. The liquidity surplus is currently high, and the aim is therefore to steer short-term money market rates towards the deposit rate.[27]

While the ECB does not classify its operational framework as one of the main types discussed in Section 2, our assessment is that it shares most similarities with a floor system. It is also worth noting that Isabel Schnabel, a member of the ECB's Governing Council, referred to the operational framework as a floor system in a speech on 27 March 2023.[28] The ECB applies reserve requirements to credit institutions established in the euro area, as described below.[29]

3.5.1 Instruments

Standing facilities, available to all monetary policy counterparties

The ECB offers overnight deposits through a standing deposit facility. The funds counterparties place in the facility, as well as the funds they hold to fulfil reserve requirements, earn the deposit facility rate.[30] The deposit facility rate is the lowest of the three main policy rates. In addition, the ECB offers overnight collateralised credit through its marginal lending facility, at the marginal lending facility rate. This rate is the highest of the three main policy rates and is currently 75 basis points above the deposit facility rate.

Unlimited, interest-free intraday credit is offered within the payment system against accepted collateral.

Market operations, available to all monetary policy counterparties

The ECB offers two regular market operations: the main refinancing operations and the longer-term refinancing operations. Both are liquidity-providing. The main refinancing operations are regular reverse transactions with a maturity of one week. The market operation is offered weekly and has no volume limit. Lending is collateralised and the interest rate on the operations, i.e. the main refinancing rate, is

[27] See for example Corsi and Mudde (2022).

[28] Schnabel (2023).

[29] The ECB applies an average reserve requirement. The level of the reserve requirement is 1 per cent of the reserve base i.e. certain specific liability items.

[30] The ECB requires credit institutions established in the euro area to hold a certain amount of central bank reserves on account with their respective national central banks, i.e. a reserve requirement. These central bank reserves earned interest equivalent to the deposit facility rate in the summer of 2023. However, from 20 September 2023 onwards, reserve holdings have earned 0 per cent interest.

currently 50 basis points above the deposit facility rate and 25 basis points below the marginal lending facility rate.

The longer-term refinancing operations are offered in a similar way. The main difference is that these operations have a maturity of three months and are only offered once a month. The operations are offered in full allotment and as reverse transactions at a fixed rate corresponding to the average main refinancing rate over the maturity period.

3.5.2 Counterparties

The ECB has one set of counterparties for its monetary policy instruments. Eligible counterparties are credit institutions subject to adequate supervision and subject to Eurosystem reserve requirements. This means that we characterise the ECB's set of counterparties as narrow, even though it is relatively large in terms of the number of counterparties. The ECB does not publish information on the exact number of counterparties, but according to Corsi and Mudde (2022) the ECB had 1,869 monetary policy counterparties at the end of 2021.

3.5.3 Collateral

The ECB accepts a wide collateral pool for lending in facilities and market operations. Acceptable collateral includes, for example, government bonds, covered bonds and other bank bonds, asset-backed securities and, to a limited extent, non-marketable assets and cash. The securities may be issued by agents domiciled in one out of several accepted countries and be denominated in one out of several accepted currencies.

3.6 Hungary - Magyar Nemzeti Bank (MNB)

In September 2023, the Executive Board of the MNB decided to implement several changes to its monetary policy operational framework.[31] The vast majority of changes were implemented between 27 September and 1 October 2023. Because of this, we describe the MNB's monetary policy framework as it was on 1 October 2023 instead of 30 June 2023.

The main policy rate of the MNB is the so-called base rate. The operational objective of the MNB's monetary policy operational framework is to align short-term market interest rates with the base rate and expectations of it. The MNB does not classify its operational framework as one of the main types discussed in Section 2, but our assessment is that it shares most similarities with a corridor system. On 1 October 2023, their corridor is 200 basis points wide.[32] Domestic banks are subject to reserve requirements, see below.

[31] The changes were decided on two occasions, on 12 and 26 September.

[32] The width of the corridor has been gradually reduced since May 2023. Before this, the width of the corridor was 1,250 basis points, i.e. 12.5 percentage points.

3.6.1 Instruments

Standing facilities, available to all monetary policy counterparties

A quarter of the central bank reserves held by counterparties to fulfil the reserve requirement are non-interest bearing and the remainder earn the base rate.[33] The central bank reserves held by counterparties in excess of reserve requirements are also remunerated at the base rate.

The MNB offers a standing deposit facility and a standing lending facility, both with an overnight maturity. Holdings in the deposit facility are remunerated at a rate 100 basis points below the base rate and constitute the floor of the MNB's interest rate corridor. Lending is offered against collateral without restriction at an interest rate that is currently 100 basis points above the base rate. This lending rate is the ceiling of the interest rate corridor.

Unlimited, interest-free intraday credit is offered within the payment system against accepted collateral.

Market operations, available to all monetary policy counterparties

The MNB issues discount bills to absorb liquidity. The maturity and frequency of issuance are set at the discretion of the MNB, but in general the bills are issued once a week and have a maturity of seven days. The bills are issued through an auction procedure at the central bank's base rate.

In addition, the MNB offers deposits with longer maturities and variable interest rates. The market operation is usually offered once a month in unlimited volume. The interest rate corresponds to the current base rate plus a supplement currently set at 0 basis points. The maturity can be up to six months but is usually set at one month.

On a daily basis, the MNB also offers, through tenders, overnight FX swaps (EUR/HUF) to inject euro liquidity into the banking system.[34] FX swaps are offered in limited volumes usually at variable rates where the MNB announces the maximum rate at which it will accept bids.

3.6.2 Counterparties

The MNB has one set of monetary policy counterparties for all its HUF instruments. As only credit institutions registered in Hungary, including Hungarian branches of foreign banks, are eligible to become counterparties, we classify the set of counterparties as narrow. Counterparties must be direct members of the central payment system VIBER or direct members of the clearing system for interbank transactions BKR.[35] On 30 June 2023 the MNB had approximately 30 counterparties.

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[33] Counterparties that fail to fulfil their reserve requirements are subject to a penalty interest rate equal to the central bank's base rate multiplied by 2.

[34] The transactions are settled the day after the tenders. The maturity is therefore T/N.

[35] To be eligible for debt instruments, counterparties must also have a collateral account with KELER (the Central Securities Depository).

3.6.3 Collateral

The MNB accepts a wide collateral pool for its monetary policy instruments. Eligible collateral includes securities and corporate receivables in a number of currencies, as well as fixed deposits with longer maturities (and variable interest rates) with the MNB.

3.7 Iceland - Seðlabanki Íslands (SI)

SI's main policy rate is the seven-day deposit rate.[36] The objective of SI's monetary policy framework is to stabilise interbank market rates close to this rate. SI classifies its operational framework as a corridor system, but with a floor. The corridor is asymmetric around the seven-day deposit rate and has a width of 200 basis points. SI also applies fixed non-interest-bearing reserve requirements. However, the reserve requirements have no monetary policy purpose.[37]

3.7.1 Instruments

Standing facilities, available to all monetary policy counterparties

SI offers its counterparties the possibility to both invest and borrow liquidity overnight. The two standing facilities are described by their characteristics and have no explicit names. The interest rate paid by SI on central bank reserves is called the deposit rate and is 25 basis points below the seven-day deposit rate. Loans are offered against eligible collateral without any volume limit at an interest rate of 175 basis points above the seven-day deposit rate. These deposit and lending rates constitute the floor and ceiling of SI's interest rate corridor.

Interest-free intraday credit is offered within the payment system against accepted collateral up to an individual volume limit.

Market operations, available to all monetary policy counterparties

Once a week, SI offers open market operations in the form of fixed deposits with a seven-day maturity to absorb liquidity. The fixed-term deposits are offered at the main policy rate, and in limited volumes. The allocation is done through an auction procedure.

3.7.2 Counterparties

SI has one group of monetary policy counterparties for all its operations in krónur. Those eligible to become counterparties are commercial banks, savings banks and Icelandic branches of foreign financial institutions. SI's set of counterparties is

[36] The main policy rate corresponds to the rate judged to have the largest impact on short market rates. Thus, the interest rate this represents may change over time. Since 2014, the seven-day deposit rate has been considered the main policy rate.

[37] The fixed non-interest-bearing reserve requirement amounts to 2 per cent of the reserve base. The main purpose of the reserve requirement is to reduce the central bank's costs of implementing monetary policy. The aim is thus not to influence the monetary policy stance.

therefore categorised as narrow according to our definition. On 30 June 2023 the SI had 9 counterparties. Of these, 4 were commercial banks and 5 savings banks.

3.7.3 Collateral

SI accepts a narrow collateral pool for lending in its operational framework. Only securities denominated in krónur are accepted. Eligible collateral is mainly bonds and bills issued by the Icelandic government, government-guaranteed securities, covered bonds and mortgage bond portfolios.[38]

3.8 New Zealand – Reserve Bank of New Zealand (RBNZ)

The RBNZ's main policy rate is the official cash rate. The objective of the RBNZ's monetary policy framework is to stabilise short-term market interest rates close to the official cash rate. The RBNZ uses a floor system to implement monetary policy and explicitly characterises its operational framework in this way.

3.8.1 Instruments

Standing facilities, available to all monetary policy counterparties

The RBNZ pays interest at the official cash rate on overnight deposits at the central bank. In addition, the RBNZ offers a standing repo facility that allows counterparties without an account at the central bank to deposit cash at an interest rate equal to the official cash rate minus 10 basis points.[39] The RBNZ offers overnight lending through a liquidity-providing repo facility. In the facility, counterparties can borrow an unlimited volume in exchange for eligible collateral at an interest rate of 25 basis points above the official cash rate.

There is no separate facility for intraday credit in the payment system. All payments must be settled in central bank reserves.

Market operations, available to all monetary policy counterparties

Two days a week, the RBNZ issues reserve bank bills with a maturity of 7 and 28 days in limited volumes to drain the banking system of liquidity. The bills are issued through an auction procedure and are priced at a maximum of the official cash rate, or the market-implied expected level of the official cash rate at longer maturities.

In addition, the RBNZ uses FX swaps and cross currency basis swaps (NZD/USD) to influence the amount of liquidity. If the purpose is to provide liquidity, the RBNZ conducts operations at or above the market-implied level of the official cash rate. If the aim is instead to drain liquidity, the transactions are conducted at or below the market-implied level of the official cash rate. Market operations are offered as

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[38] In the payment system, fixed deposits with the central bank can also be used as collateral.

[39] Unlike other liquidity-absorbing repo facilities in this review, the RBNZ's standing repo facility is limited only by the central bank's holding of collateral, i.e. there is no counterparty limit, for example. Therefore, we classify this repo facility as a standing facility. In addition, it is available close to market closure, which means that it is possible for counterparties to access it on their own initiative at the end of the day.

needed, but up to several times a day. Maturities range from one day to up to six months.

3.8.2 Counterparties

We classify the RBNZ's set of counterparties as wide because the eligibility requirements do not limit it to credit institutions. All direct participants in the Exchange Settlement Account System receive interest on their account balances at the official cash rate. These counterparties have the possibility to apply for access to the other standing facilities and market operations but do not have automatic access to them.[40] Other agents can also apply to become a counterparty. On 30 June 2023 the number of counterparties was between 20 and 30. In practice, most could access both standing facilities and all market operations.

3.8.3 Collateral

We classify the RNBZ's eligible collateral pool as narrow because only New Zealand dollar-denominated collateral is accepted for New Zealand dollar monetary policy instruments. However, both the standing lending facility and the open market operations accept a relatively wide pool of assets.

3.9 Norway - Norges Bank (NB)

The main policy rate of NB is the policy rate. The objective of NB's monetary policy framework is to stabilise short-term market interest rates close to the policy rate. NB uses a quota system with a corridor width of 200 basis points for its operational framework. NB explicitly categorises its operational framework as a quota system.

3.9.1 Instruments

Standing facilities, available to all monetary policy counterparties

NB offers a standing deposit facility and a standing lending facility. Deposits up to and including a threshold represented by the banks' individual quota are remunerated at the policy rate, while deposits above the quota are subject to the less favourable reserve rate. The quotas are determined on the basis of the overall liquidity position that NB deems appropriate.[41] The reserve rate is set 100 basis points below the policy rate and constitutes the floor of the corridor. Counterparties can borrow unlimited volumes overnight against eligible collateral in the standing facility. This facility is priced 100 basis points above the policy rate and constitutes the ceiling of the interest rate corridor.

[40] To be eligible for this, applicants must be financial institutions with a regular presence in the capital markets either as market participants or by providing infrastructure that contributes to the stability and efficiency of the New Zealand financial system. In general, institutions should have a credit rating within *investment grade,* that is, BBB- or better. To be accepted as a counterparty in FX swap transactions, counterparties must also have an ISDA agreement with the RBNZ.

[41] Banks are divided into three groups based on their total assets. All banks within each group receive the same quota. NB normally reviews the total quota volume and the distribution between banks twice a year.

Unlimited, interest-free intraday credit is offered within the payment system against accepted collateral.

Market operations, available to all monetary policy counterparties

NB conducts market operations as necessary to ensure that the volume of central bank reserves does not deviate from the targeted level. Due to fluctuations in the amount of central bank reserves, this happens relatively frequently.

When the NB drains liquidity in market operations, it issues certificates (F-deposits) and when it provides liquidity, it offers collateralised loans (F-loans). The offered volume and maturity are predetermined and set by NB. The allocation and the interest rate are set within the framework of an auction procedure.[42] In F-deposit auctions, the interest rate must be equal to, or lower than, the main policy rate. For F-loans, the interest rate must be equal to, or higher than, the main policy rate.

3.9.2 Counterparties

NB has one set of monetary policy counterparties for all its instruments in kroner. The set of counterparties is classified as narrow because only Norwegian banks, savings banks and Norwegian branches of foreign banks are eligible to become counterparties, provided that they are actively involved in payment and credit intermediation in Norway. On 30 June 2023, NB had approximately 115 counterparties.

3.9.3 Collateral

NB accepts a wide collateral pool. Provided that restrictions such as credit ratings are met, debt securities from issuers in Norway, EU/EEA countries and nine other countries are accepted. The collateral must be denominated in one of 11 recognised currencies.

The same collateral pool applies to all monetary policy lending and to intraday credit in the payment system.

3.10 Poland - Narodowy Bank Polski (NBP)

The main policy rate of the NBP is the so-called reference rate. The objective of the NBP's monetary policy operational framework is to stabilise the POLONIA rate close to the reference rate. POLONIA, or Polish Overnight Index Average, is based on unsecured overnight interbank transactions in Polish zloty. The NBP does not classify its operational framework as one of the three main types discussed in Section 2, but our judgement is that it shares most similarities with a corridor system. The corridor width is currently 100 basis points. The NBP applies reserve requirements for

[42] Allocation is made according to the multi-price method.

monetary policy counterparties with the aim of increasing the stability of short money market rates.[43]

3.10.1 Instruments

Standing facilities, available to all monetary policy counterparties

The NBP remunerates central bank reserves up to the level of the reserve requirement at the reference rate. Central bank reserves above that level can be placed in the overnight deposit facility and earn the deposit rate, which is 50 basis points below the reference rate.[44] The NBP offers overnight lending against eligible collateral in the Lombard facility. The interest rate on the facility, the Lombard rate, is 50 basis points above the reference rate. The deposit rate and the Lombard rate constitute the floor and ceiling of the interest rate corridor of the operational framework.

Unlimited interest-free intraday credit is offered against eligible collateral in the payment system.

Market operations, available to all monetary policy counterparties

The NBP's main market operation aims to drain liquidity from the banking system. They do this by issuing bills once a week. The bills have a maturity of seven days and are offered in limited volumes at a fixed interest rate corresponding to the reference rate.

The regular issuance of bills is complemented by fine-tuning operations as needed. Fine-tuning operations are typically used to absorb liquidity and are offered either in the form of liquidity-absorbing repos or through additional issues of bills. Repo operations typically have a maturity of between one and three days and are offered at an interest rate equal to the reference rate.

3.10.2 Counterparties

The NBP has one set of counterparties for all its zloty-denominated instruments. Banks are authorised to become monetary policy counterparties. Thus, we classify the NBP's set of counterparties as narrow. On 30 June 2023 the NBP had 47 counterparties.

3.10.3 Collateral

According to our classification, the NBP accepts a wide collateral pool for credit. At the same time, we note that it is relatively narrow in terms of currency. Accepted collateral includes securities issued or guaranteed by the Polish state, securities issued by the NBP, as well as municipal bonds, covered bonds and corporate bonds if they

[43] The NBP uses an average reserve requirement. The reserve requirement level is 3.5 per cent of the reserve base.

[44] Central bank reserves other than those held to fulfil reserve requirements do not earn the deposit rate automatically. Rather, this requires an active choice by the counterparty. The central bank reserves left on the account earn 0 per cent interest.

are issued in zloty and have a high credit rating. In addition, the NBP accepts euro-denominated government bonds as collateral for credit. Intraday credit in the payment system is offered against the same collateral pool.

3.11 Sweden - Sveriges Riksbank (RB)

The RB's main policy rate is called the policy rate. The objective of the RB's monetary policy framework is to stabilise short-term market rates close to the policy rate. The RB uses a symmetric corridor system to implement monetary policy and also explicitly classifies its operational framework as such. The width of the corridor is 20 basis points.

3.11.1 Instruments

Standing facilities, available to all monetary policy counterparties

The RB offers one standing deposit facility and two standing lending facilities. In the standing deposit facility, counterparties can place an unlimited amount of liquidity overnight at the deposit rate. The deposit rate corresponds to the policy rate minus 10 basis points and constitutes the floor of the policy rate corridor. Overnight lending is primarily offered through the standing lending facility. Lending in that facility is offered without restriction against high-quality collateral, referred to as the primary collateral pool, at the lending rate. The lending rate corresponds to the policy rate plus 10 basis points and constitutes the ceiling of the corridor. In cases where counterparties do not have sufficient primary collateral to cover their borrowing needs, they are given the option of borrowing the remainder from the supplementary liquidity facility. In the supplementary liquidity facility, counterparties can borrow against a wider pool of collateral, referred to as the secondary collateral pool, at the liquidity facility rate equal to the policy rate plus 75 basis points.

Unlimited interest-free intraday credit is offered against accepted collateral within the payment system.

Market operations, available to all monetary policy counterparties

The RB conducts weekly market operations to balance the liquidity position of the banking system. This means that market operations are offered as liquidity-providing when the banking system has a liquidity deficit and as liquidity-absorbing when the banking system has a liquidity surplus. For several years, the latter has been the case, meaning that the RB uses market operations to absorb liquidity. RB does this by issuing Riksbank certificates. The Riksbank certificates are negotiable securities, known as bills or discount securities, which accrue at the policy rate. The RB issues them once a week in a limited volume, usually corresponding to the liquidity position of the banking system vis-à-vis the RB. Riksbank Certificates normally have a maturity of seven days.

3.11.2 Counterparties

The RB has one set of counterparties for the monetary policy operational framework. Only entities that are credit institutions with a registered office or branch in Sweden are eligible to apply to become a counterparty. For this reason, we classify the RB's set of counterparties as narrow. In addition to being a credit institution, a monetary policy counterparty must also fulfil a number of additional requirements, such as being a participant in the central payment system RIX and having sufficient operational capacity. On 30 June 2023 the RB had 26 monetary policy counterparties.

3.11.3 Collateral

The RB differentiates the eligible collateral between its monetary policy instruments. Throughout, the RB accepts securities denominated in seven different currencies.[45]

According to our classification, the so-called primary collateral pool is narrow, while the so-called secondary collateral pool is wide. The primary collateral pool - which is required from counterparties wishing to use the standing lending facility or, if offered, liquidity-providing repos - includes government bonds and central bank receivables. The secondary collateral pool, which is accepted in the supplementary liquidity facility, includes a number of different types of securities, including agency-issued securities, covered bonds and corporate bonds.

Intraday credit is granted against both primary and secondary collateral pools.

3.12 Switzerland - Swiss National Bank / Banque Nationale Suisse / Banca Nazionale Svizzera (SNB)

The SNB's main policy rate is called just that, the SNB policy rate. The objective of the SNB's monetary policy framework is to stabilise short secured money market rates close to the SNB's policy rate.[46] In addition, the SNB has specified that it considers SARON to be the main collateralised money market rate.[47]

The SNB does not classify its monetary policy operational framework as one of the main types discussed in Section 2. In official descriptions, however, the SNB refers to its operational framework as one of reserve tiering and reserve absorption. Because of this, and based on the characteristics of the operational framework, our judgement is that it shares most similarities with a quota system. The SNB applies reserve requirements for banks, see below.

[45] Accepted currencies are Swedish krona, US dollar, British pound, Danish krone, euro, Japanese yen and Norwegian krone.

[46] The SNB's monetary policy strategy emphasises not only the level of short market rates, but also the exchange rate.

[47] SARON is the Swiss Average Rate Overnight, a secured reference rate.

3.12.1 Instruments[48]

Standing facilities, available to all monetary policy counterparties

In line with a quota system, the SNB applies a tiered remuneration of domestic banks' deposits with the central bank.[49] Deposits up to a certain threshold, corresponding to an adjusted measure of banks' reserve requirements multiplied by a factor determined by the SNB, earn interest at the SNB's policy rate.[50] Deposits above this threshold earn a lower interest rate, the SNB's policy rate with a deduction. The deduction is currently set at 50 basis points. Counterparties that are not domestic banks, but have a deposit account, receive the lower interest rate on their entire account balance.

The SNB offers overnight lending against collateral via a lending facility known as the liquidity shortage financing facility. The lending is provided via repo transactions and the collateral pledged by the counterparties must be valued to at least 110 per cent of the amount borrowed.[51] The lending rate corresponds to the SNB's policy rate plus 50 basis points. In addition, CNB offers lending without a predetermined maturity through its Covid-19 refinancing facility. Lending is collateralised and at an interest rate equal to the SNB's policy rate.[52]

Unlimited interest-free intraday credit is offered in the form of repos against accepted collateral. As with the liquidity shortage financing facility, the value of the collateral must be at least 110 per cent of the loan amount.

Market operations, available to all monetary policy counterparties

The SNB's market operations include liquidity-absorbing repo transactions and the issuance of its own securities, known as SNB bills. The purpose of the SNB bill issues is to absorb liquidity and the market operation is usually offered once a week. The bills have maturities between 28 and 336 days and are issued by auction in limited volumes. The auctions are conducted as variable rate tender procedures. The liquidity-absorbing repo transactions are offered by the SNB every business day. Generally speaking, the repos follow the standard contracts in the Swiss franc repo market. The maturity can vary from overnight to several months, but is usually one

[48] Note that the SNB categorises its instruments within the operational framework into three categories: open market operations, standing facilities and interest on deposits. However, we classify the interest on deposit accounts as a standing facility, see the introduction to Section 3.

[49] In this context, 'domestic' refers to both Switzerland and the Principality of Liechtenstein.

[50] From 1 December 2023 sight deposits up to the level of the reserve requirement minus cash holdings are not remunerated i.e. earn an interest of 0 per cent. Sight deposits above this level, but below the threshold, continue to be remunerated at the SNB policy rate.

[51] The amount a counterparty can borrow in the facility is limited by a counterparty-specific limit. The limit is normally determined for one year at a time and is set so that it is not binding except in extraordinary situations. Because of this, we classify the lending as a facility and not a market operation.

[52] The facility was set up as a temporary facility during the Covid-19 pandemic, but remains active as of summer 2023.

week. The interest rate on transactions is currently the SNB's policy rate minus five basis points.[53]

3.12.2 Counterparties

According to our definition, the SNB has a wide set of counterparties as it extends beyond credit institutions. Domestic banks have access to all monetary policy instruments and benefit from the differentiated interest rate setting on deposits. Other counterparties have access to all instruments, but do not receive the tiered remuneration. These counterparties can be, for example, insurance companies or domestic non-bank financial institutions. The SNB accepts non-bank entities as counterparties if they are deemed to have a clear monetary policy objective and are considered to contribute to the liquidity of the Swiss franc repo market. In addition, agents must also fulfil the requirements for opening a deposit account with the SNB.

The SNB does not publish any information about its counterparties. However, the SNB's annual report for 2022 indicated that 73 market participants had been granted a limit to access the liquidity shortage facility. Moreover, at the end of 2022, there were 311 payment system participants, which is a prerequisite for participation in the Swiss repo market.

3.12.3 Collateral

We classify the accepted collateral pool of the SNB's liquidity shortage facility, intraday facility and liquidity-providing repos as wide. Accepted collateral includes, in seven different currencies, for example, debt securities issued by central banks, the public sector, international and supranational institutions, multilateral development banks and private entities. Subject to certain restrictions, covered bonds and securities issued by Swiss mortgage banks and institutions are also accepted. Although the SNB accepts a wide range of claims as collateral for credit in the Covid-19 refinancing facility, we classify this collateral pool as narrow because only claims denominated in Swiss francs are accepted.

3.13 United Kingdom - Bank of England (BoE)

The BoE's main policy rate is Bank Rate. The objective of the BoE's monetary policy operational framework is to stabilise short-term wholesale interest rates close to Bank Rate. The BoE uses a floor system to implement monetary policy, and explicitly refers to its operational framework as such. In addition to this scheme, which is designed to implement monetary policy, the BoE also offers a liquidity insurance scheme to support its financial stability objectives. These facilities are not included in this description.

3.13.1 Instruments

Standing facilities, available to all monetary policy counterparties

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[53] The interest rate can either be fixed for the duration of the transaction or indexed to the SNB's policy rate.

The BoE pays interest on central bank reserves held in so-called reserve accounts. Central bank reserves held in these accounts earn the Bank Rate. In addition, the BoE offers an operational standing deposit facility that is priced 25 basis points below Bank Rate. This is mainly addressed to counterparties that do not have central bank reserve accounts. The BoE offers secured overnight lending through the operational standing lending facility at an interest rate of 25 basis points above Bank Rate.

Unlimited interest-free intraday credit is offered in the payment system against collateral.

Market operations, available to some monetary policy counterparties

The BoE offers a liquidity-providing open market operation for monetary policy purposes. It is offered in the form of short-term repos. Auctions are held weekly with no limit on the volume offered. The transactions have a maturity of one week and the interest rate corresponds to Bank Rate.

3.13.2 Counterparties

We classify the BoE's set of counterparties as wide because it includes banks, building societies, broker-dealers, central counterparties and international central securities depositories. However, access to the different monetary policy and stability instruments is differentiated between different types of counterparties.

All the institutions listed above, provided they fulfil a number of requirements such as being a member of the CHAPS central payment system, are eligible to use the BoE's standing facilities within the operational framework.

Access to market operations, i.e. short-term liquidity-providing repos, is reserved for banks, building societies and broker-dealers. Thus, only these three types of counterparties are authorised to use all instruments within the monetary policy operational framework.

On 22 June 2023 the BoE had 218 counterparties with access to central bank accounts and operational standing facilities, and 115 counterparties with access to market operations.

3.13.3 Collateral

The type of collateral required to borrow from the BoE differs between instruments. For the instruments that the BoE offers for monetary policy purposes and that we have outlined in this description, the BoE accepts, according to our classification, a narrow collateral pool.[54] These securities consist of high-quality securities that trade

[54] A wider collateral pool is accepted for the lending offered for financial stability reasons.

in very deep markets and are issued by governments.[55] These are called "Level A collateral".

3.14 United States – Federal Reserve System (Fed)

The Fed's main policy rate is a target range for the federal funds rate. The federal funds rate is the interest rate on transactions in which a limited group of market participants, known as depository institutions, trade federal funds (central bank reserves) with each other overnight, unsecured. The objective of the Fed's monetary policy operational framework is to stabilise the federal funds rate within the target range, which is currently 25 basis points wide. The Fed classifies its operational framework as a floor system, but often uses the term "ample reserves regime" to describe it. The interest rates on the different instruments of the operational framework are announced as separate decisions.

3.14.1 Instruments

Standing facilities, available to some monetary policy counterparties

The Fed pays interest on account balances at the central bank at the interest on reserve balances (IORB). This rate is currently set around the centre of the target range, 10 basis points below the upper limit of the range and 15 basis points above its lower limit. The IORB represents the first floor for short-term market interest rate.

Overnight lending is offered against eligible collateral through the primary credit facility of the discount window.[56] The primary credit rate is currently set at the top of the target range for the federal funds rate and provides a theoretical ceiling for interest rates in the federal funds market.

Market operations, available to some monetary policy counterparties

Every business day, the Fed offers liquidity-absorbing market operations in the form of repo transactions in the Overnight Reverse Repurchase Facility (ON RRP). In these operations, counterparties can exchange cash for high-quality collateral overnight. Market operations are offered in limited volume, with both individual and aggregate limits.[57] The interest rate of the facility, the ON RRP rate, is the maximum interest rate at which the Fed is willing to conduct operations, while the actual interest rate for counterparties is determined through an auction procedure. The ON RRP rate is

[55] The securities concerned are denominated in pounds, euros, US and Canadian dollars and issued by governments and central banks in the United Kingdom, Canada, France, Germany, the Netherlands and the United States.

[56] Three types of credit can be offered through the discount window: primary, secondary and seasonal credit. Only primary credit is freely available on the counterparty's own initiative. In addition, there are restrictions on the use of secondary and seasonal credit that do not apply to primary credit. Primary credit can have a maturity of up to 90 days.

[57] The transactions are conducted against US government bonds. The overall limit comes from the value of US government securities in the System Open Market Account (SOMA), the Fed's holdings of government securities. In addition, there are limits at the counterparty level which restrict the use of the operations.

currently 10 basis points lower than the IORB. The ON RRP rate represents the lower, more solid floor for short-term market rates.

In addition to the ON RRP, the Fed also offers daily liquidity-providing market operations through repo transactions. These open market operations have an overnight maturity and are offered under the Standing Repo Facility (SRF). These market operations are conducted as an auction procedure and the total volume offered is limited.[58] The facility rate, the SRF rate, is the minimum rate at which the Fed is willing to conduct operations, and the actual rate is set based on the bids received in the auction. The SRF rate currently corresponds to the upper limit of the target range.

3.14.2 Counterparties[59]

We characterise the Fed's set of counterparties for its monetary policy framework as wide according to our definition. Counterparties may belong to one or more of four possible counterparty categories:

- depository institutions
- primary dealers
- ON RRP counterparties
- SRF counterparts

Depository institutions are the only counterparty category that, provided they fulfil certain requirements, can hold interest-bearing accounts in the Federal Reserve System and can access the discount window. These operators can also apply to become and be recognised as counterparties of the SRF.

Primary dealers have access to both the ON RRP and SRF.[60] On 30 June 2023, the number of dealers was 24.

In addition to dealers, other federally or state authorised banks (or federally or state licensed branches or agents of foreign banks), for example, may apply to become SRF counterparties, provided they meet certain size and repo market participation requirements. There were 18 SRF counterparties on 30 June 2023. Potential ON RRP counterparties include, in addition to dealers, other federally or state-authorised banks or savings banks, government-sponsored enterprises and certain money market funds. On 30 June 2023, the Fed had around 140 ON RRP counterparties.

[58] The market operation is conducted through a so-called multi-price auction.

[59] The Federal Reserve System generally uses the term "counterparty" to refer to counterparties in its market operations; that is, counterparties with access only to interest-bearing accounts at the central bank or lending through the discount window are not included in the term. In line with how most of the central banks in our sample refer to their counterparties, we consider all market participants that can transact with the Fed as its monetary policy counterparties.

[60] To be a primary dealer, the operator must be either a federally or state authorised bank or savings bank (or federally or state licensed branch or agent of a foreign bank), or a broker-dealer. In addition, they must fulfil a number of requirements, including that they are expected to participate consistently, and on market terms, in open market operations and that they are expected to maintain a certain level of activity in most markets.

3.14.3 Collateral

The collateral the Fed accepts when lending varies by instrument. In the discount window, the Fed accepts a wide collateral pool, such as US Treasuries, agency bonds, foreign government-guaranteed securities in ten different currencies, corporate bonds, asset-backed securities and other secured debt and loan portfolios. In the SRF, the accepted collateral pool is narrower; only US government bonds, agency debt instruments and agency mortgage bonds are accepted. All these securities must be denominated in US dollars.

4 Differences and similarities between central banks' operational frameworks

Based on the review in the previous section, we can draw a number of conclusions about the differences and similarities between the different central banks' operational frameworks. This section describes them in terms of five different parameters, the operational objectives of the framework, the classification of the framework (corridor system, floor system or quota system) and the three components of the framework – instruments, counterparties and collateral.

4.1 Operational objective of the monetary policy framework

The operational objectives of the central bank’s monetary policy operational frameworks can be said to be similar in the sense that all central banks intend to steer some form of money market rates. A handful of the central banks identify a specific interest rate that they intend to control, or that they consider most important, while others express themselves more generally, with the aim of stabilising short market rates overall.[61] The main features of each central bank's operational objectives are summarised in Table 1 below.

Notably, the European Central Bank and Česká národní banka are the only ones of the 14 central banks that do not have an officially stated operational objective for their operational frameworks. However, it is clear from their behaviour that they, like other central banks, intend to steer short money market rates with their operational frameworks. All the other central banks, with the exception of Denmark, have in common that the target level of the interest rates they intend to steer is clear, and the same as the main policy rate.[62] None of the central banks communicate an acceptance range for deviations from this target.

[61] Among the central banks that designate a specific interest rate, it also varies whether this rate is secured or unsecured.

[62] Note that the Federal Reserve communicates a target range while others have a point estimate, the level of the main policy rate.

Table 1. Key elements of the operational objectives of the monetary policy framework

Central bank	Maturity	Interest rate type	Between agents
RBA	O/N	Based on unsecured transactions	Specified
BoC	O/N	Based on secured transactions	Specified
CNB		*No officially stated operational objective*	
DN	Short	Money market	Unspecified
ECB		*No officially stated operational objective*	
MNB	Short	Market rates	Unspecified
SI	Short	Market rates	Specified
RBNZ	Short	Market rates	Unspecified
NB	Short	Market rates	Unspecified
NBP	O/N	Based on unsecured transactions	Specified
RB	Short	Market rates	Unspecified
SNB	O/N	Based on secured transactions	Specified
BoE	Short	Market rates	Unspecified
Fed	O/N	Based on unsecured transactions	Specified

Note: "Between agents" means whether the central bank's operational objectives specify between which types of agents the relevant interest rate is to be evaluated.

As a central bank, being clear about which market rate or rates it considers most important to control can contribute to a clearer and more predictable monetary policy. In addition, it can create better conditions for evaluating the monetary policy conducted, both by the central bank itself and by the public. At the same time, the designation of a specific interest rate by the central bank should not be given disproportionate importance. Since short money market rates are usually co-varying, the transmission of monetary policy should not be significantly affected either.

4.2 Main categories of operational frameworks

The review of central banks' operational frameworks shows that all three main categories of operational framework discussed in Section 2 - corridor system, floor system and quota system - are represented among the central banks we have studied. At the same time, it can be noted that only about half of the central banks explicitly characterise their frameworks as one of the three main types. Table 2 below shows the type of operational framework used by the central banks in our sample. Where the central bank itself does not categorise its operational framework, the categorisation that we find most appropriate to describe the main features of each operational framework is shown.

The fact that all categories of operational framework are represented, and that it is relatively common for central banks not to officially categorise their operational framework, reinforces the view that there is no one-size-fits-all solution for designing operational frameworks. The differences between central banks, and in particular the way they have designed instruments, counterparties and collateral rules, can often be attributed to differences in objectives, mandates or other local conditions. Differences in the type of operational framework applied are also influenced by other considerations which can often be of a more ideological nature. For example, several central banks with floor systems, including the Federal Reserve and the Bank of England, state that by creating a surplus of liquidity, they also want to make it easier for banks to fulfil their regulatory liquidity requirements in order to prevent financial stability problems.[63] At the same time, several of the central banks that apply corridor or quota systems, such as Sveriges Riksbank and Norges Bank, emphasise that they want to encourage banks to seek market solutions for their liquidity management.[64]

[63] See, for example, Bank of England (2018).

[64] See, for example, Norges Bank (2014) and Sveriges Riksbank (2022)

Table 2. Categorisation of operational frameworks

Central bank	Central bank's categorisation	Authors' categorisation
RBA	Floor	
BoC	Floor	
CNB		Corridor
DN	Corridor	
ECB		Floor
MNB		Corridor
SI	Corridor	
RBNZ	Floor	
NB	Quota	
NBP		Corridor
RB	Corridor	
SNB		Quota[1]
BoE	Floor	
Fed	Floor[2]	

Note: 1: The official term used by the SNB for its operational framework is reserve tiering and reserve absorption. 2: The Fed often uses the term "ample reserves regime" to describe its floor system. However, the official term is floor system.

4.3 Instruments

All the central banks in our sample offer some form of interest-bearing standing deposit facility where either all or some of the monetary policy counterparties can place an unlimited amount of liquidity overnight.[65] In cases where not all counterparties have access to the deposit facility, the distinction is usually made on the basis of which counterparties are subject to reserve requirements or are direct participants in the payment system, see Table 5. Those subject to reserve requirements, or direct participants, are the counterparties that usually have access to the deposit facility. In practice, this is often equivalent to counterparties that are credit institutions. The Reserve Bank of New Zealand and the Bank of England stand out in that they offer two standing deposit facilities aimed at two different categories of counterparties. This means that these two central banks allow more than one category of agent to invest in the central bank without restriction, but at different interest rates.

Central banks operating under corridor or quota systems typically apply an interest rate on their deposit facility equal to the main policy rate minus between 10 and 100

[65] However, some central banks do not designate their interest-bearing accounts with the central bank as a standing facility, see the introduction to Section 3.

basis points. Instead, central banks that apply a floor system often equate the interest rate on the deposit facility with the main policy rate or apply a smaller deduction of, for example, 10 basis points.

There are some central banks that offer additional liquidity-absorbing instruments that are labelled as facilities, but which, according to our definition, are considered regular market operations rather than standing facilities. In the vast majority of cases, this is due to the fact that these instruments are subject to constraints that do not allow counterparties to place an unlimited amount of liquidity at the end of the day, nor with predetermined conditions. An example of this is the Federal Reserve's Overnight Reverse Repo Facility, which has an upper limit on the volume each counterparty can place in the instrument on a daily basis. In addition, these transactions are also not executed at the end of the day.

With one exception, all central banks also offer some form of overnight lending facility. As with deposit facilities, there are those central banks that offer the lending facility to a limited number of their counterparties. Where this occurs, it is usually based on the same differentiation principle that applies to the deposit facility. In some cases, central banks offer lending through repo transactions, but in the vast majority of cases through a collateralised credit line. Also in the case of lending, central banks may refer to instruments as facilities, but we classify them as regular market operations. This is because they are subject to significant limitations. According to our classification, only two central banks offer more than one standing lending facility, Sveriges Riksbank and the Swiss National Bank. Furthermore, Danmarks Nationalbank stands out as the only central bank that does not provide a standing lending facility. Instead, it offers a weekly liquidity-providing market operation with full allotment.

Central banks applying corridor or quota systems typically set the interest rate on their lending facilities at the main policy rate plus between 10 and 100 basis points. Central banks with a floor system typically apply a 25 basis point supplement. Seðlabanki Íslands stands out in that it maintains an interest rate setting equal to the main policy rate after a supplement of 175 basis points. Table 3 below summarises information on central banks' standing deposit and lending facilities and for relevant central banks, the interest rate applied for quotas and reserve requirements.

Table 3. Standing facilities in the monetary policy framework

Central bank	Interest on reserve requirement or quota (form of requirement)	Standing deposit facilities number / interest rate (maturity if other than O/N)	Outstanding lending facilities number / interest rate (maturity if other than O/N)
RBA	Main policy rate minus 10 basis points (reserve requirement)	**1** / Main policy rate minus 10 basis points	**1** / Main policy rate plus 25 basis points
BoC	n/a	**1** / Main policy rate	**1** / Main policy rate plus 25 basis points
CNB	Main policy rate[1] (reserve requirement)	**1** / Main policy rate minus 100 basis points	**1** / Main policy rate plus 100 basis points
DN	n/a	**1** / Main policy rate	
ECB	Deposit facility rate[2] (reserve requirement)	**1** / Deposit facility rate	**1** / Marginal lending facility rate (currently 75 basis points above the deposit facility rate).
MNB	Main policy rate (reserve requirement)	**1** / Main policy rate minus 100 basis points	**1** / Main policy rate plus 100 basis points
SI	Interest-free (reserve requirement)[3]	**1** / Main policy rate minus 25 basis points	**1** / Main policy rate plus 175 basis points
RBNZ	n/a	**2**[4] / Main policy rate / Main policy rate minus 10 basis points (O/N, T/N, T/W)	**1 /** Main policy rate plus 25 basis points
NB	Main policy rate (quota)	**1** / Main policy rate minus 100 basis points	**1 /** Main policy rate plus 100 basis points
NBP	Main policy rate (reserve requirement)	**1** / Main policy rate minus 50 basis points	**1** / Main policy rate plus 50 basis points
RB	n/a	**1** / Main policy rate minus 10 basis points	**2**[5] / Main policy rate plus 10 basis points / Main policy rate plus 75 basis points
SNB	Main policy rate (quota and reserve requirements)[6]	**1** / (currently) Main policy rate minus 50 basis points	**2**[7] / (currently) Main policy rate plus 50 basis points / Main policy rate (without maturity)
BoE	n/a	**2**[8] / Main policy rate / Main policy rate minus 25 basis points	**1** / Main policy rate plus 25 basis points
Fed	n/a	**1** / Interest rate on central bank reserves (currently 10 basis points below the ceiling and 15 basis points above the floor of the target range).	**1** / Primary credit rate (currently at the ceiling of the main target range).

Note: 1: From 5 October 2023, the interest rate on reserve holdings is 0 per cent. 2: From 20 September 2023, the interest rate on reserve holdings is 0 per cent. 3: The reserve requirements have no monetary policy purpose. 4 & 8: The deposit facilities are offered to two different categories of agent. 5 & 7: The lending facilities have different collateral requirements. 6: From 1 December 2023, the interest rate on reserve holdings is 0 per cent.

There is much more variation across the central banks in regular market operations than in standing facilities. For market operations, on the other hand, there is a clearer link between the market operations offered by the central banks and the main type of operational framework they apply.

Central banks with an ambition to either balance the liquidity position of the banking system or to limit excess liquidity, which is common in corridor and quota systems, usually offer short-term securities issues, fixed deposits or longer liquidity-absorbing repos. If the liquidity position is in reasonable structural balance, and the central bank's work is therefore more concerned with parrying temporary fluctuations in the liquidity position, central banks tend to offer both liquidity-providing and liquidity-absorbing market operations. In contrast, central banks that have large liquidity surpluses, but also apply corridor or quota systems, tend to conduct only liquidity-absorbing market operations. The greater the fluctuations in the liquidity position, the greater the need to conduct regular market operations in both directions.

Countries with floor systems or de facto floor systems typically offer liquidity-providing market operations with generous conditions to ensure that the banking system has excess liquidity.[66] Such operations usually take the form of liquidity-providing repos. Central banks that apply floor systems usually also use asset purchases to ensure ample liquidity supply. However, these market operations are not addressed in this article, in line with the delimitation set out in the introduction to Section 3. A number of central banks applying floor systems also offer a liquidity-absorbing market operation. These operations typically extend to a wider group of agents than those with access to the central bank's standing deposit facility and aim to establish a secondary floor for short market rates. This is because central banks want to avoid what is known as a "leaky floor", namely the stabilisation of money market rates for a wider group of agents below the standing deposit facility rate.

Table 4 below summarises information on the various market operations regularly used by central banks. From the summary, it can be concluded that market operations are usually offered daily or once a week. Furthermore, their maturity tends to vary between one day and one month. It is common for central banks to offer market operations at the main policy rate. In cases where the interest rate does not correspond to the policy rate, it usually constitutes the ceiling for the interest rate in liquidity-absorbing market operations and the floor for the interest rate in liquidity-providing market operations.

[66] By de facto floor systems, we mean frameworks that exhibit clear features of floor systems without the central banks themselves using the term for their respective operational frameworks, see Section 4.2.

Table 4. Frequently used market operations in the monetary policy framework

Central bank	Liquidity-absorbing Number (frequency) type of operations	(Maturity) Interest rate	Liquidity-providing Number (frequency) type of operations	(Maturity) Interest rate
RBA			**2** (weekly) repo transactions (daily) repo transactions	(28 days) The interest rate is set by auction. The lower bound corresponds to the interest rate for OISs with the same maturity plus a supplement, currently equivalent to 5 basis points. (without maturity limit) The main policy rate after a supplement of 10 basis points.
BoC	**1** (daily) repo transactions	(O/N) The interest rate corresponds to the main policy rate.	**2**[1] (daily) repo transactions	(O/N) The interest rate is set by auction. The lower bound corresponds to the main policy rate. (O/N) The interest rate corresponds to the main policy rate.
CNB	**1** (three times per week) repo transactions	(14 days) The interest rate is set by auction. The upper bound corresponds to the main policy rate	**1** (weekly) repo transactions	(14 days) For banks, the rate is equal to the main policy rate plus 10 basis points. For other counterparties, the interest rate corresponds to the policy rate plus 20 basis points.
DN	**1** (weekly) central bank bills issue	(7 days) The interest rate corresponds to the main policy rate.	**1** (weekly) fixed-rate lending	(7 days) The interest rate corresponds to the main policy rate plus 15 basis points.
ECB			**2** (weekly) repo transactions (monthly) repo transactions	(7 days) Main refinancing rate. Corresponds (currently) to a level 50 basis points above the deposit facility rate. (3 months) The interest rate corresponds to the average main refinancing rate (see above).
MNB	**3** (weekly) issuance of central bank bills (monthly) term deposits (daily) FX swaps (EUR/HUF)	(7 days) The interest rate corresponds to the main policy rate. (1 month)[2] The interest rate corresponds to the main policy rate plus a supplement of currently 0 basis points. (T/N) The MNB sets an upper bound for accepted bids.		
SI	**1** (weekly) term deposits	(7 days) The interest rate corresponds to the main policy rate.		

Note: 1: We have classified the BoC standing liquidity-providing overnight repo facility as a regular market operation instead of a standing facility because it is subject to counterparty limits. 2: The MNB reserves the right to offer term deposits with a maturity of up to 6 months. However, it is usually offered with a one-month maturity.

Central bank	**Liquidity-absorbing** Number (frequency) type of operations	(Maturity) Interest rate	**Liquidity-providing** Number (frequency) type of operations	(Maturity) Interest rate
RBNZ	**2** (twice a week)[3] issuance of central bank bills (daily/ as necessary) FX swaps	(7 and 28 days) The interest rate is determined by auction. The upper bound is given by the main policy rate, or market pricing, at longer maturities. (1 day - 6 months) The interest rate is at most equal to the main policy rate.	**1** (daily/as necessary) FX swaps	(1 day - 6 months) The interest rate is at least equal to the main policy rate.
NB	**1** (as necessary) term deposits	(1 day - not specified)[4] The interest rate is set by auction. The upper bound corresponds to the main policy rate.	**1** (as necessary) fixed-rate lending	(1 day - not specified)[5] The interest rate is set by auction. The lower bound corresponds to the level of the main policy rate.
NBP	**2** (weekly) issue of NBP bills. (as necessary) repo transactions	(7 days) Interest rate corresponds to the main policy rate (1-3 days)[6] Interest rate corresponds to the main policy rate.		
RB	**1** (weekly) issuance of central bank bills (Riksbank certificates)	(7 days) Interest rate corresponds to the main policy rate.		
SNB	**2** (weekly) issuance of central bank bills (SNB bills) (daily) repo transactions	(28-336 days) Interest rate set via auction procedure (7 days)[7] Interest rate corresponds (currently) to the main policy rate after a deduction of 5 basis points.		
BoE			**1** (weekly) repo transactions	(7 days) Interest rate corresponds to the main policy rate.
Fed	**1** (daily) repo transactions	(O/N) The interest rate is set by auction. The upper bound (ON RRP rate) corresponds (currently) to a level 20 basis points below the floor of the main target range.	**1** (daily) repo transactions	(O/N) The interest rate is set by auction. The lower bound (SRF rate) corresponds (currently) to the level of the ceiling of the main target range.

Note: 3: The RBNZ offers to issue central bank bills twice a week, on each occasion offering maturities of 7 and 28 days. 4 & 5: Norges Bank does not specify an upper bound on the maturities at which it may offer F-deposits and F-loans. 6: Repo transactions typically have a maturity of between 1 and 3 days but may have a longer maturity. 7: Under the terms and conditions, the maturity of repo transactions can vary from one day to several months. However, since September 2022, the offered maturity has always been equal to one week.

4.4 Counterparties

Just as there are significant differences between the instruments applied by central banks, there are also significant differences between central banks' counterparties. In addition, the extent to which central banks publish information on which institutions are their counterparties varies. Some central banks do not even publish information on how many counterparties they have, while other central banks make available lists of exactly which counterparties they have.

In this article, we define the set of counterparties as narrow when only credit institutions, such as banks, mortgage lenders and the like, can become counterparties. In half of the countries, such a narrow set of counterparties is applied to all instruments. In other countries, the set of counterparties extends beyond credit institutions. These additional agents include, for example, central counterparties, insurance companies and money market funds.

It can be seen that all central banks with a wide set of counterparties apply differentiated access to the instruments in their operational frameworks. Some categories of counterparties, typically non-credit institutions, may only have access to certain specific instruments, while others have access to all instruments, or some instruments are only open to certain types of counterparties. A distinction is usually made between those counterparties that are subject to reserve requirements or are direct participants in the payment system, and those that are not subject to these requirements or are direct participants. Different categories of counterparties may also have access to the instruments under different conditions, e.g. in terms of interest rates or eligible collateral.

It can also be noted that in recent years several central banks have revised their set of counterparties in a way that extends it beyond credit institutions.[67] Table 5 below summarises information on central bank counterparties in the monetary policy operational framework.

[67] An example of this is Česká národní banka, which from May 2020 extended access to certain market operations to non-credit institutions. The Federal Reserve also noticeably expanded its set of counterparties with the introduction of the ON RRP facility in 2015 after tests started in 2013.

Table 5. Set of counterparties in the monetary policy framework

Central bank	Narrow/ Wide set of counterparties	Differentiated access to instruments	
RBA	Wide	Yes	Only direct participants in the payment system (RITS) have access to standing facilities.
BoC	Wide	Yes	Only direct participants in the payment system (Lynx) have access to standing facilities. Only primary dealers have access to market operations.
CNB	Wide	Yes	Only counterparties subject to reserve requirements have access to standing facilities and liquidity-absorbing market operations. These counterparties also face more favourable conditions (interest rate and collateral pool) than other participants in liquidity-providing market operations.
DN	Narrow	No	
ECB	Narrow	No	
MNB	Narrow	No	
SI	Narrow	No	
RBNZ	Wide	Yes	Direct participants in the payment system (ESAS) face more favourable conditions (interest rate) for deposits O/N.
NB	Narrow	No	
NBP	Narrow	No	
RB	Narrow	No	
SNB	Wide	Yes	Counterparties subject to reserve requirements face more favourable conditions (interest rate) for deposits O/N.
BoE	Wide	Yes	Only banks, mortgage institutions and broker-dealers have access to market operations.
Fed	Wide	Yes	Depository institutions face more favourable conditions for deposits and lending O/N. Dealers in US government securities (unless they are also depository institutions), government-sponsored enterprises and money market funds do not have access to account deposits or discount window lending, but only to (all or some) market operations.

Note: Operators typically have to fulfil a variety of requirements to access a central bank's instruments under the operational framework. It therefore usually differs more between agents than what is specified in the fourth column of the table. The table is not intended to present these requirements in detail but to provide an overview of the main features of the design of central banks' counterparty groups.

4.5 Collateral

With regard to the third element of the operational framework, the accepted collateral, there are also significant differences, but also similarities, between the central banks we studied. All central banks require collateral from their counterparties when lending. It is also common for central banks to apply the same collateral requirements for lending in standing facilities as for lending in market operations. Where the requirements differ, the requirements for market operations are in all cases more stringent.

However, whether central banks accept a narrow or a wide collateral pool according to our definition differs. In about half of the cases, a narrow collateral pool is required. It is usually the requirement that the collateral be denominated in the domestic currency that makes us classify it as narrow. However, some central banks only provide credit against government bonds or equivalent debt instruments, which also leads us to classify the collateral pool as narrow. However, only the Bank of England and Sveriges Riksbank require the collateral to consist of government bonds, without also requiring them to be denominated in their own currency. Furthermore, Sveriges Riksbank is unique in having two facilities that require different collateral for the same set of counterparties and with the difference in interest rate being the only other difference in terms and conditions.[68] Table 6 below summarises information on the collateral required by central banks for lending in standing facilities and market operations.

[68] However, it is very common for central banks to apply different haircuts to different types of collateral. These are usually based, for example, on creditworthiness or market liquidity. The Swiss National Bank's lending facilities are distinguished by the form of lending, with lending through the liquidity shortage financing facility being provided via repos.

Table 6. Collateral requirements for lending in the monetary policy framework

Central bank	Standing facilities	Liquidity-providing open market operations
RBA	Narrow collateral pool, only own currency	Narrow collateral pool, only own currency
BoC	Wide collateral pool	Narrow collateral pool, only own currency and government bonds
CNB	Narrow collateral pool, only own currency	Narrow collateral pool, only own currency
DN	n/a	Wide collateral pool
ECB	Wide collateral pool	Wide collateral pool
MNB	Wide collateral pool	Wide collateral pool
RBNZ	Narrow collateral pool, only own currency	Narrow collateral pool, only own currency
NB	Wide collateral pool	Wide collateral pool
NBP	Wide collateral pool	Wide collateral pool
SI	Narrow cover pool, only own currency	Narrow collateral pool, only own currency
RB	Varies by facility: • Narrow collateral pool for standing lending facility, only government bonds • Wide collateral pool for supplementary liquidity facility	Narrow collateral pool, only government bonds
SNB	Varies by facility: • Wide collateral pool for liquidity shortage facility • Narrow collateral pool for Covid-19 refinancing facility, only own currency	Wide collateral pool
BoE	Narrow collateral pool, government bonds only	Narrow collateral pool, only government bonds
Fed	Wide collateral pool	Narrow collateral pool, only own currency

Note: In the above table, we have included collateral rules for liquidity-providing market operations even in cases where the central banks in question do not currently conduct such operations on a regular basis.

5 Concluding remarks

In this article, we have described the design of fourteen central banks' operational frameworks at mid-year 2023 and highlighted key similarities and differences between them. We have limited the description to those instruments that are regularly used, thus excluding the many instruments that a central bank usually reserves the right to use. In this way, we have described and contrasted the operational frameworks on the basis of how central banks choose to apply them in *practice* and not on the basis of the many *possible* ways in which they can be applied. We hope that this article will contribute to a better understanding of how different central banks implement monetary policy in practice through their respective operational frameworks, and how central banks differ in this area. We also hope that our summary can be used as a starting point for further studies or to get a quick overview of the design of central bank operational frameworks.

At the same time, it is important to remember that operational frameworks are changeable. This article summarises the state of central bank operational frameworks as of 30 June 2023.[69] As conditions change, central banks adjust how they implement their monetary policy in order to achieve good target attainment. For example, recent years have seen significant developments in central bank operational frameworks. For example, in the wake of expansionary monetary policy measures and large liquidity surpluses, a number of central banks have switched from applying corridor systems to applying explicit or de facto floor systems.[70] At the same time, other central banks, including the Riksbank, have chosen to maintain but reform their corridor or quota systems.[71]

The coming years may be just as full of change. For example, several central banks are currently analysing what the new normal will look like in terms of their respective operational frameworks, and the European Central Bank is conducting a review of its operational framework in 2023.[72]

If the period from the 2008 financial crisis to the beginning of 2022 was characterised by a low interest rate environment and quantitative easing, 2022 and 2023 has been characterised by rising interest rates and quantitative tightening. It's a turnaround that has, among other things, highlighted the financial risks to which a central bank with a large balance sheet is exposed.[73] Several central banks have for example incurred significant financial losses in 2022 which may require them to be recapitalised.[74] The turnaround in monetary policy has also highlighted the inherent balancing act for central banks with floor systems when they want to tighten monetary policy, namely how central banks should balance the need to provide liquidity, which is necessary for the functioning of the operational framework, against the need to conduct a contractionary monetary policy. In view of the experience of financial losses in recent years, the ongoing tightening of monetary policy and the normalisation of balance sheets in many countries, it is not unreasonable to assume that the years ahead may see a renaissance of corridor and quota systems. Borio

[69] Due to the fact that the Hungarian central bank, Magyar Nemzeti Bank, implemented a number of major reforms to its operational framework in September 2023, its operational framework is described on the basis of its status on 1 October 2023.

[70] By de facto floor systems, we mean frameworks that exhibit clear features of floor systems without the central banks themselves using the term for their respective operational frameworks, see Section 4.2. The Federal Reserve, the Bank of Canada and the Bank of England have officially switched to floor systems in recent years and have declared their intention to continue doing so until further notice. In the period from autumn 2019 to autumn 2022, the European Central Bank's operational framework had clear features of a quota system, although we estimate that it mainly resembles a floor system in the summer of 2023.

[71] See Hansson and Wallin Johansson (2023).

[72] See de Guindos and Lagarde (2022).

[73] See, for example, Caruana (2011) and Borio (2023) for a discussion of the risks to which a central bank is exposed.

[74] See Bell et al (2023) for a discussion of the dynamics of why a central bank makes financial losses and the implications of this.

(2023), for example, argues that central banks should consider reintroducing such policies because of the risk of underestimating the costs of floor systems.[75]

[75] Borio (2023) uses the concept of scarce reserves systems for corridor and quota systems and abundant reserves systems for floor systems.

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Swiss National Bank (2023) 115th Annual Report: Annual Report 2022.

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PRODUCTION SVERIGES RIKSBANK
ISSN 2001-029X