



Disclosure Report

Sveriges Riksbank's FMI Disclosure Report

December 2022

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Responding Institution: Sveriges Riksbank

The information provided in the disclosure is accurate as of 31 December 2022.

A public version of this disclosure can also be found at riksbank.se

For further information, please contact rix@riksbank.se

1 Executive Summary

The key findings from the detailed assessment are grouped according to the main categories enumerated by CPMI IOSCO and are summarised in narrative form.

1.1 Summarised key findings

General organisation (Principles 1-3)

The laws, regulations and rules provide a clear and enforceable legal basis for the settlement of payments in RIX, including both services RIX-RTGS and RIX-INST, and for the use of collateral to mitigate credit risk.

Promoting a safe and efficient payment system is one of the main objectives of the Riksbank and thus governs its operation of the payment system. As a result, the public interest aspects of operating a large value payment system and a settlement service for instant payments is integrated into the work of the Riksbank. The governance arrangements at the Riksbank are either determined by law or are described in documents publicly available on the Riksbank's web site. These arrangements include the responsibilities of the Executive Board and management, and the establishment and implementation of different policies.

The division of responsibilities within the Riksbank clearly separates the responsibility for operating RIX from the oversight function. In the operation of RIX and planning for its long-term development, participants are also given the opportunity to provide input and are regularly informed.

The Riksbank has a framework for identifying, monitoring and managing the risks which arise in the operation of RIX. The Riksbank has procedures for reporting and following up such risks. These procedures are adequate and ensure that those responsible have sufficient information to make decisions about risk management. The Riksbank considers also the risks it faces from service providers in its operational risk management.

In order to promote an efficient use of RIX, the Riksbank provides comprehensive information to participants. The Riksbank also cooperates with participants and in particular those that are systems that are dependent upon RIX.

The RIX-INST settlement service is using the TARGET Instant Payment Settlement (TIPS) owned and operated by the Eurosystem. Hence the Riksbank is not in full control of this platform.

Credit and liquidity risks (Principles 4 to 7)

The designated settlement system RIX consists of two services, RIX-RTGS and RIX-INST, RIX participants are not subject to credit risk as part of the settlement process in neither of the services. The Riksbank does, however, have credit risk as it takes on exposures in relation to participants. The Riksbank is required by law to take collateral to cover those exposures. The Riksbank's collateral policy aims to mitigate credit, liquidity, market and wrong-way risk while supporting the Riksbank's monetary policy and financial stability objectives. The Riksbank's collateral management system automatically manages activities associated with accepting, releasing and valuing collateral. As the central bank of issue, the Riksbank will always have sufficient liquid resources in Swedish Krona regardless of any liquidity risk it is exposed to as a result of operating RIX.

Settlement (Principles 8-9)

The designated settlement system RIX consists of two services, RIX-INST and RIX-RTGS. All settlement in RIX is conducted in central bank money.

RIX-RTGS provides final settlement in real time throughout the day and RIX-INST provides final settlement of instant payments 24/7, which is supported by the Terms and Conditions for RIX.

Default management (Principles 13 and 14)

RIX is an RTGS payment system and settles in real time. In RIX defaults arise if a participant fails to repay intraday credits in RIX-RTGS or if a participant is declared bankrupt by a court of law. The Riksbank bears responsibility for any losses which might arise and has plans to manage such a situation. A situation in which a participant enters into bankruptcy would be managed according to the procedures for exclusion of a participant, as described under Principle 18.

General business risk and operational risk management (Principles 15 to 17)

To identify and manage business risk, the Riksbank considers changes in the Swedish market for large-value payments and controls its own costs. The pricing of RIX services is built on the principle of full cost recovery. Full cost recovery means that the Riksbank will always set prices to cover its costs. The Riksbank's collateral policy requires collateral pledged to the Riksbank to be held in secure arrangements that mitigate custody and investment risks.

RIX provides a high level of confidentiality, integrity, authentication and auditability. In recent years, RIX has achieved its target availability level of 99.85 percent on an annual basis except for in 2018 where the availability level was 99.70 percent. In addition to the planned work to practice and improve the manual routines for handling transactions when the system is unavailable, the Riksbank aims to work so that a wider range of scenarios can be managed without resorting to manual procedures. Improvements have been made regarding deliveries from critical service providers for

RIX-RTGS, through more structured processes for supplier management, in turn leading to mitigated risks. The continuity plan for RIX and its associated arrangements address various scenarios, ranging from simpler alternative routines to more complex and wide-scale disruptions, including intersite switchovers and cyber security incidents. All continuity arrangements are subject to periodic testing, and any appropriate adjustments to the business continuity plans and associated arrangements are made, based on the results of the testing exercises. Exercises with cyber related scenarios have been performed internally as well as with RIX participants.

There are no contingency procedures for payments in RIX-INST.

Access (Principles 18-20)

The Riksbank has participation criteria that are clear, fair and publicly disclosed. It also monitors participants on a regular basis. The Terms and Conditions clearly state the rights and obligations of the Riksbank and participants in the case of a termination, suspension or exclusion. The Riksbank performs, on a regular basis, analysis of activity in the payment system by indirect participants to evaluate the risk involved. If necessary mitigating activities will be applied.

Efficiency (Principles 21-22)

The RIX system has been adapted to meet the needs of its participants and of the Swedish market. The Riksbank monitors its costs and is transparent toward RIX participants about the costs and fees for using the system. RIX uses common networks and standard messages for all payments and for information to its participants.

Transparency (Principle 23)

The Riksbank publishes the information necessary to allow participants to understand the risks and costs associated with participating in RIX.

2 General Description

The essentials of the RIX system and its two services, RIX-RTGS and RIX-INST, are presented in an overview.

2.1 The RIX system

The designated settlement system RIX, consists of two services, RIX-RTGS the large value payment system for Swedish krona and RIX-INST a settlement service for instant payment in Swedish krona. RIX is owned and operated by Sveriges Riksbank, the Swedish central bank. It is the hub of the Swedish payment system; all transactions between banks, clearing organisations and other agents eventually pass through RIX. It therefore plays a central role in the Swedish financial system.

Since February 2009, RIX-RTGS has been running on the current RTGS platform. It is a standard system that has been further developed to meet the Riksbank's and participants' requirements for functionality and efficiency.

RIX-INST was launched in 2022 and offer settlement of instant payment in Swedish krona 24/365. To provide the service, the Riksbank uses the technical platform developed by the Eurosystem for the TARGET Instant Payment Settlement (TIPS) service.

The Riksbank has a policy of full cost recovery for RIX services which means that fees charged to participants must cover all of the Riksbank's costs for the operation of RIX. The requirement for full cost coverage is measured over a three-year period, in which revenues are to correspond to 100 per cent of costs +/- 10 per cent.

The Riksbank is also a participant in RIX-RTGS, and pays the same charges for its use of RIX-RTGS as other participants. Each service has its own price list, both lists follow the same pricing model that consists of four major parts: (i) a fixed monthly fee that is the same for all participants in each service; (ii) a fixed monthly fee for all participants that have the possibility of exercising their right to credit in RIX-RTGS through a grant of pledge; (iii) an additional fee that is divided among those RIX participants with annual domestic revenues, according to the Swedish Bankers' Association's compilation, in excess of SEK 1 billion; and (iv) a fee per payment order. In addition, there is an entry fee for new RIX participants. The fees are revised annually and current fees are published on the Riksbank's website.

Table 1. Charges for the RIX system as of 1 March 2022¹

Charges for RIX-RTGS	Amount
Fixed monthly fee <i>All institutions</i>	SEK 75,000
Fixed monthly fee <i>All institutions with the possibility to exercise their right to credit in RIX through a grant of pledge</i>	SEK 20,000
Additional fee paid monthly <i>Institutions with "domestic revenues" of at least SEK 1 billion, to be divided between these institutions based on their individual "domestic revenues"</i>	SEK 6,000,000
Fee per settled payment instruction	SEK 4.00
Charges for RIX-INST	Amount
Fixed monthly fee <i>All institutions</i>	SEK 50,000
Additional fee paid monthly <i>Institutions with "domestic revenues" of at least SEK 1 billion, to be divided between these institutions based on their individual "domestic revenues"</i>	SEK 1,000,000
Fee per sent Payment Instruction	Corresponding 0.002 Euro in Swedish Krona
Fee per sent positive answer to a Recall	Corresponding 0.002 Euro in Swedish Krona
Administrative charges for RIX	Amount
Entry fee including certification for one Settlement Service	SEK 160,000
Fee for certification of an additional Settlement Service	SEK 100,000

Source: The Riksbank.

2.2 Participants

RIX-RTGS has, per November 2022, 42 participants. Two are the Swedish National Debt Office and the Riksbank itself and seven are central securities depositories or clearing organisations. The rest are credit institutions, of which nine are non-domestic participants.

RIX-INST has per December 2022 no participants. However, 11 participants which of all participants are credit institutions are planned to be activated in production in beginning of 2023.

The access criteria for participation in RIX are stipulated in the Terms and Conditions . The qualifying criteria for an institution to be admitted as a participant include compliance with capital adequacy and large exposure requirements applicable within the Eu-

¹ Price list for RIX 2022, <https://www.riksbank.se/globalassets/media/rix/svenska/2022/andringar-villkor-for-rix/avgifter-for-rix-systemet-fran-1-mars-2022.pdf>

ropean Economic Area (EEA), being subject to supervision, having an appropriate organisation, necessary systems and routines for risk management and secure technical systems. In addition, the institution shall have a valid and appropriate license. An institution with its registered office outside Sweden must be prepared to provide a legal opinion as evidence that the Terms and Conditions for RIX are legal, valid and binding on them in their jurisdiction. There are technical and communication requirements for RIX participants to ensure that they can use the system properly.

2.3 Participation in RIX

An institution that complies with the Riksbank's access criteria can apply to be a participant in RIX. The institution then needs to be certified for each of the settlement services it intends to use. It is possible for an institution to participate in both services or in one of them.

Payments in RIX take place by debiting and crediting the RIX participants' accounts, the same applies for payments in both RIX-RTGS and RIX-INST. No payment can be sent between the services, RIX-INST and RIX-RTGS, in order for the institutions' to move money they need to initiate a Liquidity transfer.

Participation in RIX-RTGS

The Riksbank opens a Settlement Account for the RIX participant, who then becomes an Account Holder. A Loan Account is also opened for the Account Holder if a RIX participant has a right to Credit. The Settlement Account is mainly used for crediting and repayment of the Intraday Credit received within the framework of the credit facility and debit of interests and fees. It is also possible to use the Settlement account to settle immediate transactions, with or without the use of credit. In addition, the Riksbank opens additional accounts, LOM Accounts for the Settlement Procedures in which the Account Holder chooses to participate. It is not mandatory to have a principal account assigned if the participant will only act as an agent. In this case, the Riksbank will only provide an additional LOM account for the specific Settlement process. A RIX-RTGS participant may choose to commission another RIX-RTGS participant to handle its payments in RIX-RTGS.²

Participation in RIX-INST

The Riksbank opens one or more Settlement Accounts for each RIX-INST Participant, who then becomes an Account Holder. A RIX-INST Participant can by power of attorney appoint another actor to send and receive information to and from RIX-INST in their place. The actor then acts as Instructing Party for the RIX-INST Participant. The Riksbank has no formal relationship with the Instructing parties. A RIX-INST Participant that does not participate in RIX-RTGS shall have an agreement with a RIX-RTGS Participant, whose account in RIX-RTGS may be used for debiting fees and any interest

² The Riksbank must approve RIX participants that offer this service.

applicable to the RIX-INST Participant. The RIX-RTGS participant also has to agree to transfer liquidity to the RIX-INST Participant's account in RIX-INST.

2.4 Credit and collateral

It is only possible to use collateral for credit in RIX-RTGS. RIX-RTGS participants that have credit agreements with the Riksbank may receive intraday credit against collateral which meets the Riksbank's eligibility requirements and is valued according to the Riksbank's rules for valuing collateral³. The Riksbank opens a loan account in RIX-RTGS for participants that may receive credit. The negative balance on a loan account may not exceed the credit limit registered at that time. The credit limit is determined by the value of the collateral pledged by the participant for credit in the Riksbank.

RIX-RTGS participants may provide collateral in the form of Swedish and foreign debt securities which are held at Euroclear Sweden or in Euroclear Bank, or in the form of Danish currency (DKK) deposited in an account at Danmarks Nationalbank and Norwegian currency in an account at Norges Bank (NOK). The routines and agreements for managing the Danish and Norwegian currencies are called Scandinavian Cash Pool (SCP). It is also possible to use Euro as collateral. The euro should be paid into the Riksbank's pledged account in Deutsche Bundesbank. The administration of collateral is fully automated.

2.5 Settlement processes

RIX-RTGS

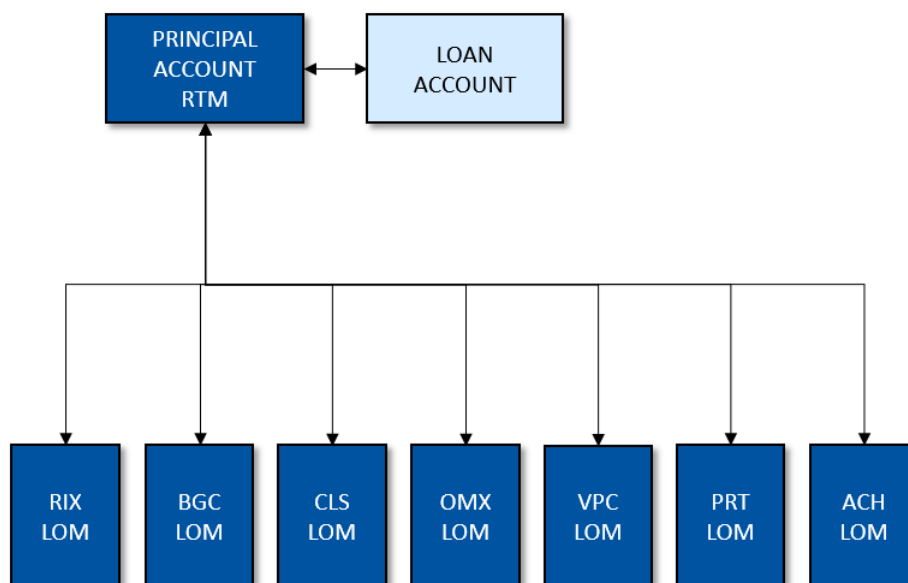
RIX-RTGS consists of eight settlement procedures, the RTM process associated with the Settlement Account and seven separate processes called LOMs, Liquidity Optimising Mechanism, which are associated with a specific account.

Payments in RTM are implemented immediately, while settlement procedures for LOMs provide functions for liquidity management, prioritisation of transfers and liquidity optimisation.

The seven different LOMs deal with transfers relating to the participating financial market infrastructures or their services.

³ Collateral Instructions, Annex H4, July 2020 <https://www.riksbank.se/globalassets/media/rix/engelska/2020/terms-and-conditions-for-rix-and-monetary-policy-instruments---annex-h4---collateral-instructions.pdf>.

Figure 1. Overview of RIX accounts and settlement procedures



RIX-RTGS is open for settlement on all Swedish Bank Days between 07:00 and 18:00. RIX's opening hours follow a specific timetable, which consists of a series of pre-determined events linked to various time intervals. These pre-determined events, in combination with the given time intervals, govern and control the Settlement Procedures, other system-generated processes and the opening hours of RIX.

RIX-INST

Settlement takes place on the accounts in RIX-INST on the condition that the payment message is correct and that there is liquidity available on the account. RIX-INST offers two different models for settlement, the Standard Settlement Model and the Single Instructing Party Settlement Model (SIP Model)⁴. Both these models offers instant settlement of Swedish krona in central bank money. RIX-INST is open for settlement 24 hours every day of the year (24/365).

2.6 RIX in statistics

On a monthly basis, the Riksbank publishes statistics on its website of the value and the number of payments settled in RIX⁵. At the time of this report there is no payments settled in RIX-INST why no statistics are available, Riksbank.se will be updated with a statistical report as soon as the market have migrated to the RIX-INST service.

⁴ For more information on the different settlement models: <https://www.riksbank.se/globalassets/media/rix/rix-inst/engelska/rix-inst-instructions.pdf>

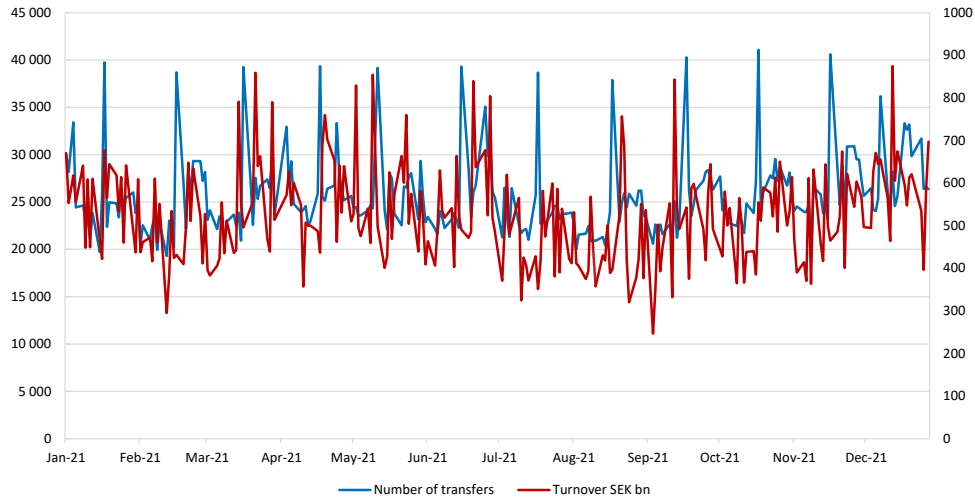
⁵ Statistics on payments in RIX: <https://www.riksbank.se/en-gb/payments-cash/the-payment-system---rix/statistics-on-payments-in-rix/>

General Description

For the whole of 2021, the average number of payments amounted to 25 607 per day and the average turnover was SEK 523 billion per day. The largest number and greatest value of payments in RIX-RTGS is settled between 09.30 and 11.00, a period that is called the Peak Period. The number of payments during the Peak Period averaged to 8 611 per day in 2021.

Chart 1. Number of payments and turnover per day in RIX-RTGS 2021

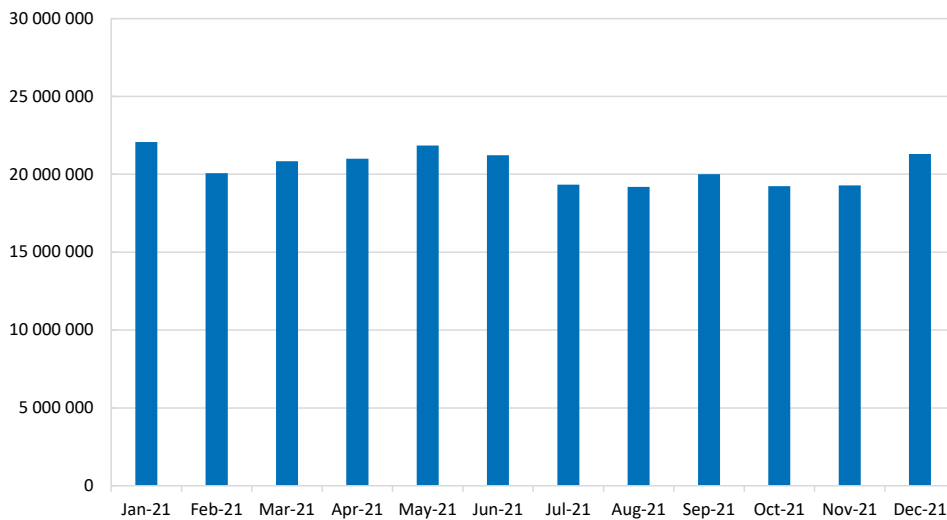
Number of payments left hand scale and turnover SEK billions right hand scale



Source: The Riksbank.

Chart 2. Average amount per transfer and month in RIX-RTGS 2021

Currency: SEK



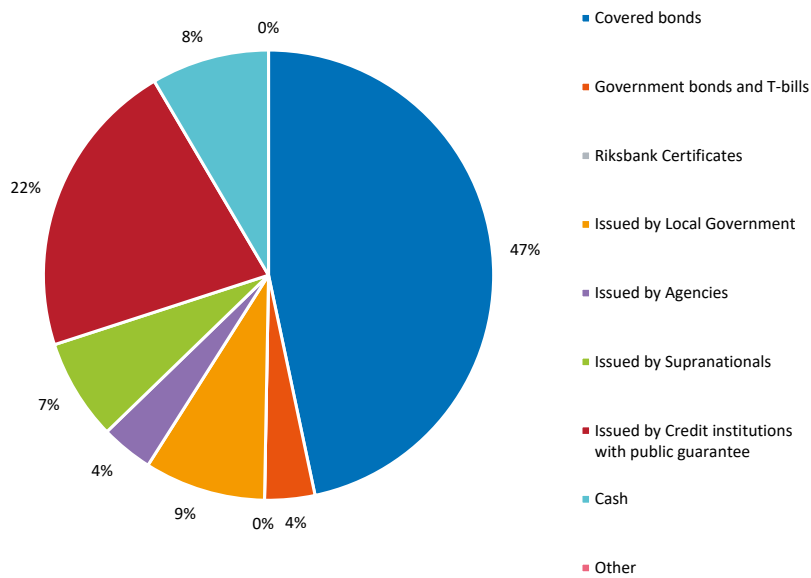
Source: The Riksbank.

Collateral and degree of utilisation

The Riksbank provides participants with information about the collateral pledged and the usage of collateral in RIX-RTGS. One measure of this is the total maximum collateral, which is defined as the total of the highest value of collateral for each RIX-RTGS participant pledging collateral. Another measure is the degree of utilisation, which is defined as the total maximum utilised credit for those institutions required to pledge collateral, as a proportion of the total maximum collateral. In 2021, the average total daily volume of the maximum collateral amounted to SEK 158 billion.

Chart 3. Pledged collateral per security type, 30 December 2021

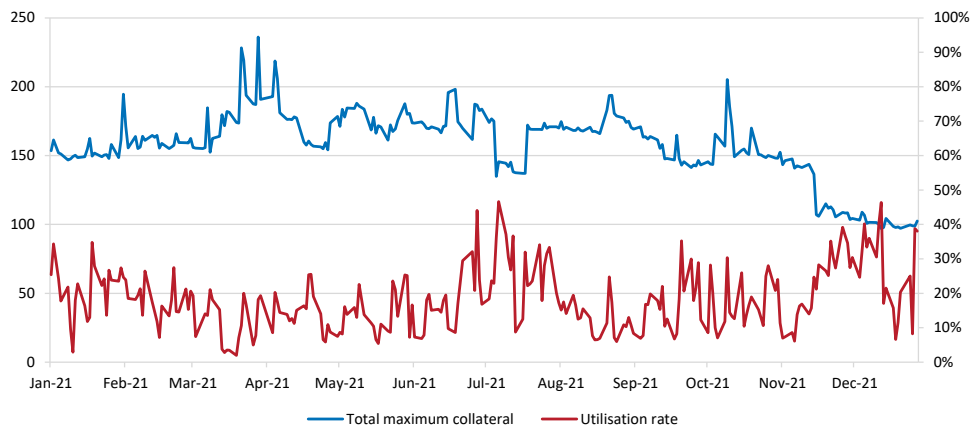
Percent of pledged collateral



Source: The Riksbank.

Chart 4. Maximum collateral and degree of utilisation 2021.

SEK billions on left hand scale and percent of utilisation right hand scale



Source: The Riksbank.

3 Summary of major changes since previous update

Since the publication of the Disclosure Framework report on the RIX-system in 2020 there has been amendments and updates both when it comes to the terms and conditions and collateral, but most important change is a new settlement service RIX-INST has been taken into production. Due to the situation with COVID-19 in 2020 special arrangements where agreed upon, see below for further information on handling operational risks in regards to COVID-19. These changes are no longer in use and routines and processes are back to be normal arrangements.

3.1 Terms and Conditions

In September 2021 changes were made to the Terms and Conditions with regards to the launch of RIX-INST, which means that RIX includes two settlement services, RIX-RTGS and RIX-INST. Certain concepts were also changed to better suit both RIX-RTGS and RIX-INST. Furthermore, structural changes, planned for some time were also introduced, as they had become even more relevant as a result of the introduction of new Terms and Conditions for RIX-INST. The structural changes consisted of keeping only the parts that cover rights and obligations between the Riksbank and the Participants in the Terms and Conditions. Other parts with detailed information about the system's function and settings were removed and made into separate documents referred to in the Terms and conditions. The changes were made to simplify the Terms and Conditions in terms of understanding and the administration that comes with amendments.

3.2 Collateral

As part of the Riksbank's actions to mitigate the effects on the pandemic on the Swedish economy In March 2020, the Riksbank decided to increase the scope for using covered bonds as collateral for credit. The Riksbank eased the limit regulations rules applied to on the use of collateral and made it possible to use covered bonds issued by the counterparties. The special limit rules that had applied to covered bonds were discontinued and a temporary, more generous rule were applied. In September 2021, the Riksbank revoked this decision and as of 3 January 2022, the limit rules on the use of collateral that applied before the pandemic were reintroduced.

4 Principle by principle

Each principle relevant for Sveriges Riksbank is described in detail. When applicable, the principles are described overall for RIX and for the two services RIX-RTGS and RIX-INST respectively.

4.1 Principle 1: Legal basis

An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.

Key conclusions

The laws, regulations and rules provide a clear and enforceable legal basis for the settlement of payments in RIX, both its RIX-RTGS service and RIX-INST service, and for the use of collateral to mitigate credit risk. The material aspects of RIX's activities requiring legal certainty are rights and interests in financial instruments, collateral arrangements and settlement finality. RIX has been designated in accordance with the Act concerning Systems for the Settlement of Obligations on the Financial Market (SFS 1999:1309) which transposes the Settlement Finality Directive (1998/26/EC) into Swedish law. An administrator of a settlement system shall, according to the previously mentioned act, establish satisfactory joint rules and standardised arrangements to execute transfer orders as well as rules which state that Swedish law is applicable.

Legal framework

To identify the jurisdictions in which RIX activities require legal support, the Riksbank has considered the jurisdictions where RIX participants are domiciled, the jurisdiction which governs the rules of the system and the jurisdiction under whose law securities are held as important for RIX. RIX participants have their domicile in Sweden, Norway, Belgium, England, Finland, Denmark, France, the United States, Luxemburg, Malta and the Netherlands (August 2022)⁶. The Riksbank operates the RIX system within Sweden for payments in SEK and Swedish law governs the Terms and Conditions. However, when a participant is domiciled outside Sweden, foreign laws may apply, for example in case of a participant's bankruptcy. Most collateral is held under Swedish law. However, foreign securities are accepted as collateral in RIX according to Belgian law.

The principal laws forming the legal framework for the payment and settlement systems infrastructure in Sweden and relevant for RIX are:

⁶ <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/participating-in-rix/deltagare-i-rix/>

- The *Sveriges Riksbank Act (Lag (1988:1385) om Sveriges Riksbank)*. This Act states that the Riksbank shall, inter alia, “promote a safe and efficient payment system.” The Riksbank may make available systems for settlement of payments and in other ways participate in the settlement of payments. It may also grant intraday credit to participants in the system against adequate collateral. A credit institution or any other company supervised by Finansinspektionen, the Swedish Financial Supervisory Authority, has an obligation, upon the request of the Riksbank, to provide the Riksbank with such information as the Riksbank considers necessary in order to oversee the stability of the payment system.
- The *Act concerning Systems for the Settlement of Obligations on the Financial Market (Lag (1999:1309) om system för avveckling av förpliktelser på finansmarknaden)*. This Act is based on the EU Directive on settlement finality in payment and securities settlement systems (SSS) (98/26/EC). The Act stipulates that a payment order in relation to a third party shall be honoured even if insolvency proceedings have been initiated against a participant in a notified settlement system, provided the payment order was entered (*Sw. införd*) in the system prior to notification of the court’s decision to initiate insolvency proceedings. The Act also prohibits revocation of a payment order by a participant in a notified settlement system or by a third party after the time stipulated in the regulations that apply to the system. RIX has been notified to ESMA⁷ as a system within the scope of Settlement Finality Directive.
- The *Swedish Central Securities Depositories and Financial Instruments Accounts Act (Lag (1998:1479) om värdepapperscentraler och kontoföring av finansiella instrument)*. This Act regulates the registration of ownership of both dematerialised financial instruments and those material instruments which have been taken out of circulation. The responsibility for maintaining the ownership register is assigned to a CSD, which is granted authorisation by Finansinspektionen.
- The *Financial Instruments Trading Act (Lag (1991:980) om handel med finansiella instrument)*. This Act regulates collateral issues as set out in the Financial Collateral Directive (2002/47/EC) including, but not limited to, provisions regarding use in case of security financial collateral arrangements.

⁷ The European Securities and Markets Authority

- The Resolution Act (*Lag (2015:1016) om resolution*). This act implements the Directive 2014/59/EU of the European Parliament and of the Council of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms. This Act sets out a special procedure to manage banks, other credit institutions and securities companies in distress without declaring it bankrupt whilst also minimising the cost to taxpayers. In resolution, the resolution authority takes control of such an institution with the aim of sustaining all or parts of its operations and of maintaining financial stability by way of, inter alia, writing down such an institution's liabilities to absorb losses or to convert liabilities into equity to recapitalise the institution in a certain order of priority, entailing that this Act affects in which manner the Riksbank can operate as an FMI in the event a RIX participant is declared to be in resolution.
- The *Rights of Priority Act (Förmånsrättslag (1970:979))* stipulates that a pledgee that has been registered in accordance with the Financial Instruments Accounts Act has a specific right of priority to the pledged financial instruments before other creditors in the event of the pledgor's bankruptcy and/or execution of the pledgor's debt. This Act, together with the Bankruptcy Act referred to below and the Swedish Enforcement Code (*Utsökningsbalken (1981:774)*), states the rights and obligations for the Riksbank in the case of a defaulting RIX participant.
- The *Bankruptcy Act (Konkurslag (1987:672))* enables a pledgee to sell, without delay, any financial instruments that it holds as collateral, as long as this is done in a commercially acceptable manner.
- The *Contracts Act (Lag (1915:218) om avtal och andra rättshandlingar på förmögenhetsrättens område* constitutes the legal basis for handling financial contracts and transactions in Sweden and sets forth certain rules under which an otherwise binding agreement or other legal act can be altered or declared void on the grounds of duress, fraud, deceit or usury. Also, pursuant to this Act any agreement or a contract term may be modified or set aside to the extent necessary to avoid unreasonable results, even if the circumstances giving rise to those results arise after the agreement is entered into or the contract term is incurred.

Terms and Conditions

The central rules, procedures and contracts for RIX are included in the Terms and Conditions and accompanying annexes⁸. To ensure that the Terms and Conditions provide a high degree of certainty even when a participant is domiciled in another jurisdiction, the Riksbank requests that all participants shall have a valid legal status and the capacity to assume with binding effect the rights and obligations of the Terms and Conditions. Foreign participants have to provide a legal opinion to evidence that the Terms and Conditions for RIX are legal, valid and binding on them in their jurisdiction.

⁸ <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/participating-in-rix/how-to-become-a-rix-participant/>.

The moment of finality of a Funds Settlement Instruction in RIX is defined in the Terms and Conditions Master Document, Chapter C⁹ on irrevocability and finality and is the time of crediting of the receiving RIX participant's account.

There are certain parts of the Terms and Conditions that relate specifically to RIX-RTGS and RIX-INST respectively.

Foreign entities may participate in RIX. All participants shall have valid legal status and the capacity to assume with binding effect the rights and obligations of the Terms and Conditions.¹⁰ Enforcement issues may arise should a foreign participant become insolvent and such insolvency proceedings are governed by the laws of its home jurisdiction. This risk is minimised by requiring foreign participants to provide a legal opinion. The Riksbank employs legal experts to draft and review its rules, procedures and contracts. Should new foreign participants join RIX or new collateral arrangements be established, the enforceability and degree of certainty for rules and contracts are analysed and legal opinions sought on a case-by-case basis.

The Terms and Conditions are governed by Swedish law and the settlement services provided by RIX are conducted in Sweden although the technical platform used for the RIX-INST service is operated outside of Sweden. Conflicts of law could arise due to the presence of foreign participants and in conjunction with the use of foreign collateral for RIX. The risk of conflicts of law arising in taking collateral is reduced by the fact that most countries which are relevant for the Riksbank's collateral have implemented the Collateral Directive¹¹. In addition, in considering custody arrangements for its foreign collateral, the Riksbank analyses the protection of its rights as a pledgee in the relevant jurisdictions.¹² Should the analysis find any areas of uncertainty, the Riksbank will seek a legal country opinion.

⁹ Section 1.5.5 with regard to RIX-RTGS and Section 2.4.5 with regard to RIX-INST, Terms and Conditions for RIX and monetary policy instruments, <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/conditions-and-instructions/>

¹⁰ <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/conditions-and-instructions/>.

¹¹ See Directive 2002/47/EC of the European Parliament and of the Council of 6 June 2002 on financial collateral arrangements and Directive 2009/44/EC of the European Parliament and of the Council of 6 May 2009 amending Directive 98/26/EC on settlement finality in payment and securities settlement systems and Directive 2002/47/EC on financial collateral arrangements as regards linked systems and credit claims, http://ec.europa.eu/internal_market/financial-markets/collateral/index_en.htm#directive

¹² The links currently accepted by the Riksbank are those which have been assessed by the Eurosystem. A key element in that assessment is the analysis of legal soundness in link arrangements. In considering how it would assess new links, the Riksbank plans to use the Eurosystem assessment methodology as a starting point and to put emphasis on legal soundness. Standards for the use of EU securities settlement systems in ESCB credit operations, January 1998. <http://www.ecb.int/paym/coll/coll/sslinks/html/index.en.html>.

4.2 Principle 2: Governance

An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.

Key conclusions

Promoting a safe and efficient payment system is one of the main objectives of the Riksbank and thus governs its operation of the payment system RIX. The governance arrangements at the Riksbank, including the responsibilities of the Executive Board and the management, are either determined by law or described in publicly available documents. The responsibilities for establishing and implementing the risk management framework for the Riksbank as a whole and for the payment system are specified in these governing documents. As a result, the public interest aspects of operating a large value payment system are integrated into the work of the Riksbank. The division of responsibilities within the Riksbank clearly separates the responsibility for operating RIX from the oversight functions. The three lines of defence model implemented ensures efficient risk management, internal control and clear roles and responsibilities.

RIX consists of RIX-RTGS, which is fully owned and operated by the Riksbank, and RIX-INST, which is a service provided by the Riksbank using a platform owned and operated by the Eurosystem¹³. Due to the fact that the RIX-INST service is using a platform that is owned by other central banks the Riksbank is not in control of the platform and is not represented in the final decision-making body. However, the Riksbank is represented in other forums where the Riksbank's point of view can be raised.

In the operation of RIX and planning for its long term development, participants are also given the opportunity to provide input, both in projects concerning RIX and through different fora.

The General Council and the Executive Board

The Riksbank is a public authority directly under the Riksdag (the Swedish Parliament).¹⁴ The Riksbank is governed by a General Council and an Executive Board. The General Council is made up of eleven members appointed by the Riksdag. The Sveriges Riksbank Act specifies the responsibilities of the General Council as activities pertaining to the appointment and conditions for members of the Executive Board, decisions about the design of notes and coin, distribution of the Riksbank's profits, audits and opinions within the Council's area of responsibility. The General Council shall also

¹³ The national central banks of the countries having Euro as their currency and the European Central Bank.

¹⁴ <https://www.riksbank.se/en-gb/about-the-riksbank/>.

check and monitor that the Riksbank's operations fulfil the Riksbank's goals and that the Riksbank manages its risks.¹⁵

The Executive Board of the Riksbank is responsible for the Riksbank's operations including the payment system and its work on financial stability. In managing the Riksbank's operations, the Board is responsible for ensuring that operations are efficient, reliable and fair. It is also responsible for good governance and control.¹⁶ Moreover, the Board decides the financial risk policies for the Riksbank¹⁷ and is responsible for setting the policies and leading the work to achieve these goals. In the Instruction for Sveriges Riksbank, the Board has delegated certain activities to the Riksbank's department heads¹⁸.

The Sveriges Riksbank Act requires that the Executive Board of the Riksbank submit an annual report to the Riksdag comprising a Profit and Loss Account, a Balance Sheet and a Directors' Report. The Directors' Report shall contain an account of foreign exchange and monetary policies and of how the Riksbank has promoted a safe and efficient payment system. On the basis of the annual report, the Riksdag determines whether the General Council and the Executive Board can be discharged from liability for the management of the Riksbank. Such a discharge can only be denied if a member of the Executive Board has committed a crime or if there is reason to make claims of financial liability against a member. A denial of discharge of liability is reason for dismissal from the board.

The Sveriges Riksbank Act does not specify the skills or requirements for a member of the Executive Board of the Riksbank except to specify that the prospective member may not be a member of the Riksdag, be a Cabinet minister, be employed at the Government Offices, be employed by the central administration of a political party, be a member or deputy member of a board of directors of a bank or any other company subject to supervision by Finansinspektionen or hold any other employment or assignment which makes the candidate unsuitable as member of the Executive Board. The requirements are designed to minimise conflicts of interest.

The Rules of procedure provide a more detailed specification of the Executive Board's responsibilities and the Instructions specify the issues about which the Board will decide together with the responsibilities delegated to the heads of departments. The procedures for meetings of the General Council and the Executive Board are specified in the governing documents. There are no sub-committees. The minutes of the meetings of the General Council and the Executive Board are public.

To decrease the risk of conflicts of interest, there are requirements for members of the General Council and Executive Board that i.a. prohibit them from being on the

¹⁵ The Sveriges Riksbank Act (Lagen (1988:1385) om Sveriges riksbank) - / <https://www.riksbank.se/en-gb/about-the-riksbank/policy-documents/the-sveriges-riksbank-act/>.

¹⁶ Rules of procedure for Sveriges Riksbank, Article 3, 1 November 2022. [Rules of procedure for Sveriges Riksbank](https://www.riksbank.se/en-gb/about-the-riksbank/policy-documents/rules-of-procedure-for-sveriges-riksbank/)

¹⁷ Instructions for Sveriges Riksbank, Article 5, 1 November 2020, (Appendix). <https://www.riksbank.se/en-gb/about-the-riksbank/policy-documents/rules-of-procedure-and-instructions-for-sveriges-riksbank/>.

¹⁸ <http://www.riksbank.se/en-gb/about-the-riksbank/policy-documents/rules-of-procedure-and-instructions-for-sveriges-riksbank/>.

board of financial institutions and prohibit a direct transfer to employment at a financial institution.

Evaluation of goals

To assess how the operation of the RIX system contributes to meeting the Riksbank's objective of promoting a safe and efficient payment system, the Riksbank has established concrete measurable operational objectives.

For RIX-RTGS these are:

- Technical availability of 99,85%
- Full cost recovery

In its annual report the Riksbank publishes the result on how the system meets the objectives of RIX.¹⁹ Stability and efficiency are, by law, the overriding objectives of the Riksbank in providing the payment system. The Riksbank works to identify public interest aspects in the payment system, requests the views of other governmental agencies and provides RIX participants with the opportunity to highlight any of their interests which may be at stake. The Riksbank has a close collaboration with the ECB who is responsible for the TIPS platform used for RIX-INST as well as the TARGET system.

Internal organisation

The organisation and governance at the Riksbank is designed so that much responsibility and decision making takes place at the department level whilst the audit and control functions review according to the Three Lines of Defence are separated in different departments. In this way, conflicts of interest are reduced. Moreover, the existence of conflicts of interest is a central element which the Riksbank's auditors examine in judging operations and risk management.

The operation of RIX is the responsibility of the Head of the Payments Department. The department head has been given the responsibility for running the system, ensuring that collateral is adequate, staffing the system, determining the rules of the system and ensuring that all matters that the Executive Board must decide on are raised to the Executive Board. The regulations for accepted collateral are maintained and decided by the Markets Department. The responsibility for oversight of the payment system is assigned to the Head of the Financial Stability Department. Thus, the operations of RIX and the Riksbank's oversight functions are in separate departments so day-to-day decisions are taken by different Department Heads. In this way, the oversight function is independent of the operational function.

The Head of the Payments Department is accountable to the Executive Board of the Riksbank. The General Council has the task of regularly monitoring the Riksbank's activities and how the Executive Board manages them. One way of monitoring is via the

¹⁹<https://www.riksbank.se/en-gb/press-and-published/publications/annual-report/>.

Council Chair and Vice-Chair having the right to attend Executive Board meetings, although they are not allowed to submit proposals or take decisions in order not to jeopardise the Riksbank's independence. The General Council also has an audit unit that, among other things, examines how the Executive Board members exercise their duties. The work is carried out by a chartered accountant.²⁰ The senior management of the Riksbank is chosen by a decision of the Executive Board. The Sveriges Riksbank Act requires that the Riksbank has a staff disciplinary board chaired by the governor.²¹ This board is also responsible for dismissing senior management if this should be necessary.

The Instructions for Sveriges Riksbank assign the Head of the Payments Department the responsibility for operating the Riksbank's system for transferring payments by account (RIX) and managing the collateral required by the Riksbank for its payment system and monetary policy credits.²² The Head of the Payments Department has then delegated to the Head of the Payment System Division the responsibility to design the working procedures for those operating the RIX systems and collateral management and to run the systems used for these tasks.

RIX as a FMI has its own policy for governance and control of RIX.²³ The policy's aim is to make sure that the Head of the Payments Department has mandate and is responsible for the management and follow-up activities related to RIX as a financial infrastructure. RIX has its own management team consisting of the Head of the Payments Department, the head of the RIX unit and representatives from other²⁴ operational units. Internal audit and Risk department are co-opted members. The aim of the management team of RIX as a FMI is to make sure the goals of RIX as a FMI are met. The goals are:

- To follow up on operations of RIX
- To follow up on the budget and business plan for RIX
- To follow up on, prevent and mitigate risks occurring in relation to RIX
- To ensure that RIX is compliant with the principles for financial market infrastructures (PFMI)

The management team is to act as support to the head of the Payments Department. The head of the Payments Department decides upon the cross-departmental regulation for steering and follow-up of RIX.

²⁰ The General Council [The General Council | Sveriges Riksbank](#)

²¹ The Sveriges Riksbank Act Chapter 9 Article 6 <https://www.riksbank.se/en-gb/about-the-riksbank/policy-documents/the-sveriges-riksbank-act/>

²² Instructions for Sveriges Riksbank, appendix, only in Swedish, Instruktion för Sveriges Riksbank, <https://www.riksbank.se/en-gb/about-the-riksbank/policy-documents/rules-of-procedure-and-instructions-for-sveriges-riksbank/>

²³ In Swedish Policy för styrning och uppföljning av RIX, <https://www.riksbank.se/sv/om-riksbanken/styrdokument/policy-for-styrning-och-uppfoljning-av-rix/>

²⁴ The Head of Corporate Services department, Head of Markets department. Chief Risk Officer, Chief Compliance Officer and Head of Internal audit participate if necessary.

The governance arrangements of the Riksbank are documented primarily in the Instrument of Government; The Sveriges Riksbank Act; The Rules of Procedure and the Instructions. These documents are publicly available at the Riksbank's website. Whilst the Instrument of Government and The Sveriges Riksbank Act are legislated by the Riksdag, the General Council of the Riksbank determines the Rules of Procedure and the Executive Board of the Riksbank establishes the Instructions. In addition, the Riksbank has policies, rules and routines which complement those documents. The policies, rules and routines are, in accordance with Swedish law, available upon request unless they contain confidential information.

Management of risks

The Executive Board of the Riksbank has established the policies for the Riksbank including one for financial risk, one for internal control and one for operational risk. The policy for operational risk and the risk section in the RIX policy establishes that the Riksbank has a low tolerance for operational risks and that any risks deemed to be significant should be eliminated. The rule for operational risk specifies procedures and controls to identify and reduce operational risks. According to these policies and this rule, the Head of Payments Department is responsible for identifying, analysing and mitigating any operational risks associated with RIX and its collateral management. The Executive Board of the Riksbank has made the Head of Payments Department responsible for managing the risks which arise in the operation of RIX, subject to the limitations on financial risk in granting intraday credits stated in the Sveriges Riksbank Act.²⁵ This includes decisions related to crisis management. The Head of Payments Department is responsible for the routines and policies for managing crises, described in the Terms and Conditions and in the crisis management plan. According to the internal Policy of governance and control of RIX²⁶ which aim is to, in more detail clarify what applies to the internal governance of RIX, the risk of events that may affect availability, accuracy or confidentiality in RIX should be low and the resilience to events that affect this should be high. Identified risks must be evaluated, limited and addressed continuously and in a structured way.

The policies for financial risk and internal control are reviewed by the Risk Division at least once a year (see Principle 3). If there is any need for change, such changes are brought to the attention of the Executive Board. The Risk Division is the risk management function of the Riksbank. Organisationally, it is situated in the Corporate Services Department. The Head of the Risk Division is appointed by the Executive Board. In addition to e.g. drafting policies to manage risks, providing expert advice to managers of Riksbank operations, the Risk Division provides the Executive Board with reports three times a year which monitor the Riksbank's risks and risk management. The risk management methods and models are determined by the Risk Division. The Head of the Risk Division shall determine the methods and measures used to quantify and monitor the Riksbank's risks in accordance with the guidelines established by the Ex-

²⁵ Executive Board of the Riksbank, Instruction for Sveriges Riksbank, in Swedish, <https://www.riksbank.se/globalassets/media/riksbanken/lagar-regler--policy/instruktion-for-sveriges-riksbank.pdf>

²⁶ Policy för styrning och uppföljning av RIX, in Swedish, <https://www.riksbank.se/sv/om-riksbanken/styrdo-kument/policy-for-styrning-och-uppfoljning-av-rix/>

ecutive Board in the operational risk policy and the Financial risk- and investment policy. In the financial risk documents, the models or methods for measuring liquidity, market and credit risk are established. In order to validate the models and methods used for risk monitoring, the Risk Division regularly back tests according to market standards and apply stress tests to verify their robustness. It monitors developments in risk management and reviews the Riksbank's models and methods in light of these developments.

To ensure effective risk management and internal control the Riksbank applies the Three Lines of Defence model. The Three Lines of Defence model constitutes of:

- The first line, which is the Head of the Payment Department who is responsible for managing these risks, monitors the risks and sees that policies are implemented correctly;
- The second line of defence is the Risk Division, which provides advice in implementing procedures and reviews the risk management in the first line;
- The third line of defence is the focus of the internal and external auditors on risk management at the Riksbank.

Audit

The Riksbank is audited on three separate levels. The General Council has an audit function to monitor that the Executive Board of the Riksbank is following all relevant laws and meeting its responsibilities.²⁷ The General Council determines the extent of these audits independently. The General Council's auditor reports directly to the General Council.

The Executive Board has the responsibility granted by the Sveriges Riksbank Act to ensure that the Riksbank has internal governance and control that functions adequately.²⁸ The Sveriges Riksbank Act also prescribes that the Riksbank shall have an internal audit function which shall monitor all aspects of the Riksbank's internal governance and control.²⁹ The audit function at the Riksbank is a separate department directly under the Executive Board. The Executive Board determines the scope and extent of the audits. The internal audit function reports directly to the Executive Board. The Executive Board is assigned the responsibility to determine how any observations or recommendations from the audit should be implemented. The Governor of the Riksbank is assigned to follow up those implementation decisions. In addition, Riksrevisionen, the Swedish National Audit Office, assesses the Riksbank's annual report, carries out the investigations which it deems necessary to assess that report and may carry out additional audit activities according to its plan. The Swedish National Audit Office is independent from the management of the Riksbank and, by law, has the right

²⁷ The Sveriges Riksbank Act (Lagen (1988:1385) om Sveriges Riksbank) Chapter 9 Article 2.
<https://www.riksbank.se/en-gb/about-the-riksbank/policy-documents/the-sveriges-riksbank-act/>

²⁸ The Sveriges Riksbank Act (Lagen (1988:1385) om Sveriges Riksbank) Chapter 9 Article 1a.
<https://www.riksbank.se/en-gb/about-the-riksbank/policy-documents/the-sveriges-riksbank-act/>

²⁹ The Sveriges Riksbank Act (Lagen (1988:1385) om Sveriges Riksbank) Chapter 9Aarticle 2a.
<https://www.riksbank.se/en-gb/about-the-riksbank/policy-documents/the-sveriges-riksbank-act/>.

to determine the focus of its audits and to obtain all documentation necessary to perform them.

Governance of the RIX system

The Riksbank works to take the interests of participants, their customers, potential users and the general public into account in its decisions about the RIX system. Information and discussions about strategic issues and major decisions pertaining to the RIX system are discussed at the RIX Council. The RIX Council consists of representatives from each of the three major Swedish banks (SEB, Svenska Handelsbanken, and Swedbank), Bankgirot (the Swedish ACH), Euroclear Sweden (the Swedish CSD), the Swedish National Debt Office, two foreign-owned banks branches (Danske Bank and Nordea Bank Abp filial Sverige) and a mid-sized bank (Länsförsäkringar Bank) as well as a representative of the Swedish Bankers' Association. Concrete issues related to operations and technical issues are discussed at the RIX User Group which is open to representatives of all RIX participants. All suggested changes to the Terms and Conditions are sent out to participants for comment and are made public. These comments are explicitly taken into account in decisions about the Terms and Conditions.

All major decisions about the RIX system are published, as are all major decisions taken by the Executive Board of the Riksbank on the Riksbank's website. This would include major investment decisions or decisions related to the organisation of the Riksbank. As described above, RIX participants and the general public are consulted on all material amendments to the Terms and Conditions for RIX. Major decisions related to the operations of the system are presented to participants of the RIX User Group. They are also published, where relevant, in the web-material for the RIX system and are described for users both before and after the fact in the four monthly reports.

Conflicts of interest

Conflicts of interest can arise as a result of conflicting objectives within the Riksbank, conflicts between the interests of individual participants and the system as a whole and between RIX participants and their customers or potential participants. The Riksbank relies on transparency and consultation to mitigate these conflicts of interest. Decisions about the system are subject to consultation within the Riksbank.

RIX-INST

The RIX-INST service is using the TARGET Instant Payment Settlement (TIPS) platform. Hence, the Riksbank is depended on that platform and its evolvement for the long-term provision of the RIX-INST service. The TIPS platform is owned and operated by the Eurosystem. The Riksbank is the current representative for the non-euro currencies central banks, using the TIPS platform, in the body that is responsible for the day to day operations, the Market Infrastructure Board (MIB) of the European Central Bank. This might change if more non-euro currencies will use the TIPS platform since the participation in MIB will circulate between the non-euro currency central banks.

However, the Riksbank is not represented in the final decision-making body, the Governing Council of European Central Bank. There are however additional bodies where potential differences of opinion could be mitigated, the TIPS non-euro Currency Steering Group and a Governors' Forum.”

4.3 Principle 3: Framework for the comprehensive management of risks

An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operation, and other risks.

Key conclusions

The Riksbank has a framework for identifying, monitoring and managing the risks which arise in the operation of RIX. The Riksbank has procedures for reporting and following up these risks which are adequate and ensure that those responsible have sufficient information to make decisions about risk management. The Riksbank considers the risks it bears from service providers in its operational risk management. It provides information to participants and works with them and in particular with systems dependent upon RIX to promote a secure and efficient use of the system. The Riksbank has a close collaboration with the Eurosystem which provides and operates the TIPS platform, used for the settlement service RIX INST. The Riksbank works with the Swedish financial market to establish routines which can mitigate the effect of widespread crisis scenarios on the Swedish market.

Operational risk

The Riksbank has a framework for identifying, monitoring and managing the risks which arise in the operation of RIX. The process is documented in the Policy for operational risk.

The first step of the process is risk identification. The Riksbank has identified operational risk, including legal risks, as a major risk area in RIX) and the one which is most difficult to manage (see Principle 17), other risks identified are credit and liquidity risks. The Executive Board establishes the policy for internal control, the policy for operational risk, the financial and investment policy as well as the policy for RIX. The Riksbank's operational risk policy establishes the level and types of operational risk which can be accepted. In order to manage operational risks according to the risk framework, the Riksbank has defined a risk identification process which covers all activities including the operation of RIX annually or in association with any changes. All risks associated with these activities are identified, assessed and any action plans are reviewed at least once every four months (see Principle 17). The Riksbank has also established a process for documenting, grading and following up operational incidents. Information on incidents serves as an input for the annual risk control self-assessment. Incidents may result in new identified risk or indicate weak controls. The Head of the Payment Department reviews the risk control self-assessment and decides, based on the guidelines in the Riksbank's operational risk framework, whether the operational risks which have been identified should be accepted, mitigated or avoided. Any risks with a possible major impact on RIX or the operations of RIX should be addressed by the management team of RIX. The management team of RIX should on a tertial basis follow up on identified risks, the assessments of the identified risks, the actions taken or planned to limit and mitigate the risks. The management team of RIX

is also responsible for the assurance of a yearly risk analysis of RIX as system and FMI being done.

A main source of risk considered in the analysis of RIX is the interdependencies between systems in the sector.. As part of its annual review of operational risks, the Riksbank evaluates the risks it bears from other entities. It identifies and assesses the risks which it faces from service providers and providers of messaging and telecommunications services. To evaluate the risks which RIX poses to its participants, the Riksbank considers the criticality of different payments in RIX. In particular, it has identified the payments in RIX RTGS to and from clearing houses (including CLS Bank), the securities settlement system and central counterparties, all settled in RIX-RTGS, as particularly critical.

The Riksbank also works actively with actors in the Swedish financial market in the Finansella Sektorns Privat-Offentliga Samverkansgrupp (FSPOS), a group made up of government agencies and financial market actors with the support of MSB, the Swedish Civil Contingencies Agency, which works to improve the resilience of the financial sector.³⁰ A major focus of this group is interdependencies among financial actors and common dependencies upon service providers. Furthermore, the Riksbank administers a coordination group called Krissamverkan för det centrala betalningssystemet with the purpose of facilitating information exchange in case of system disruptions.

The risks from IT-system providers and providers of messaging and telecommunications services are considered as part of the Riksbank's regular management of operational risk. To reduce the degree of dependence, the Riksbank works to maintain redundancy and contingency routines. In the case of messaging services, the Riksbank requires that participants have two ways of sending messages to the Riksbank. To mitigate the risks associated with the dependency on IT-system providers, the Riksbank has strict requirements for the service which the IT-provider would deliver and on the IT-provider's security. The Riksbank checks to ensure that these demands are met by carrying out regular meetings and on-site visits. In addition, the Riksbank protects itself by rigorous testing of all deliveries from the service provider.

For the RIX INST service the Riksbank has a close collaboration with the Eurosystem and there are clear requirements set both ways.

RIX-RTGS

The Riksbank allows Euroclear Sweden to administer a subset of central bank accounts for securities settlement. This constitutes a specific interdependency for the two systems. To manage that, the Riksbank and Euroclear Sweden have developed special reserve routines and meet on a regular basis to evaluate the arrangement and the risks involved. Information as to the risks which the use of RIX poses to systems settling payments in RIX is gathered in discussions with these participants, in particular in conjunction with any changes to their use of the system and in the work of FSPOS.

³⁰ See <http://www.fspos.se>.

The Riksbank regularly works to identify its own operational risks and to identify crisis scenarios in which it must be able to provide services. In this work, some crisis scenarios have been identified in which the RIX system will not be able to provide services. These scenarios are basically focused on operational crises of a broad nature that would affect the region and the Swedish financial markets in general. This includes operational risks that the participants in RIX-RTGS incur in their own environments and in infrastructures or service providers that they use. To work towards managing such situations and to minimise their impact, the Riksbank cooperates with actors in the Swedish financial market in FSPOS to establish routines to mitigate risks and the effect that such crises would have on the financial sector services. The Riksbank also regularly tests these routines together with other FSPOS members.³¹ In addition to the FSPOS tests, the Riksbank performs contingency tests twice a year with RIX participants. Because the work on extreme contingency situations is carried out in cooperation with a wide spectrum of market actors, the solutions reached take interdependencies into account. Indeed, the focus of many of the studies and recommendations in the forum are market interdependencies.

In addition to contingency facilities, the Riksbank has manual contingency routines (see Principle 17). These routines are sufficient to ensure that critical payments in RIX RTGS can be made even if no IT-systems or communications networks are available. The operating procedures for these routines include special attention to payments associated with the systems which depend on payments in RIX RTGS for their business. The same is valid for liquidity transfers between RIX RTGS and RIX INST. The Riksbank regularly tests all reserve sites, back-up messaging services and manual routines in the extent possible to both RIX RTGS and RIX INST to minimise the risk of contagion.

RIX-INST

For RIX-INST a shared technical platform is used, the TARGET Instant Payment Settlement (TIPS) platform, provided and operated by the Eurosystem³². That means that the Riksbank relies on the risk policies and operational procedures applicable to the platform. The decisions regarding the TIPS platform is ultimately made by the Governing Council of the ECB. The Riksbank is not represented in the Governing Council. However the Riksbank is represented in the level below the Governing Council that is responsible for the day to day operations, the Market Infrastructure Board (MIB) of the ECB. There are also other fora where non-euro central banks can discuss matters regarding the TIPS platform with the Eurosystem.

The Riksbank has entered into an agreement with the Eurosystem on the use of the TIPS services. In this agreement is outlined *inter alia* risk management issues. The Riksbank is of the opinion that the risk management applicable to the TIPS platform is in line with that applicable for RIX as set out above.

³¹ See <http://www.fspos.se>.

³² The Eurosystem consists of the European Central bank (ECB) and the national central banks in the countries that have adopted the Euro as their currency.

For the service RIX INST, technical problems related to the TIPS platform and other Eurosystem platforms are the most critical risk, especially since there are no contingency routines for the TIPS platform and disruptions may have a direct effect on the public. Although the TIPS platform is built as a very resilient system with a low probability of major technical disruptions the consequences of technical issues on the TIPS platform could result in downtime for the RIX-INST service.

RIX-INST will settle instant payments coming from a payment service that is critical for the participants' customers. The operator of this service as well as the party chosen by the Swedish market to be the single interface to RIX-INST and their providers are critical to the effectiveness of the settlement service.

The market independencies has increased with the service RIX INST as the public may be affected instantly even with shorter disruptions when they are related to RIX INST.

Financial and credit risk

The Executive Board has established an overall Financial risk and investment policy for the Riksbank.³³ In accordance with this policy, all financial risks shall be identified and measured. The Head of the Payments Department has the responsibility for managing risks associated with RIX according to the overall financial risk policy but also the internal governance and control policy of RIX³⁴ and for reporting these risks to the Head of the Risk Division and Executive Board of the Riksbank. In addition, the Risk Division undertakes an independent review of the Riksbank's risks.

The Riksbank's system for business planning allows for a global view of the Riksbank's operational risks under the supervision of the Riksbank's Controller. In addition, there is a legal risk deriving from the risk that the rules or contracts underlying the RIX system are not robust. This risk is highlighted concerning the addition of RIX-INST as a service. To manage the legal risk, the Riksbank has legal experts who draft and review all legal documentation and require legal opinions on issues where a conflict of law may arise. The Riksbank reviews its Terms and Conditions regularly.

RIX-RTGS

As the Riksbank grants intraday credit, this could lead to significant credit risks; however, the Riksbank mitigates this risk by requiring high-quality collateral for all intraday credit. Should the Riksbank need to liquidate collateral in a turbulent market and should these assets be sold at a significantly reduced price, there is a liquidity risk. As the Riksbank only grants intraday credit in Swedish kronor, the Riksbank would never lack liquidity in Swedish kronor. The monitoring and management of financial risks is supported by the Riksbank's collateral management system which automatically value and revalue the collateral pledged to the Riksbank on a daily basis, ensures that new

³³ Riksbank, Finansiell Risk- och investeringspolicy <https://www.riksbank.se/en-gb/about-the-riksbank/policy-documents/>

³⁴ Policy för styrning och uppföljning av RIX, in Swedish, <https://www.riksbank.se/sv/om-riksbanken/styrdo-kument/policy-for-styrning-och-uppfoljning-av-rix/>

credits are only granted after sufficient collateral has been pledged and monitors that collateral value continues to cover outstanding credits (see Principle 5).

The collateral management system provides data for the Riksbank to view aggregated exposures in relation to participants in its credit facilities and to view and analyse the stock of collateral pledged to the Riksbank.

RIX-INST

The Riksbank provides no credit in RIX-INST.

Management of risk

To manage the risks which have been identified, the Riksbank is governed by law as well as its own policies and rules. The Sveriges Riksbank Act strictly limits the financial risk which the Riksbank may take in providing intraday credits.³⁵ The Management Group and the Executive Board of the Riksbank receive reports every four months which provide a comprehensive view of the operational and financial risks at the Riksbank. In this context, the risks associated with the payment system are treated commensurate with their relative weight in the Riksbank's overall risk burden. The Riksbank regularly benchmarks its risk management policies and procedures against those used by other central banks. It monitors developments in risk management and reviews its own activities in light of these developments. The Riksbank benchmarks its IT security against ISO/IEC 27000.

The Head of the Payments Department decides on the cross-departmental regulatory framework for governance and follow-up on the assessments of risks for RIX. The management team of RIX does not have its own decision mandate.

The Risk Division at the Riksbank reviews the Financial risk and investment policy and the policy for internal control at least once a year or whenever circumstances require. The Risk Division is mandated and prepared to suggest changes to the policies if market conditions or risk intensity should warrant it. Such changes can be decided upon and implemented at short notice if necessary. Main policies are decided by the Executive Board of the Riksbank. The rules by which these policies are implemented are mainly decided by either the Executive Board, the Chief Risk Officer or the responsible Department Head.

Problems with the liquidity transfers from RIX RTGS to the RIX INST service can pose a liquidity risk in RIX-INST as well as problem with the liquidity transfers from RIX-INST to RIX-RTGS might pose a risk in RIX-RTGS. In the latter case there is however intraday credit available in RIX-RTGS. Hence there are manual contingency procedures for liquidity transfers. Moreover, if participants are unable to act efficiently in the system due to their own operational problems, they can disturb payment flows for other participants, both in RIX RTGS as well as in RIX INST. The Riksbank has analysed whether

³⁵ <https://www.riksbaand> investment nk.se/en-gb/about-the-riksbank/policy-documents/the-sveriges-riksbank-act/, Chapter 6 §7 "Credit may only be granted against adequate collateral."

these potential sources of risk are relevant for RIX and where relevant either takes action or works with participants to mitigate the risk.

RIX-RTGS

RIX-RTGS is designed to mitigate the risks which participants pose to each other in using the system. Nonetheless, certain sources of risk derive from participants' actions rather than the design of the system. Even in an RTGS environment, participants can disturb payment flows if they provide too little liquidity to the system, for example. Another source of risk which can arise even in an RTGS environment is that participants can increase operational risks by concentrating their payments to specific times of day (particularly late in the day). To help participants provide enough liquidity, the Riksbank grants intraday credits against collateral in RIX RTGS. The Riksbank works with RIX participants to encourage efficient use of the system but does not use financial incentives to this end. However, effort is made to provide efficient cooperative forums in which participants work together on issues related to use of the system. One instance of this is the information provided by and work done with participants to alleviate the concentration of payments occurring between 9:30 and 11 am. There are incentives for participants to minimise the effects which their operational disturbances have on RIX as this is a requirement in The Terms and Conditions³⁶. As a result, participants with repeated technical disruptions can be expelled from the system. Participants are also required to provide a written explanation to the Riksbank for any incidents they cause in the system.

To help participants evaluate their risks in using RIX, the system allows a participant access to information about its accounts, credits and collateral in real time. Participants are informed about the overall functioning of the system and settlement flows at regular meetings of the RIX User Group. The Riksbank's policy is to provide RIX participants with information about payment flows and about operational problems among participants. The Riksbank discusses participants' needs in conjunction with RIX User Group Meetings and observes the policies and services of other central banks in order to ensure that its policies and systems support participants in managing and containing their risk.

RIX-INST

The RIX INST service is dependent upon the TIPS platform and any technical issues with the TIPS platform will have a direct impact on the RIX INST service. There are manual routines for the liquidity transfers between RIX RTGS and RIX INST but there are no contingency routines for the event of technical issues with the TIPS platform.

Orderly wind-down

The issue of orderly wind-down plans does not apply to central banks, however the demand for safe large value payments could become so low that RIX can no longer meet its costs on a full recovery basis. In such a case, the Riksbank would review its

³⁶ <http://www.riksbank.se/en/Financial-stability/The-RIX-payment-system/Conditions-and-instructions/>.
<https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/conditions-and-instructions/>

activities in the payments area and if the Riksbank chose to close down the payment system, it would do so in an orderly and transparent manner.

RIX-RTGS

According to the new Riksbank Act, that will come into force on January 1, 2023, the Riksbank shall provide a payment system.³⁷ Hence, wind-down might not be an option.

³⁷ Chapter 3, Article 2, [SFS2022-1568.pdf \(svenskforfattningssamling.se\)](#) (in Swedish)

4.4 Principle 4: Credit risk

An FMI should effectively measure, monitor, and manage its credit exposure to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two largest aggregate credit exposures to the CCP in extreme but plausible market conditions. All other CCPs should maintain, at a minimum, total financial resources sufficient to cover the default of the one participant and its affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions.

Key conclusions

The designated settlement system RIX consists of two services, RIX-RTGS and RIX-INST, RIX participants are not subject to credit risk as part of the settlement process in neither of the services. The Riksbank does, however, have credit risk as it takes on exposures in relation to participants as a result of intraday credits but mitigates this with collateral. The Riksbank has systems and routines in place to ensure that credit exposures are always covered by adequate collateral. The Terms and Conditions for RIX state that the Riksbank will bear any losses resulting from its intraday credits.

RIX

The settlement in RIX-RTGS is made in real time on a gross basis and the settlement in RIX-INST is done instantly on a transaction by transaction basis. This means that neither the participants nor the Riksbank are exposed to credit risk in the settlement process.

RIX-RTGS

RIX-RTGS is an RTGS-system based on real-time, gross settlement in central bank money, where eligible participants in the system can pledge collateral to the Riksbank to obtain intraday and overnight credit.

In RIX-RTGS the Riksbank has exposures in relation to participants as a result of its intraday lending. The Riksbank provides intraday credit to participants in RIX-RTGS and it allows Euroclear Sweden to grant credit on the Riksbank's behalf to participants settling the payment leg of securities transactions. To mitigate the risks arising from intraday credits, the Riksbank has developed a risk management framework in which the use of collateral to mitigate credit risks is the main component.

This framework is implemented in the same way for the RIX-RTGS and for the subset of accounts for securities settlement. All lending is collateralised (see Principle 5). The

Riksbank has established specific requirements for assets to be accepted as eligible collateral. These requirements are central to the management of credit risks. Monetary policy counterparties to the Riksbank can roll over their intraday credits to monetary policy overnight.

The Sveriges Riksbank Act limits the risk which the Riksbank may take in providing intraday credit. Within the Riksbank, there is a committee that meets regularly to discuss the rules for collateral for credit pursuant to the Terms and Conditions. This committee establishes routines for accepting and removing securities from the list of eligible securities.

To identify its credit risks, the Riksbank analyses the payment processes, its granting of intraday credits and its policies and routines associated with taking collateral. To mitigate risks from intraday credit facilities, the Riksbank applies the principle that adequate collateral has to be pledged for all such exposures.

The Riksbank has real-time information about the size of outstanding credits and the collateral which has been pledged. The Riksbank values pledged collateral daily and monitors lending against that collateral continuously. It has systems in place to ensure that credits do not exceed the value of the pledged collateral. The policy of full collateralisation of credit exposures is designed to mitigate credit risks. As described above, the Riksbank's systems provide information about credits and collateral and monitor that lending does not exceed the value of pledged collateral for any participant (see Principle 5). The Riksbank takes a conservative haircut in valuing the securities used as collateral in order to cover future exposures arising from changes in collateral value during the time it is expected to take to liquidate the collateral. These haircuts are validated by the Risk Division at least once a year to make sure they are still adequate.

All securities used as collateral are held where the Riksbank is a direct member in the relevant CSD, and if needed there is an eligible link between the issuer CSD and the CSD where the Riksbank is a direct member exists. For cash, the Riksbank only uses central banks as correspondents. The managing process for collateral consists of either fully automated or efficient manual procedures. For further details on collateral, see Principle 5.

The Riksbank is fully responsible for any losses that arise from its granting credit to RIX-RTGS participants. Thus, there are no rules relating to the allocation of losses.

RIX-INST

In RIX-INST it is not possible to use intra-day credit. The intraday credit can only be utilised in RIX-RTGS, meaning only RIX-RTGS participants can use the intraday credit. Hence, neither the RIX-INST participants nor the Riksbank takes any credit risk in RIX-INST.

4.5 Principle 5: Collateral

An FMI that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.

Key conclusions

To limit credit risk, the Riksbank, in accordance with the Sveriges Riksbank Act, applies the principle that adequate collateral shall be pledged for all such exposures. The Riksbank's policy regarding which assets it will accept as collateral aims to meet the requirement in the Sveriges Riksbank Act, while simultaneously supporting the Riksbank's monetary policy and financial stability objectives. The collateral policy establishes eligibility criteria designed to mitigate credit, liquidity, market and wrong way risk associated with collateral. The rules for valuing assets as collateral including the haircuts taken are conservative and intended to cover stressed market conditions, which is validated by the Risk Division yearly. The haircuts, eligibility criteria and concentration limits all support the Riksbank's ability to liquidate its collateral even in times of market disruption. The Riksbank's collateral management system automatically manages activities associated with accepting, releasing and valuing collateral.

Background

It is only possible to use collateral for intraday credit in RIX-RTGS. Hence, the following description of the collateral policy's and processes described below only applies for RIX-RTGS participants.

The Riksbank has considered credit, liquidity and market risks to design a collateral policy which meets the requirement for adequate collateral stated in the Sveriges Riksbank Act³⁸ and supports the Riksbank's monetary policy and financial stability objectives. The Riksbank's collateral policy defines the types of assets which the Riksbank will accept as collateral. In broad terms, the Riksbank accepts debt securities issued by a government, central bank, local government or other public body or credit-worthy company. Moreover, the Riksbank must approve both the country in which the issuer is domiciled and the currency in which the securities are issued. Normally, an acceptable credit rating is used to demonstrate creditworthiness.³⁹ Securities issued by credit institutions, specifically those issued by the counterparty itself and Asset-Backed Securities are not accepted as collateral. All requirements in the collateral

³⁸The Sveriges Riksbank Act (1988:1385) om Sveriges Riksbank -, Chapter 6 §7 "Credit may only be granted against adequate collateral", <https://www.riksbank.se/en-gb/about-the-riksbank/policy-documents/the-sveriges-riksbank-act/>.

³⁹ As an indication of creditworthiness, the Riksbank has set minimum credit rating requirements: Standard & Poor's, LT:AA-, Moody's, LT: Aa3, Fitch IBCA, LT:AA- See Terms and Conditions Annex H4 Collateral Instructions, <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/collateral/>

policy are presented in the Terms and Conditions and in particular in the Collateral Instructions, Appendix H4.⁴⁰ In connection with the operation of RIX, there are no situations in which the Riksbank makes exceptions to its collateral policy.

Collateral policy

As a result of its collateral management system, the Riksbank has an automated process for approval of certain Swedish securities that meet all requirements for eligibility. However, even this process requires a final manual eligibility check and approval of the security. For other securities, RIX participants have to formally send an application for each security they wish the Riksbank to approve. The approval process includes checks to see that each eligibility criterion has been met. Securities that are approved appear on a list of eligible assets on the Riksbank website.⁴¹ The Riksbank regularly monitors that the securities on the list continue to meet all eligibility criteria via largely automated processes. The Riksbank's collateral management system also checks that each security which a participant pledges to the Riksbank is on the list of eligible assets before accepting the pledge.

All collateral is marked to market daily via automated processes. The Riksbank uses the most recent closing price from the previous valuation day. If there are no reliable market prices available, a theoretical price is calculated that is based on the present value of the expected future cash flow for a given security and the yield-to-maturity derived from the relevant swap curves. The Riksbank may exercise discretion if it finds that the risk properties of a security are not adequately reflected in the valuation. The Terms and Conditions state that "The Riksbank can decide on further valuation haircuts if necessary in view of the securities' risk properties."⁴²

The Terms and Conditions establish a framework for how haircuts are applied. Eligible securities are classified according to a liquidity category (1-3), where the type of issuer and the type of security are taken into account. For each liquidity category, different haircuts are applied depending on duration and coupon structure of the securities. Furthermore, there is an extra haircut for securities denominated in a currency different from that of the credit. Haircuts are established to cover expected price fluctuations during the period which the Riksbank expects to need to liquidate the security. The Riksbank has based its haircuts on a period with very high volatility. The haircuts are reviewed at least yearly by the Risk Division and can also be reviewed if market volatility should increase. To reduce the need for procyclical adjustments, the Riksbank aims to have a framework for haircuts that is conservative enough to cover stressed market scenarios.

The Riksbank's collateral policy establishes concentration limits per counterparty for those securities in respect to which the Riksbank has deemed that concentrated holding might impair its ability to liquidate collateral in some market conditions. According

⁴⁰ For a detailed description of the collateral policy see Terms and Conditions Annex H4 Collateral Instructions, <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/collateral/>

⁴¹ <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/collateral/eligible-assets/>.

⁴² Terms and Conditions for RIX and monetary policy instruments, Chapter E 1.2.2(b) and 2.2.2, <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/conditions-and-instructions/>

to these rules, a maximum of 60 per cent of a counterparty's collateral may be made up of covered bonds. Covered or guaranteed bonds issued by credit institutions must have a credit rating of AA-. In addition, covered or guaranteed bonds from the same issuer group may make up a maximum of 50 per cent of the counterparty's value. In order to mitigate wrong-way risk securities issued by the counterparty itself or a company closely linked to the counterparty are not eligible. For the same reason securities issued by credit institutions and not covered by collateral or public guarantees are not eligible. The Riksbank also does not accept small issuances.

The risk that securities will be difficult to liquidate and the possible effects of the Riksbank attempting to liquidate its collateral are important considerations in setting the Riksbank's collateral policies. The Riksbank reviews the collateral policies as needed.

The Riksbank accepts two sorts of cross-border collateral, cash and securities. For cash in DKK and NOK, the Riksbank has developed an automatic arrangement together with the Danish and Norwegian central banks in the form of accounts in the central bank, as collateral for intraday credit in one of the other central banks. Furthermore, the Riksbank accepts EUR that is paid into the Riksbank's account with the Deutsche Bundesbank. For cross-border securities, the Riksbank accepts securities denominated in the following currencies: USD, GBP, DKK, EUR, JPY, NOK and SEK if issued in an eligible country.

Mitigating risk

In addition to the risks which the Riksbank faces in accepting domestic collateral, the Riksbank also encounters legal, operational, custody, counterparty (for cash), market and FX risks in accepting foreign collateral.

To mitigate legal risks, the Riksbank restricts the countries where securities can be held and issued. To mitigate both custody and legal risks, the Riksbank also restricts the ways in which securities can be held, i.e. where the Riksbank is a direct member in the relevant CSD and if needed there is an eligible link between the issuer CSD and the CSD where the Riksbank is a direct member. In the case of cash, the Riksbank only uses central banks as correspondents to mitigate counterparty risks from cash deposits. To mitigate market risks, the Riksbank classifies the eligible securities in different liquidity categories depending on the type of issuer and type of security. The category, the maturity and the coupon structure determine which haircut is to be applied. To mitigate the foreign exchange risks, the Riksbank adds an additional haircut for securities denominated in a foreign currency. To mitigate operational risks, the Riksbank has automated most operations relating to cross-border collateral management.

The procedures for accepting cash as collateral are fully automated and can be completed in minutes. The procedures for managing foreign securities as collateral within the Riksbank are efficient and fully automated. The Riksbank cannot control all steps in mobilising foreign collateral through CSD links. However, the Riksbank does analyse the legal certainty and to some extent the operational reliability of CSD links before

they become eligible for use. It may take some time for participants to pledge or retrieve cross-border securities; however, the fact that participants can pledge cash quickly mitigates any difficulties in accessing collateral in a timely manner.

Collateral management system

The collateral management system is to a large extent automatic and is fully integrated with RIX-RTGS.⁴³ For collateral transactions, the Riksbank matches every movement in the account which prevents the reuse of collateral.

The collateral management system manages all requests from participants to add collateral, remove collateral or substitute collateral from accounts in Euroclear Sweden automatically. Collateral cannot be released unless the collateral management system allows it. The system checks with RIX-RTGS to make certain that collateral values would not fall below the value of outstanding credits before it allows the collateral to be released.⁴⁴ The collateral management system allows for real-time changes in the list of eligible collateral, in the list of counterparties and small modifications in parameters. More significant changes are made when necessary.

The collateral management system is highly automated, which enables the Riksbank to handle the operational work even during stressed market conditions. In addition, the system is monitored by IT-technicians and by operational personnel during its hours of operation. Furthermore, reserve routines have been developed to mitigate the effects of disturbances in the system.

⁴³ Euroclear Sweden, administers on behalf of the Riksbank central bank accounts for the purpose of securities settlement. Euroclear Sweden also administers the granting of intraday credits associated with these accounts. In connection with this, Euroclear Sweden administers the taking of collateral according to the Riksbank's rules. This is a small part of the Riksbank's intraday credit and the procedures for this are not described here.

⁴⁴ For a description of the processes associated with adding, substituting and releasing collateral see Terms and Conditions, Annex H4 Collateral Instructions, <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/collateral/>.

4.6 Principle 7: Liquidity risk

An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.

Key conclusions

The Riksbank is faced with liquidity risk when accepting collateral. However, as the central bank of issue, the Riksbank will never lack liquid resources as a result of operating the designated settlement system RIX, including the two settlement services RIX-RTGS and RIX-INST.

RIX

The Riksbank takes collateral to cover its credit exposures. That gives rise to liquidity risk. Should the Riksbank need to liquidate the collateral in illiquid markets, it may have difficulty or may obtain a lower price than expected. This could result in a credit loss for the Riksbank. Principle 4 on credit risk and Principle 5 on collateral describe the framework for managing credit risks. However, as the central bank of issue, any such loss would never affect the Riksbank's ability to meet its obligations in Swedish kronor. In as much as the Riksbank can never lack liquidity in Swedish kronor, RIX participants face no liquidity risk from the Riksbank. Lack of liquidity may arise for participants if their counterparties do not make payments as expected. This risk is mitigated by the participants having access to intraday credit.

4.7 Principle 8: Settlement finality

An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.

Key conclusions

The RIX system has been designated and notified to European Securities and Markets Authority, ESMA, as a system within the scope of the Settlement Finality Directive (1998/26/EC) in accordance with the Act concerning Systems for the Settlement of Obligations on the Financial Market (SFS 1999:1309), which transposes the Settlement Finality Directive into Swedish law. An administrator of a settlement system shall according to the aforesaid Act establish satisfactory joint rules and standardised arrangements to execute transfer orders as well as rules which state that Swedish law is applicable. The RIX system provides final settlement in real time throughout the day. The Terms and Conditions provides the clarifications required by the Act concerning Systems for the Settlement of Obligations on the Financial Market with respect to inter alia irrevocability. These rules are harmonised with the rules for the securities settlement system which settles the payment leg of DVP securities transactions in central bank accounts. However, the Terms and Conditions should be clearer with respect to finality.

RIX

As described above and in Principle 1, the Settlement Systems Act transposes the Settlement Finality Directive (98/26/EC) into Swedish law⁴⁵. The Act stipulates that a payment order in relation to a third party shall be honoured even if insolvency proceedings have been initiated against a participant in a designated settlement system, provided the payment order was entered (Sw. införd) into the system prior to notification of the court's decision to initiate insolvency proceedings. The Act also prohibits revocation of a payment order by a participant in a notified settlement system or by a third party after the time stipulated in the regulations that apply to the system.

All participants shall have valid legal status and the capacity to assume with binding effect the rights and obligations of the Terms and Conditions. Foreign participants have to provide a legal opinion to evidence that the Terms and Conditions for RIX are legal, valid and binding on them in their jurisdiction.⁴⁶

⁴⁵ A change in the Bankruptcy Act that came to force in March 2015 takes care of the former uncertainty in Swedish law as to the finality of Funds Settlement Instructions and collateral transactions completed after but within the same day as a court decision about the insolvency of a participant. The amendment ensures that an official receiver cannot require that a transfer order, such as a securities transaction or payment, entered into a system by a Swedish participant after a bankruptcy is withdrawn. However, this amendment does not cover the question of what will apply in Swedish law to overseas participants. This remaining legal uncertainty is however handled by requiring that foreign participants in RIX have to provide a legal opinion to Riksbanken to prove that the settlement finality is binding in their jurisdiction.

⁴⁶ Terms and Conditions for RIX and Monetary Policy Instruments, B 4.2.2. (b) / <https://www.riksbank.se/en-gb/payments--cash/the-payment-system--rix/conditions-and-instructions/>

RIX-RTGS

The Terms and Conditions clearly identify the moment when a payment has been entered into the system as A payment is deemed entered into RIX-RTGS at the moment when the payment has been validated according to the second step of the automatic transfer process⁴⁷ in which the Payment Instruction is validated, meaning the payment complies with the format requirements and the applicable specifications set in the system.

Irrevocability and finality are defined as the moment when “the recipient RIX-RTGS participant’s account has been credited in accordance with the payment.”⁴⁸ As the point of settlement finality is defined in the Terms and Conditions, it is public information.

The rules for irrevocability are defined as the moment when “the recipient RIX-RTGS participant’s account has been credited in accordance with the payment.”⁴⁹ RIX-RTGS participants entering the payment may revoke it up until the time when it has been settled. However, instructions may never be revoked after settlement and there are no exceptions to this. The rules regarding irrevocability are clearly stated in the Terms and Conditions which are publicly available.

RIX-RTGS provides settlement in real time as soon as liquidity is available. As a result, final settlement is not delayed. Participants are notified immediately upon final settlement through both the RIX-RTGS Online application and SWIFT. All procedures and contingency routines are designed to complete settlement on the intended value date. RIX-RTGS has never deferred payment to the next settlement day.

RIX-INST

The Riksbank settles payments in accordance with the payment instructions submitted by a RIX-INST participant or by the participant’s instructing party. Settlement takes place only if all technical checks have been made with a positive result and that funds are available (to be debited immediately or to be reserved and later debited on the originating participant’s account or sub-account (in RIX-INST named Credit Memorandum Balance, CMB).

In RIX-INST a payment instruction is entered into RIX-INST when the payment instruction has been validated according to the second step of the automated settlement procedure.

There are two settlement models in RIX-INST, the Standard Settlement model and the Single Instructing Party (SIP) model. The payment is settled immediately after the

⁴⁷ Terms and Conditions for RIX and Monetary Policy Instruments, C 1.5.5 e (i)-/. <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/conditions-and-instructions/>

⁴⁸ Terms and Conditions for RIX and Monetary Policy Instruments, C 1.5.5 b -/ <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/conditions-and-instructions/>

⁴⁹ Terms and Conditions for RIX and Monetary Policy Instruments, C 1.5.5 b <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/conditions-and-instructions/>

transaction has been accepted by the beneficiary or its instructing party if the Standard Settlement model is used or immediately after an approved validation by RIX-INST if the Single Instructing Party Settlement Model (SIP Model) is used.

A settled payment in RIX-INST can never be recalled.

4.8 Principle 9: Money settlements

An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.

Key conclusions

All settlement in RIX is conducted in central bank money.

RIX

All settlement in RIX, regardless of settlement service, is conducted in Swedish kronor and in central bank money to minimise the risk in using the systems. Settlement of a payment or a transfer of liquidity is settled by debiting one account in the Riksbank and simultaneously crediting another account in the Riksbank. In this way, the settlement asset is always and exclusively a claim upon the Riksbank.⁵⁰

⁵⁰. <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/> for a description of settlement in RIX

4.9 Principle 12: Exchange-of-value settlement systems

If an FMI settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.

Key conclusions

The RIX system does not settle two linked obligations.

RIX

Neither RIX-RTGS nor RIX-INST settlement service settles two linked obligations.

4.10 Principle 13: Participant-default rules and procedures

An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.

Key conclusions

If a participant in RIX at any point in time fails to pay any payment to the Riksbank or if the participant is declared bankrupt by a court of law, the participant is considered to be in default. A situation in which a participant enters into bankruptcy would be managed according to the procedures for exclusion of a participant and is assessed in accordance with Principle 18. The Riksbank bears responsibility for any losses that might arise and has contingency procedures to manage the situation.

RIX

The RIX Settlement System consists of two settlement services, RIX-RTGS and RIX-INST. A RIX participant can choose to be certified for one or both of the services. If a participant at any point in time fails to pay any payment to the Riksbank or if the participant is declared bankrupt by a court of law, the participant is considered to be in default. According to the Terms and Conditions⁵¹, the Riksbank can suspend or exclude a participant in default. The suspension or exclusion can be partial or total. All transactions that are processed before a default are covered by the Act concerning Systems for the Settlement of Obligations on the Financial Market (SFS 1999:1309). The Riksbank will not cancel any transaction already processed in the system. The Terms and Conditions⁵² are publicly disclosed. The Riksbank has internal documents that describe how a default should be handled and where the responsibility lies internally within the Riksbank. The Riksbank has routines in place for communication with all the relevant stakeholders. The contingency plans are reviewed when necessary.

RIX-RTGS

When certified for RIX-RTGS, and, by pledging collateral, a participant can gain access to credit. A participant that fails to repay its intraday credit will be charged at a penalty rate for the outstanding credit overnight. If this occurs more than four times over a 12-month period, the participant can be suspended from intraday credit. If a participant at any point in time fails to pay any payment to the Riksbank or if the participant is declared bankrupt by a court of law, the participant is considered to be in default. The Riksbank has conservative haircuts to cover its exposures even in stressed market conditions. This means that if a participant were to default, the Riksbank should have enough collateral to cover the exposures. In the very unlikely event that a credit loss occurs, the Riksbank is the central bank of issue and can always provide liquidity in

⁵¹ <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/conditions-and-instructions/>

⁵² <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/conditions-and-instructions/>

SEK in order to cover a credit loss. For more information on collateral, please refer to Principle 5.

4.11 Principle 15: General business risk

An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.

Key conclusions

To identify and manage business risk, the Riksbank considers changes in the Swedish payment markets and controls its own costs. To understand market needs, the Riksbank gathers information on major changes in RIX participants' business and market practices, surveys participants and provides forums to discuss RIX operations and procedures. The pricing of RIX services is built on the principle of full cost recovery. Full cost recovery means that the Riksbank will always set prices to cover its costs. To avoid unexpected price shocks as a result of unexpected decreases in revenues or increases in costs, the pricing model is designed to smooth out variations. Furthermore, the Riksbank provides participants with information about the pricing model, revenues and costs so that they are aware of factors affecting costs and prices.

Background

The Riksbank's overriding objective with the RIX system is to promote a safe and efficient payment system. To meet this objective, the Riksbank works to provide the payment services which RIX participants need and to meet their requirements for quality and security. RIX is operated on a full cost recovery basis. Managing business risk focuses on understanding market developments and the needs of RIX participants while controlling costs.

Market development

The Riksbank monitors changes in the payment market which may affect either volumes of payment flows in RIX or participants' requirements. The Riksbank is represented in different forums which spread information about payment-related developments in the Swedish market including its own forums, the RIX User Group and the RIX Council⁵³. The Riksbank also engages in bilateral dialogues with participants to understand their needs, and also closely follows the international developments. The Riksbank gains further information about participants' use of RIX and their needs in

⁵³ The RIX User Group is a collaborative group where all participants are represented. RIX User Group prepares and presents proposals for further development of RIX. The RIX Council is a group that discusses strategic issues related to the provision of systems and payment services, such as goals and conditions, costs, fees and pricing, crisis and continuity issues, regulatory issues, project issues, and IT services. Riksbank appoints the chairman of the group. The RIX Council includes representatives from the Riksbank and representatives of RIX participants.

conjunction with its biennial evaluations of participants' continued fulfilment of requirements for RIX participation.

FMI active on the Swedish market process and clear payments before they are sent to the RIX system. Changes in their behaviour can affect transactions in RIX. Therefore, the Riksbank collects information about participants' use of RIX through the RIX User Group and the RIX Council. In addition, the Payment System Division is involved in FSPOS and this is also a source of information about market developments and market needs.⁵⁴

RIX-INST

Due to the fact that RIX-INST uses a platform that is used by a large number of international communities, the Riksbank is also represented in the TIPS Consultative Group along other central banks and community representatives. The purpose of the group is to discuss the evolution of the TIPS platform. The Riksbank is also represented in a forum for central banks using the TIPS platform or other TARGET Services.

Cost recovery and price structure

The Riksbank monitors its costs every four months and provides information internally in connection with the publication of the RIX four-month period report and annually external in connection with the publication of the annual report.⁵⁵ The Riksbank has a policy of full cost recovery for RIX services as stipulated in the document "Principles for pricing the supply of RIX services, etc.". This means that participants must cover all of the Riksbank's costs for supplying the RIX system. Thus, all internal and external resources used are included in the cost base.⁵⁶ The costs are allocated to either RIX-RTGS or RIX-INST. Prices are then set to cover these costs.

Since the Riksbank prices its RIX services to ensure full cost recovery, significant decreases in revenue or significant increases in costs will affect the costs of participating in the system. For example, if one of the larger participants (with high volumes and domestic revenues of over SEK 1 billion) left RIX or if two or more participants merged, revenues would fall significantly. However, the pricing model is flexible enough to smooth out such a revenue loss with only minor adjustments in prices for the coming years.

The Riksbank also works to ensure that participants are well informed about costs, revenues, prices and the pricing model. In the RIX report which comes out every four months, the Riksbank publishes cost and revenues for the period so that participants can monitor these. The pricing of RIX is presented transparently to participants and

⁵⁴Finansiella Sektorns Privat-Offentliga Samverkansgrupp (FSPOS) a group made up of government agencies and financial market participants with the support of the Swedish Civil Contingency Agency. The group works to improve the resilience of the financial sector.(See Principle 3 Key Consideration 3 for more on this.)

⁵⁵ <https://www.riksbank.se/en-gb/press-and-published/publications/annual-report/>.

⁵⁶ This is specified in the budgeting work performed annually by the Payment System Division. Other considerations in the budgeting work for the next year are an estimate of the number of transfers for the next year based on historical data and potential new behaviours among participants, potential changes in number of participants, e.g. new participants or mergers of participants.

dialogue with and information dissemination to participants start at an early stage of the price-setting process. There is no need for the Riksbank to hold any specific assets to cover business losses, since the Riksbank is the central bank of issue.

RIX-RTGS

The Riksbank participates in RIX-RTGS to implement its monetary policy and foreign exchange policy transactions and to execute transactions within the scope of the Riksbank's correspondent bank activities on behalf of foreign central banks and international financial bodies. The Riksbank pays the same charges for using RIX as other participants.

The pricing model consists of five major parts, (i) a fee per payment order, (ii) a fixed monthly fee that is the same for all participants, (iii) a fixed monthly fee for all participants that have the possibility of exercising their right to credit in RIX-RTGS through a grant pledge (iv) an additional fee that is divided among the RIX-RTGS participants with domestic revenues of over SEK 1 billion according to the Swedish Bankers' Association's compilation, and (v) an entry fee for new RIX participants.

The principle of full cost recovery is implemented for RIX-RTGS over a period of three years, so that temporary cost fluctuations can be smoothed out.

RIX-INST

In the cost base for RIX-INST is included the costs that the Riksbank pays to the Eurosystem for the use of the TIPS platform.

The pricing model for RIX-INST is similar to that of RIX-RTGS but consists only of three major parts, (i) a fee per payment order, (ii) a fixed monthly fee that is the same for all participants, (iii) an additional fee that is divided among the RIX-INST participants with domestic revenues of over SEK 1 billion according to the Swedish Bankers' Association's compilation, and (iv) an entry fee for new RIX-INST participants (not being a RIX-RTGS participant). The fee per payment order equals the fee that the Riksbank pays to the Eurosystem for each payment order sent to the TIPS platform.

The principle of full cost recovery is implemented for RIX-INST over a period of seven years, so that temporary cost fluctuations can be smoothed out. The cost recovery period is longer for RIX-INST than RIX-RTGS since there is greater uncertainties regarding both costs and revenues since instant payments is a new service for the Riksbank.

Orderly wind-down

The issue of orderly wind-down plans does not apply to central banks.

RIX-RTGS

Nevertheless, the demand for safe large value payments could become so low that the RIX system would no longer be able to meet its costs on a full recovery basis. In such a case, the Riksbank would review its activities in the payments area and if the

Riksbank chose to close down the payment system, it would do so in an orderly and transparent manner.

According to the new Riksbank Act, that comes into force on January 1, 2023, the Riksbank shall provide a payment system.⁵⁷ Hence, wind-down might not be an option.

⁵⁷ Chapter 3, Article 2, [SFS2022-1568.pdf \(svenskförfattningssamling.se\)](#) (in Swedish)

4.12 Principle 16: Custody and investment risk

An FMI should safeguard its own and its participants' assets and minimise the risk of loss and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.

Key conclusions

The Riksbank's collateral policy requires that collateral pledged to the Riksbank be held in secure arrangements that mitigate custody and investment risks. As part of its assessment of eligible custody arrangements, the Riksbank ensures that there is legal support for rights over collateral.

RIX

The Riksbank offers intraday credit only in RIX-RTGS. Hence, risks related to collateral is only applicable to RIX-RTGS.

The Riksbank does not invest any assets as part of the operation of the payment system. It does have investments in its management of the foreign exchange reserve and for monetary policy purposes; however, these are not within the scope of this assessment.

RIX-RTGS

In order for a security to be used as collateral, the Riksbank's collateral policy requires that the security must be held in a CSD, ICSD or custodian which the Riksbank deems to be secure. Furthermore, the Riksbank or the CSD or ICSD which it uses as a custodian must have an account relationship with that CSD or ICSD of issue or there must be an eligible link from a CSD (ICSD) where the Riksbank or its custodian has an account relationship to the CSD of issue. There is currently one CSD, Euroclear Sweden, and one ICSD, Euroclear Bank, for which the Riksbank has evaluated and established arrangements for RIX participants to pledge securities. In addition, a number of links have been assessed to be eligible⁵⁸. Furthermore, the Riksbank has established agent arrangements with the Danish and Norwegian central banks for the use of cash in their domestic currencies as collateral. The Riksbank also uses its account at Deutsche Bundesbank to enable RIX participants to pledge cash in euro⁵⁹.

Euroclear Sweden is regulated by the Swedish financial supervisory authority, Finansinspektionen, and Euroclear Bank by the Belgian authorities. In accordance with the Terms and Conditions, the Riksbank has evaluated both these depositories including their accounting practices, safekeeping procedures and internal controls, and

⁵⁸ <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/conditions-and-instructions/>

⁵⁹ <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/collateral/>

found that these arrangements are sufficiently secure and would not entail any restriction of the Riksbank's ability to use and liquidate pledged assets registered on book-entry accounts.

The assessment of a new custody arrangement or a new arrangement through which the Riksbank will accept collateral from a participant includes a legal investigation to assess the Riksbank's ability to use and liquidate any pledged assets under the relevant law. Furthermore, legal agreements between all parties (the Riksbank, the participant pledging the assets and the custodian) support the above arrangements. All collateral arrangements are constructed in such a way that they follow the opening hours of RIX or in some cases the operating hours of a central bank custodian. Currently, the Riksbank does not use custodian banks for the assets which it holds as collateral for credits in the payment system. In some circumstances, the Riksbank uses the services of other central banks and these are deemed secure.

RIX-INST

Custody risk is not applicable to RIX-INST.

4.13 Principle 17: Operational risk

An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.

Key conclusions

RIX provides a high level of confidentiality, integrity, authentication and auditability. The Riksbank's operational reliability objectives for the RTGS system are: a technical availability of 99.85 per cent; to the resumption of operations within two hours following a disruptive event; and complete settlement of payments by the end of the day of the disruption. These objectives for the RIX RTGS payment system were met in 2021. For the RIX-INST settlement service which uses a shared platform owned and operated by the Eurosystem, the operational objectives for that platform are: a technical availability of 99.9 per cent and the resumption of operations within 15 minutes following a disruptive event.

To maintain RIX's operational reliability, the Riksbank has implemented procedures for continuous monitoring, built-in warning systems and clear plans to cope with any system incidents for its RTGS system. As part of its business continuity work, the Riksbank organises regular tests of its contingency arrangements both internally and together with participants. For RIX-INST similar procedures has been implemented by the operator of the platform. However, the contingency arrangements in place for instant payments are limited and covers only liquidity transfers between RIX-RTGS and RIX-INST.

RIX-RTGS is synchronously mirrored at backup sites in different locations from the main site. The risk profile for the back-up sites are different to the main site. RIX operational risk policies and procedures are comprehensive and subject to regular review, including audits and external reviews, to ensure they remain effective over time. The Riksbank works systematically together with the Swedish financial sector to minimise the impact of a crisis. The platform used for RIX-INST is also available at sites in different locations from the main site. For RIX-INST the Riksbank relies on the operational risk policies set by the provider of the platform and the operational procedures used by the operator of that platform. The Riksbank is of the opinion that these policies and procedures are meeting the RIX requirements.

Governance

The Riksbank's operational risk framework consists of a policy for operational risk which establish the level of operational risk which can be accepted. As described in Principle 3, the Executive Board are responsible for establishing the operational risk

framework while the Head of the Payment Department is responsible for its implementation under the guidance of rules set by the Risk Division in the Corporate Services Department. According to the internal Policy for monitoring and control of RIX⁶⁰ which aim is to, in more detail clarify what applies to the internal governance of RIX, the risk of events that may affect availability, accuracy or confidentiality in RIX should be low and the resilience to events that affect this should be high. Identified risks must be evaluated, limited and addressed continuously and in a structured way.

The operational risk framework calls for a comprehensive risk assessment annually or in association with any changes. Essential changes have to follow a specific New Process Approval Process. The identification and mitigation of all material operational risks takes place every four months for RIX as a FMI. To identify these risks in the comprehensive risk assessment, the Riksbank carries out a Risk Control Self-Assessment (RCSA) to identify and determine the seriousness of sources of operational risk associated with operating RIX-RTGS as well as the service RIX-INST. The assessment draws on the technical, operational and risk management expertise within the Riksbank. The Head of the Payment Department reviews the RCSA. Based on the guidelines in the Riksbank's operational risk framework, the department head decides whether identified operational risks should be accepted, mitigated or avoided. At least every four months, any action plans associated with the risks are reviewed, any changes which might affect the operational risk level are reviewed. To manage the risks once they have been identified, the RIX system applies the Riksbank's framework for ORM, which is based on the ESCB ORM/BCM framework. The ORM/BCM framework is developed and maintained by the Risk Division.

As described in Principle 2, the Executive Board of the Riksbank is responsible for establishing the policy for internal control, the policy for operational risk and monitoring the management of operational risk. The policy for internal control and operational risk establishes that the risks to which the Riksbank is exposed should be mitigated as far as possible. The policy further specifies the three lines of defence in order to ensure that operational procedures are implemented appropriately and that policies and plans for managing operational risk are followed. The first line is the Head of the Payment Department who is responsible for managing these risks, monitors the risks and sees that policies are implemented correctly. The second line of defence is the Risk Division, which provides advice in implementing procedures and evaluates the first line. Finally the third line of defence is the focus of the internal and external auditors on risk management at the Riksbank. The Internal Audit Department audits a subset of routines, procedures and controls on a yearly basis (See Principle 2). The Swedish National Audit Office may audit any activities at the Riksbank. The Swedish National Audit Office is independent from the management of the Riksbank and by law has the right to determine the focus of its audits and to obtain all documentation and access necessary to perform them.

^{60 60} Policy för styrning och uppföljning av RIX, in Swedish, <https://www.riksbank.se/sv/om-riksbanken/styr-dokument/policy-for-styrning-och-uppfolning-av-rix/>

The Risk Division is tasked with an on-going examination and review of the operational risk management processes. The internal control policy as well as the operational risk policy is reviewed by the Executive Board when needed. The framework is then endorsed after any change (See Principle 3 for more details).

RIX-RTGS

The most significant operational risks identified for RIX are related to problems with the hardware, software and communications channels which make up RIX-RTGS and QCMS, the collateral management system, together with events affecting the skilled personnel running and operating the system. In addition, the Riksbank has identified any changes and intervention in the system, for example changes to software, testing of software or manual restart of the system, as being critical times for operational risk. As far as personnel are concerned, there is no single point of failure. However, as a small organisation, the Riksbank is vulnerable.

To manage risks associated with its hardware, the Riksbank has different sites subject to security and with redundancy of key hardware. To manage risks related to the software of the system, the Riksbank has stringent rules for testing all new software, and it monitors the functioning of the system. Should problems emerge, the Riksbank has routines and plans to mitigate their effect. The Riksbank is a small organisation and has a small number of staff that are trained to operate the RIX system. To mitigate the risk that some event such as an epidemic will affect the operation of RIX, the Riksbank has a policy of training all operational personnel to carry out all critical operational tasks.

The Riksbank recognises that retaining qualified staff and dependency on key personnel are important ways of managing its operational risks. The Riksbank works to develop the competence of its staff through training, to retain skilled staff through good personnel policy and to recruit good staff. The Payment System Division has routines and training programs to reduce its dependency on key individuals. Developing these routines and improving training has high priority. Individuals working with RIX must obtain security clearance. In combination with a high level of physical security and a high level of access controls in the systems, the aim is to protect RIX from both internal as well as external risks.

As mentioned above, the Riksbank recognises any changes in its systems as critical times for operational risk and therefore has clear policies for project management and change management. Particular risk management plans and controls are in place to protect the system in connection with a change. The IT and Digitalisation Department within the Riksbank has an ITIL⁶¹-based change management process and the bank also applies a project management framework to ensure quality in any major changes.

⁶¹ ITIL (IT Infrastructure Library) is a set of practices for IT that focuses on aligning IT services with business needs. ITIL describes processes, procedures, tasks and checklists that are not organisation-specific, used by an organisation for establishing integration with the organisation's strategy, delivering value and maintaining a minimum level of competency. ITIL is a register trademark of the United Kingdom Office of Government Commerce.

Each year, the Riksbank establishes a plan for testing the operational resilience of the Riksbank as a whole. In addition, there is a special plan for RIX. Staff members are trained on a regular basis, both in working from alternate sites and with manual routines. The RIX exercise plan includes an annual program of testing participants' ability to use alternative sites for RIX, alternative communication channels and manual routines (which includes liquidity transfers between RIX-RTGS and RIX-INST). RIX-RTGS participants test the Riksbank's alternative site once a year. Some of the exercises are held unannounced both for participants and for the Payment System Division.

RIX-INST

The operational risks that the RIX-INST settlement service is exposed to is not that different from those that apply to the RIX-RTGS service, i.e. hardware, software and communication channels. However, for RIX-INST the Riksbank relies on platforms provided and operated not by the Riksbank but by the Eurosystem. This means that the Riksbank relies on the operational risk framework established by the Eurosystem.

While the Riksbank is represented in the forum responsible for the day to day operations of the TARGET Services, the Market Infrastructure Board (MIB), the Riksbank is not represented in final decision-making body, the Governing Council of the European Central Bank. There are however additional fora established in order for a non-Euro central bank, as the Riksbank, and the Eurosystem to meet and try solve any disagreements.

The Riksbank is of the opinion that the operational risk policy for the services provided by the Eurosystem is meeting the requirements of the Riksbank's internal operational risk policy. The operational risk policy for the services provided by the Eurosystem is also part of the agreement between the Riksbank and the Eurosystem regarding the use of the TIPS Service, and hence accepted by the Riksbank.

Similarly there is also a well-established change and release management process for the services provided by the Eurosystem.

Technical capacity and evaluation

RIX-RTGS

The Riksbank's operational reliability objectives for the RTGS system are; a technical availability of 99.85 per cent; the resumption of information technology system operations within two hours following a disruptive event; and complete settlement of payments by the end of the day of the disruption. These objectives and a yearly evaluation of RIX are documented in the annual report and published on the Riksbank's webpage, www.riksbank.se.

RIX RTGS currently has the capacity to meet the needs of the Swedish market and this capacity can be scaled up if needed. The number of transactions processed increased with the introduction of the new payment system from about 8,000 per day in 2009 to about 25,600 per day in 2021. The hourly processing capacity in the system is estimated at about 45,000 Funds Settlement Instructions. The primary limit on capacity in

RIX is the interface to SWIFT. The Riksbank continuously evaluates whether this capacity needs to be increased further. The RTGS system itself can process considerably more Funds Settlement Instructions than the SWIFT interface can deliver. The actual capacity is tested whenever new versions are implemented. The excess capacity in RIX and the scalability in the SWIFT interface mean that there is a large degree of scalability in the system. Planned changes in the use of the system are discussed at least yearly in meetings with participants so that capacity issues can be addressed.

The full capacity of the system, including the SWIFT interface, is used only during the period between 09:30 and 11:00, which is referred to as the Peak Period. At 11:00, 80 % of the daily settlement volumes and 57 % of the daily settlement values have been processed. The Riksbank and participants are aware of the concentration of payments and work to reduce the concentration and the risks associated with this. If the opening hours were utilised in a more efficient way, the average processing time for payments would decrease, as would operational risk. The Riksbank is in dialogue with participants to find ways to spread payments over the settlement day and reduce the concentration of payments to the Peak Period.

RIX-RTGS has strict physical security requirements and these are met by multi-layered security measures. Access to the Riksbank is restricted by individual controls. All work stations for RIX are also restricted to specific individuals with proper identification. The system's components are placed in separate data centres. These data centres are only accessible for authorised personnel. The Riksbank applies security such as guards 24/7/365, burglar alarms and fire alarms. The level of physical protection follows best practice among central banks. Security always has top priority in construction projects and other changes to the physical environment.

The Riksbank applies an Information Security Framework that originates from the ISO 27000 standard and was cooperatively developed by the European System of Central Banks. In accordance with this, the RIX system has strict information security requirements which are continuously monitored. These include intrusion detection, logging, anti-virus protection, strict access controls, and strong authentication. All relevant IT-security measures are in place and updated on a regular basis. The relevant system's components and environment are monitored 24/7/365. The Riksbank's IT security measures are reviewed at least once a year. The Riksbank's Security Framework is tailored to ensure proper handling of IT-security requirements both in projects and whenever changes are made to the applications. In connection with a change, the Riksbank follows a process which includes identification of relevant IT-security measures, analysis of their effectiveness, design, implementation and review of the measures. The aforementioned policy for operational risk includes information security and cyber-related risks. These types of risks are therefore considered in all operations conducted by the Riksbank.. The Riksbank imposes cyber-related requirements on IT-providers and evaluates fulfilment of said requirements regularly. The Riksbank also participates in the SWIFT Customer Security Program, which focuses on cyber security.

To manage its dependence on the IT-system provider, the Riksbank sets strict requirements on the service supplied by the IT provider and on the IT provider's security arrangements. The Riksbank checks that these requirements are met through regular meetings and on-site visits. In addition, the Riksbank rigorously tests all deliveries from the system provider.

RIX-INST

The Eurosystems's operational reliability objectives for the TIPS platform are; a technical availability of 99.9 per cent⁶²; a maximum time of unavailability of 15 minutes starting from the time when the decision to restart the service is made up to the time the service is restored.⁶³

The TIPS platform, as a whole and not specifically for RIX-INST, shall be able to process up to an average number of 500 incoming instant payment transactions per second, with a peak of up to 2,000 incoming instant payment transactions per second.⁶⁴ The TIPS platform shall ensure completing all its processing tasks within 5 seconds for 99% of the processed instant payment transactions.⁶⁵ The TIPS platform shall scale up to handle, with the same execution time, a doubling of the instant payments peak throughput in one year.⁶⁶

Business continuity

The Riksbank aims to safeguard that its settlement services are available without unnecessary interruptions during its respective opening hours. However, the means to achieve this is somewhat different between the settlement services.

The RIX system and support systems can be run from additional sites that are operated on hot stand-by. These sites have different risk profiles.

RIX-RTGS

Together with the reserve routines for RIX-RTGS, the business continuity plan (BCP) is designed so that the Riksbank can provide safe service to RIX-RTGS participants even in extreme circumstances. The objective of the Riksbank's BCP is that operations will not be interrupted or, in a worst-case scenario, will be resumed within two hours, and that all settlement will be completed by the end of the day. In this way, the BCP supports the Riksbank's objectives for RIX. This BCP is reviewed in conjunction with the various tests of BCP procedures. The business continuity arrangements for RIX-RTGS

⁶² TIPS User Requirements Document, version 1.1.3, Section 10.1, requirement TIPS.UR.10.020, available on the web-site of the European Central Bank.

⁶³ TIPS User Requirements Document, version 1.1.3, Section 10.2.2, requirement TIPS.UR.10.050, available on the web-site of the European Central Bank.

⁶⁴ TIPS User Requirements Document, version 1.1.3, Section 10.7, requirement TIPS.UR.10.120, available on the web-site of the European Central Bank.

⁶⁵ TIPS User Requirements Document, version 1.1.3, Section 10.7, requirement TIPS.UR.10.130, available on the web-site of the European Central Bank.

⁶⁶ TIPS User Requirements Document, version 1.1.3, Section 10.7, requirement TIPS.UR.10.131, available on the web-site of the European Central Bank.

are tested and reviewed regularly, some monthly and others at least once a year. Liquidity transfers between RIX-RTGS and RIX-INST are also tested and a part of the Riksbank's plan.

To meet the Riksbank's BCP objectives, the Riksbank has established different sites from which the RIX-RTGS system and all support systems can be run. There are also different locations with workplaces from which the Riksbank's staff can work with the system and with manual routines. The Riksbank has also established an alternative communications channel which does not depend on SWIFT. In addition, as a final backup the Riksbank has developed and regularly tests manual procedures for payments which are designed to allow all settlement to be completed by the end of an extended settlement day.

For extreme circumstances, the Riksbank has also developed manual routines which can be carried out from an alternative work place. As described above, the Riksbank and the RIX-RTGS participants have well-tested routines to ensure that payments will be settled manually if the system is affected.

In accordance with the BCP, the Riksbank will rely on manual procedures if there is a wide-scale catastrophe making its data centres unavailable. The Riksbank and the RIX-RTGS participants have routines to allow Funds Settlement Instructions to be settled through these manual procedures. The Riksbank tests manual procedures twice a year with the objective of being able to settle all transactions during an extended business day even if SWIFT and both Riksbank sites are unavailable. Liquidity transfers between RIX RTGS and RIX INST are also tested in this scenario. To ensure that the status of transactions can be identified and to mitigate the risk of data loss, the Riksbank mirrors information to an independent application. Through this application, the Riksbank can receive the latest Funds Settlement Instructions and account specifications for all participants from the time of the disruption as a starting point for manual routines.

The Riksbank has continuity measures to maintain communications with the RIX system if SWIFT fails. RIX-RTGS Online is a web-based transfer system interface through which participants can manage their liquidity and Funds Settlement Instructions if SWIFT fails. All participants are required to be able to manage their transactions via RIX-RTGS Online and communicate with the Riksbank through the procured communication channel Verizon Financial Network (VFN) or via the internet. The use of RIX Online is tested regularly.

The Riksbank has developed an incident and crisis management plan to handle incidents and crises that affect RIX-RTGS. This plan includes a description of roles and responsibilities, a communications plan and routines for spreading information to participants and for gathering information from them. The communications plan covers all relevant internal and external stakeholders. The same plan is used for smaller incidents and larger events. This means that the basic elements of the plan are utilised regularly and that the staff is familiar with the elements of the plan. Plans for crisis

management and crisis communication for RIX-RTGS are tested and updated regularly. The crisis communication plan involves internal and external information in addition to the information sent to all RIX participants.

RIX-INST

The TIPS platform used by the RIX-INST settlement service operates 24 hours per day and is technically designed to handle change management without the need of any maintenance window. However, there may be cases that require stopping the TIPS platform temporarily and according to a pre-agreed unavailability period.

Contrary to RIX-RTGS there are no contingency procedures that allow manual settlement of payments. Manual settlement will not be possible taking into consideration the volume of payments to be handled. However, with respect to liquidity transfers between RIX-RTGS and RIX-INST there are in place contingency procedures that allow manual settlement of such liquidity transfers in case unavailability of the RIX-RTGS system or the normal communication network between RIX-RTGS and RIX-INST.

The incident and crisis management plan to handle incidents and crisis that affect the RIX-INST service is under development. The general operational procedures for the TIPS platform, including incident and crisis management, are however developed.

Risks from other entities

As part of its annual review of operational risks, the Riksbank evaluates the risks it bears from other entities. It also identifies and assesses the risks to IT-system and messaging and telecommunications service providers.

The requirements for participation in RIX are objective and aim to ensure that participants have the financial, technical and organisational basis for using the system without causing problems for other members. Upon request, the Riksbank offers both theoretical and practical training in the RIX system and its features to all RIX participants. New participants are trained in RIX and its operations prior to going live. After training and before participants are permitted to access the system, practical tests are carried out in RIX to verify correct use of the system. The Riksbank performs an evaluation, in general every second to third year, of whether all participants meet the operational and technical requirements that are set out in the Terms and Conditions. For more information regarding the rules for participating in RIX, see Principle 18.

To evaluate the risks which the RIX system poses to those FMIs which settle their payments in RIX, the Riksbank considers the criticality of different payments.

RIX-RTGS

The Riksbank identifies and assesses the risks posed by allowing Euroclear Sweden to administer central bank accounts on behalf of the Riksbank for payments in relation to securities settlement. To mitigate the risks associated with Euroclear Sweden administering central bank accounts, the Riksbank and Euroclear Sweden have established reserve routines.

To mitigate its dependence on service providers, the Riksbank attempts to establish redundant sources of service and to have contingency procedures. To manage its dependencies on telecommunications service providers, the Riksbank has different premises with different risk profiles as described above. To manage its dependence on messaging services, the Riksbank requires that participants have two ways of sending messages to the Riksbank.

With respect to criticality, the Riksbank has identified the payments to and from clearing houses (including CLS Bank), the securities settlement system and central counterparties as particularly critical. The Riksbank has business continuity plans, as described above, aimed at maintaining service levels. Should there be problems with communication, the Riksbank has back-up workstations which participants may use. As previously mentioned, the Riksbank also maintains manual procedures to allow for settlement even if there is no system support.

RIX-INST

With respect to the risks from messaging services the participant in RIX-INST has to have an agreement with a Network Service Provider (NSP) chosen by the participant among those accepted by the Eurosystem (currently two). The Riksbank's NSP, SWIFT, handles the communication between RIX-RTGS and RIX-RTGS relating to liquidity transfers as well as reporting from RIX-INST and certain information services in RIX-RTGS. For participants the NSP will handle the communication to RIX-INST with respect to payments as well as for reporting from RIX-INST. The Riksbank does not require that a participant uses two different NSPs.

RIX-INST will be used for a payment service that is critical for the participants' customers. The operator of this service as well as the party chosen by the Swedish market to be the single interface to RIX-INST and their providers are critical to the effectiveness of the settlement service. As previously mentioned, the Riksbank do not maintain manual procedures to allow for settlement of these payments even if there is no system support.

Cooperation with other stakeholders

The Riksbank is represented in FSPOS (a Swedish financial sector private-public collaboration group). For instance, the Payment System Division takes part in identifying interdependencies in the Swedish financial sector and in preparing and participating in contingency within the financial community and among the RIX participants. In addition the Riksbank is a part of TIBER-SE⁶⁷.

⁶⁷ The national Swedish adaptation of TIBER-EU (Threat Intelligence-based Ethical Red Teaming), a framework developed by the ECB that makes it possible to test, in a standardised way, resilience to cyber risks among players in the financial system.

4.14 Principle 18: Access and participation requirements

An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.

Key conclusions

The Riksbank has participation criteria which are clear, fair and publicly disclosed. The criteria are focused on ensuring that the participant has the technical, operational and financial capacity to fulfil its obligations as a participant of the payment system. The Riksbank follows up participants regularly and clarifies the rights and obligations of both the Riksbank and participants.

Participation requirements

An Institution that fulfils the relevant access criteria may, after application and consideration in accordance with the general aspects and examination of the application, be invited to sign the Accession Agreement. By signing the relevant Accession Agreement with the Riksbank, an Institution receives the rights and obligations in relation to the Riksbank that are set out in the relevant parts of the Terms and Conditions for RIX and Monetary Policy Instruments (the Terms and conditions). For parties hired by Institutions, the Institution is responsible towards the Riksbank regarding obligations set out in the Terms and Conditions.

The RIX Settlement System consists of two different Settlement Services, RIX-RTGS and RIX-INST. An Institution becomes a RIX Participant via the Accession Agreement and can then choose to be certified for one or both of the Settlement Services. An Institution certified for just one of the Settlement Services only receives the rights and obligations applicable to the Settlement Service for which the Institution is certified.

The terms for participation in RIX are stipulated in the Riksbank's Terms and Conditions. The Terms and Conditions are the conditions of the agreement that apply for participants in RIX, they consist of a Master document with four annexes. The Terms and Conditions also contain references to different types of instructions and terms. The Terms, Conditions, and instructions are available to all participants and the general public on the Riksbank's website. The Riksbank will refer prospective participants to the publications on the website for initial analysis. Credit institutions, clearing organisations, the Swedish National Debt Office and investment firms may participate in RIX. Foreign institutions may also be participants.⁶⁸ Swedish banks and other credit institutions, foreign banks, clearing organisations, one government agency and the Riksbank currently participate in RIX. The Counterparty Application Instructions complements the Terms and Conditions with the aim of facilitating the application process for institutions wishing to become RIX Participant.

⁶⁸ This includes both those with and those without branches in Sweden.

The requirements for participation in RIX are objective and aim to ensure that participants have the financial, technical and organisational basis for using the system without causing problems for other members. The requirements can be met by institutions of different sizes, business models and countries of domicile. The Riksbank implements these requirements in an impartial way. The assessment of the application for participation in the RIX system conforms to the principles of free access and neutrality. Applications from institutions seeking participation in RIX are subject to the same process and the same supporting documents are required.

Most of the access requirements aim to limit operational risks to the system. The applicant must have an organisation, technical systems, personnel and routines which allow it to manage its payments in RIX safely. The applicant shall demonstrate that it has sufficient resources to handle the daily management of its work in RIX. It must also have sufficient personnel responsible for settling payments who have adequate knowledge of RIX. There should be well-documented and established procedures for personnel who work actively in RIX. The applicant must have well-developed procedures and systems for dealing with situations where the RIX system or participants themselves are affected by a disruption in the normal communication system. These must be geared to managing disruptions in the system to reduce risks in the payment flow. This means that the participant is well equipped to operate during shorter or longer disruptions. The participant must also have sufficient resources for the management of contingency procedures. To mitigate legal risk, a number of the requirements cover legal issues. The applicant shall have valid legal status and the capacity to assume with binding effect the rights and obligations resulting from the Terms and Conditions. In addition, foreign participants must provide evidence that the Terms and Conditions are valid in their country of domicile.

The Riksbank does not differentiate between participants in regards to participation requirements. The same criteria must be met whether participants are Swedish institutions, foreign banks, central securities depositories or clearing organisations. However, an institution which has its registered office outside Sweden must provide a statement detailing legal acts in the applicant's country of domicile that are of significance for the validity and applicability of the Terms and Conditions in that country.

The Riksbank's cross-departmental committee regularly reviews the participation requirements. Meetings are held when business requires, but at least once every three months. The Terms, Conditions and Instructions are circulated to the RIX participants every time they are amended or updated.

RIX-RTGS

A RIX-RTGS Participant is a RIX Participant certified for the RIX-RTGS Settlement Service.

A RIX-RTGS Participant can choose to provide settlement service to its customers, handle and be responsible for that customer's payments in RIX-RTGS.

Customers of RIX-RTGS participants have no relationship with the Riksbank.

RIX-INST

A RIX-INST Participant is a RIX Participant certified for the RIX-INST Settlement Service.

To enable the possibility of participation in only RIX-INST, a RIX-INST Participant that does not participate in RIX-RTGS shall have an agreement with a RIX-RTGS Participant. The RIX-RTGS Participant then acts as RIX-RTGS Agent for the RIX-INST Participant. The RIX-RTGS Agent needs to submit its consent to be charged fees and interest on behalf of the RIX-INST participant. Furthermore, the RIX-INST Participant shall have an agreement with a RIX-RTGS Participant for the transfer of liquidity to the RIX-INST Participant's account in RIX-INST.

A RIX-INST Participant has the right to send and receive information to and from RIX-INST via another actor who acts as Instructing Party and has received special power of attorney from a RIX-INST Participant. As the Instructing Party does not have a relationship with the Riksbank, the Riksbank can refuse to allow a RIX-INST Participant to use a specific actor as an Instructing Party if the Riksbank judges that the use of the Instructing Party may in any way add a major risk to the system. A RIX-INST Participant can also allow others to act as Authorised Account Users. These users are called Reachable Parties in RIX-INST. This applies to other institutes owned by the RIX-INST Participant itself and institutes owned by another legal entity. Only Payment Service Providers can be Reachable Parties. All Indirect Participants in RIX-INST shall be registered as Reachable Parties.

Cost recovery

The Riksbank applies the principle of full cost recovery. The RIX system has a limited number of participants and the fixed costs make up a large proportion of the costs for the RIX system. This implies that the transaction cost of using the system will be higher for participants with small transaction volumes. However, the same pricing model is used for all participants. The Riksbank may charge a RIX participant for development costs in connection with its accession to RIX or the development of new services or for other costs not included in the basis for fee-setting.

Evaluation of participants

The Riksbank's and the RIX participants' rights and obligations in RIX are regulated in the Terms and Conditions. The Riksbank performs an evaluation, every second to third year, of whether all participants meet all the requirements that are set out in the Terms and Conditions. Under the Terms and Conditions, the requirements shall be fulfilled for as long as the institution is a participant. According to the Terms and Conditions, the participant shall voluntarily inform the Riksbank of any changes that might be significant either for its fulfilment of the qualification requirements or for the functioning of RIX. The Riksbank has a good dialogue with Finansinspektionen, the Swedish FSA, through which it can receive information about domestic and foreign banks. It is only possible for the Riksbank to receive information about foreign banks through Finansinspektionen as they receive information and warnings from the domestic FSAs'. This allows the Riksbank to identify participants whose risk profile deteriorates.

For parties hired by RIX-participants and for customers to the RIX- participant, the RIX-RTGS participant itself is responsible towards the Riksbank regarding obligations set out in the Terms and Conditions. This applies regardless of settlement service in RIX.

Exclusion of participants

The Riksbank has the right to exclude a RIX participant for a number of reasons, including when the participant no longer fulfils participation requirements and when the participant does not follow the Terms and Conditions. In addition to the causes for exclusion from RIX, the Terms and Conditions⁶⁹specify the procedures which the Riksbank shall follow in relation to exclusion of the participant and in relation to other RIX participants. The Terms and Conditions allow the Riksbank to exclude a participant from some or all RIX services if there is cause. Information about causes for exclusion, rights in connection with an exclusion and requirements for warning and information are publicly available in the Terms and Conditions. The Riksbank's internal processes are not public.

⁶⁹ [Terms and Conditions for RIX and Monetary Policy Instruments](#)

4.15 Principle 19: Tiered participation arrangements

An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.

Key conclusions

Tiering is not deemed to constitute a material risk to RIX. RIX-RTGS operates on a RTGS basis so that transactions are not directly interdependent and the Riksbank supplies intraday liquidity to reduce the effects of any disturbances caused by unexpected liquidity shortfalls. RIX-INST settles the transactions interdependent one by one instantly. The Riksbank has the facilities to observe payment activity and liquidity in the system. The fund settlement instructions sent in RIX-RTGS and RIX-INST contain information that shows both the sending institution and the ultimate beneficiary, allowing the Riksbank to get information on indirect participants. Moreover, the Riksbank regularly performs an analysis of activity by indirect participants in RIX-RTGS and plans to expand the analysis to also include RIX-INST payment flows in the future.

RIX

The Riksbank has contractual agreements with RIX participants and has no relationship to indirect participants defined according to the CPMI IOSCO principles. Therefore, the Riksbank has neither obligations toward nor interaction with indirect participants. Thus, the material issue here is the extent to which indirect participants threaten the functioning of RIX or the risks that RIX participants face in settling transactions.

By having participation requirements that make it possible for financial institutions holding the appropriate license to participate in RIX, the Riksbank mitigates the risk that financial institutions responsible for a large part of the payment flows in RIX will act through an established participant and thereby face and cause counterparty exposures.

RIX-RTGS

The Riksbank analyses the criticality of different types of payments. In particular in RIX-RTGS, it has identified payments to and from clearing houses (including CLS Bank), the securities settlement system and central counterparties as particularly critical. The Riksbank discusses payments with these FMIs and should such an FMI employ another RIX-RTGS participant to settle its payments, the Riksbank receives information about this in discussion with the FMI. In general, the Riksbank strives to have participation requirements and services which encourage FMIs to manage their own transactions. The Riksbank follows the relative size of the transaction flows and each participant manages and notes whether these flows stem from payments to clearing houses and securities settlement systems, interbank payments or other types of payment. The Riksbank can also analyse liquidity usage in the system and when necessary follow the liquidity of individual participants.

Nothing in the design, schedule or operation of RIX-RTGS forces a participant to take on exposures in relation to its indirect participants. The RTGS functionality, the possibility to send payments throughout the payment day and the coordination of RIX-RTGS operating hours with those of the Swedish clearing houses and securities settlement system are all designed to reduce the risks associated with using RIX-RTGS. Thus, it is difficult to identify any material dependencies between direct and indirect participants which will affect RIX-RTGS itself or the RIX-RTGS participants through their settlement. Furthermore, the Riksbank has participation requirements which allow sound financial institutions which meet minimum requirements to use the system directly, if they so choose.

The Riksbank regularly performs an analysis of activity in the payment system by indirect participants. The analysis covers several different aspects in relation to indirect participants and their payment flows in RIX-RTGS. Some of the aspects analysed are: identification of the 20 largest indirect participants in terms of both value and transaction volume; and the proportion of settled value and transaction volume in relation to the direct participant and in relation to the payment system. The last investigation with data from 2018 concluded that the level of indirect participation on the sender side is relatively high. However, the investigation shows that significant indirect participants often use two or more settlement banks for their cash flows thereby lowering the risk. In addition to the analysis described, knowledge of each participant's business allows the Riksbank to note any changes in payment patterns or activity, and if necessary undertake a more extensive analysis when applicable. The next analysis is planned to start in 2022 using data from 2022.

RIX-INST

In RIX-INST it is possible for a participant to enable an indirect participant's payments to be sent to RIX-INST in the indirect participant's own name (identity). However, such payments will settle on the participant's account, either directly on an account or through a CMB⁷⁰ connected to the participant account. In addition, it is possible to set a limit on the CMB which is one way for the RIX-INST participant to reduce the risks from their indirect participants. If needed it is also possible for the RIX-INST participant to block the CMB so no more payments can settle. It is also possible for the RIX-INST participant to allow the indirect participant to send their payments directly to RIX-INST and allow them to send a limited set of queries.

The Riksbank aims to include payment flows in RIX-INST in the analysis of indirect participation in the future. A plan for the analysis will be identified for 2023.

⁷⁰ Credit Memorandum Balance, for more information please see the RIX-INST Instructions chapter 11, <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/conditions-and-instructions/>.

4.16 Principle 21: Efficiency and effectiveness

An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.

Key conclusions

The RIX system is designed to meet the needs of its participants and the Swedish market. The implementation of RIX settlement services, the liquidity optimizing mechanisms and the settlement schedule are designed in consideration of participants' needs and the costs they face in using the system. The Riksbank monitors its costs and is transparent toward RIX participants about the costs and fees for using the services. The RIX system has two measurable objectives: technical availability and the principle of full cost coverage. The last three years both the objective of full cost coverage and technical availability of RIX-RTGS have been fully met.

System functionality

The design, rules and procedures for RIX system have been developed to meet the needs of the Swedish market. The RIX system contains both settlement services; RIX-RTGS and RIX-INST. Participants can choose to be certified and participate in one or both settlement services.

RIX-RTGS

The RIX-RTGS settlement procedure is designed in such a way that it does not build up exposures between participants. Payments and liquidity transfers are settled immediately, provided that the payer has available liquidity. To reduce the risk of settlements not being performed due to participants lacking liquidity, the Riksbank can provide liquidity by granting intraday credit to RIX-RTGS participants against collateral. This collateral consists primarily of Swedish and foreign securities with good credit rating, but may also be foreign currency in an account at a central bank. The provision of intraday credit reduces the risk for delayed payments due to lack of liquidity. Prompt completion of payments increases the efficiency of the payment system. Another efficiency-enhancing design is that the queue management in the RIX-RTGS system is constructed so that if the first payment is not possible to settle due to a lack of liquidity, the system will check if the next payment, which can be at a lower amount, can be conducted. If so, the payment is duly settled.

Participants themselves determine how they will use the system, given the technical restrictions and the Riksbank's security standards. Thus, participants have agreed upon a system of clearing codes used in the RIX-RTGS system that defines and identifies the payment type referred to and which LOM⁷¹ account the payment should use. This also positively affects efficiency. Payments can be included in RIX-RTGS for settlement at any time during its opening hours. There are no amount limits in the system.

⁷¹ Liquidity Optimising Mechanism

The majority of payments are settled in accordance with the "Agreement on domestic settlement and netting between participants in the RIX-RTGS system" (Settlement Agreement), developed by the Swedish Bankers' Association. This agreement includes the timing of when different types of clearing products will be settled, allowing participants to be able to plan and predict when various kinds of payment are made.

Payment notices in the RIX-RTGS system comply with the international standard, developed by SWIFT which is also the message format used in many of the banks' internal systems, thereby facilitating so-called Straight Through Processing, which improves efficiency and allows for a safer flow of payments.

RIX-INST

The design, rules and procedures for RIX-INST have been enhanced to meet the needs of the Swedish market. The design of the settlement procedure is based on settlement of individual payments in central bank money round the clock (24/7). To provide the service, the Riksbank uses the technical platform developed by the Eurosystem for the TARGET Instant Payment Settlement (TIPS) service. TIPS is a shared platform used by several central banks and by their respective communities. The RIX-INST settlement procedure is designed in such a way that it does not build up exposures between participants. Payments and Liquidity transfers are settled immediately 24/7, with the exception of between 18:00 CET and 19:00 CET when Liquidity transfers to or from RIX-INST cannot be made. In order to facilitate an efficient 24/7 settlement of payments, the Riksbank offers the possibility to transfer liquidity from RIX-RTGS to RIX-INST. Additionally, intraday credit can be granted in RIX-RTGS for the same purpose.

Development of new functionality

The Riksbank can offer some additional payment services closely linked to the operation of the large value payment system. If a request for additional payment services is consistent with the Riksbank's mandate as the Swedish central bank it will be evaluated by the Riksbank following the New Product Approval Process (NPAP).

In all cases, willingness to provide a service to one participant means that the service will be offered to all participants that meet the same conditions. Thus, in connection with the RIX-RTGS system, the Riksbank provides specific accounts and loans during the day to make the settlement of securities transactions more efficient. Euroclear Sweden, the Swedish central securities depository, manages these accounts and loans on behalf of the Riksbank. Furthermore, in order to facilitate for instant payments in central bank money, the Riksbank provides the RIX-INST service, which is available for all participants that meet the same conditions and become certified.

The Riksbank collects input about participants' requirements and satisfaction with the system in a number of different ways. The Riksbank has established a number of different forums such as the RIX User Group and the RIX Council. The RIX User Group is a collaborative group in which all participants are represented. It prepares and presents proposals for further development of RIX. The RIX Council is a group that discusses strategic issues related to the provision of systems and payment services, such as

goals and conditions, costs, fees and pricing, crisis and continuity issues, regulatory issues, project issues, and IT services. These forums result in a high level of transparency. Both can establish working groups to concentrate on special issues.

Development in the RIX-INST service needs to be assessed with regard to the fact that the settlement system is a shared platform between several central banks and different currencies. Any changes or requests need approval from the Eurosystem. In order to convey the Swedish community's requests and requirements to the Eurosystem, the Riksbank participates in a consultative forum called TIPS Consultative Group.

In addition to these channels for obtaining feedback from participants, the Riksbank gathers information on developments in regulation and in the large value payment market to attempt to be proactive in developing the system to satisfy participant's needs.

Objectives

As described in Principle 2, by law, the overriding objective of the Riksbank in providing the payment system is to contribute to a safe and efficient payment system. The RIX system contributes to this by providing a means for RIX participants to make large, critical and instant payments without credit risk and with access to liquidity in the form of intraday credit in RIX-RTGS.

To assess how the operation of the RIX system contributes to meeting the Riksbank's objective of promoting a safe and efficient payment system, the Riksbank has established concrete measurable operational objectives. These are:

- technical availability of 99,85%
- full cost recovery

Every four months, the Riksbank evaluates how well its goals and objectives are being met. When it comes to technical availability the target has been met in the past three years; 2019 (99.97%), 2020 (100%) and 2021 (99,85%), where it just met the objective of 99,85%. In its annual report, the Riksbank reports on how well these objectives have been met.⁷² This report is audited as described in Principle 2.

As the Riksbank does not operate the technical platform that RIX-INST utilises for settlement of instant payments, the technical availability objective cannot be applied to the RIX-INST service. The Riksbank cooperates with the Eurosystem and RIX-INST participants for any enhancements in the RIX-INST settlement platform with regard to what the Swedish community deems necessary for an efficient settlement of instant payments in Swedish krona. Full cost recovery for RIX-INST applies.

The Riksbank conducts client surveys every second year with the purpose of ascertaining how the users of the payment system perceive the Riksbank's services. The survey

⁷² The annual report 2019, 2020 and 2021, <https://www.riksbank.se/en-gb/press-and-published/publications/annual-report/>

takes the form of a questionnaire and forms the basis of continued work with the RIX system.

As result of its budget process, the Riksbank has established mechanisms for the regular review of costs and the pricing structure. Participants are informed about the Riksbank's expenditures and revenues for the payment system as well as the way the costs are recovered. To ensure effectiveness, the Riksbank applies careful risk management methods to achieve the low-risk environment suited for a large value payment system integrated with a settlement service for instant payments.

4.17 Principle 22: Communication procedures and standards

An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.

Key conclusions

RIX-RTGS uses the SWIFT network and SWIFT MT standard messages for all payments settled in RIX-RTGS and for information to its participants. The ISO standard ISO 20022 is used for communication between RIX-RTGS and RIX-INST as well as for payments settled in RIX-INST.

RIX

The RIX system operates on both SWIFT MT Standard and ISO 20022 Standard depending on which service is used for settlement of payments. For communication between RIX-RTGS and RIX-INST the ISO 20022 standard is used. This is with regard to liquidity transfers, operating schedule information and account balances from RIX-INST.

RIX-RTGS

Communication between RIX-RTGS and its participants takes place on the SWIFT network using FIN-Copy for all Fund Settlement Instructions.⁷³ In addition, RIX-RTGS provides a service which allows participants to enter their Fund Settlement Instructions manually via a web-client application accessed through a web browser.. All communication on the SWIFT network follows international standards and procedures for communication. The communication lines have been set up with full redundancy such that there are duplicated and separated communication lines from two different suppliers. The communication between RIX and all its participants is encrypted using PKI architecture. RIX-RTGS only communicates with its participants, i.e. there is no direct communication with participants' customers.

The collateral management system communicates with some institutions providing custody services via the SWIFT network using SWIFT MT message standards.

The contingency communication procedure (RIX Online application) supports a manual input of payments in RIX when SWIFT is not available for the individual participant. With RIX Online, transactions are registered in a non-SWIFT-based graphic user interface. These transactions are then converted to SWIFT MT standard and sent out via the SWIFT network and, upon returning to RIX, processed exactly the same way as instructions sent directly from the participant and received via the SWIFT network. RIX Online can be accessed either through Verizon network or through the Internet.

⁷³ The topology is a standard Y-copy using full copy of the original message.

RIX-INST

RIX-INST is using the ISO20022 message standard. The TIPS platform that RIX-INST uses for settlement is following the rulebook for SEPA Instant Credit Transfer (SCT Inst)⁷⁴. It is intended that RIX-INST should support the NPC Instant Credit Transfer (NCT Inst)⁷⁵. However, RIX-INST is using the 2019 version of ISO 20022 for certain messages, while NCT Inst is expected to move to that version only in November 2023.

⁷⁴ 2019 SEPA Instant Credit Transfer Rulebook version 1.2, 30 October 2020. Produced by the European Payments Council (EPC).

⁷⁵ 2023 NPC Instant Credit Transfer Scheme Rulebook version 1.1. Produced by the Nordic Payment Council (NPC)

4.18 Principle 23: Disclosure of rules, key procedures, and market data

An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.

Key conclusions

The Riksbank publishes the Terms and Conditions for RIX and its underlying Settlement Services, RIX-RTGS and RIX-INST, descriptions of routines and procedures, fee information, statistics, information about operations and incidents and information about participation on its website. The Riksbank provides participants with relevant training for participating in RIX and its underlying Settlement Services, RIX-RTGS and RIX-INST. These sources of information allow participants to understand the risks and costs associated with participating in RIX and its underlying Settlement Services, RIX-RTGS and RIX-INST.

Terms and conditions

The Riksbank's Terms and Conditions are comprehensive and clear and provide participants with adequate information as to how RIX-RTGS and RIX-INST functions and the requirements for participants in the systems, as well as the obligations of the Riksbank and how various situations must be handled. The Terms and Conditions consist of a Master Document with four annexes, one of which is an instruction, the Collateral Instructions. The Terms and Conditions also contain references to different types of instructions and terms: RIX-RTGS Instructions, RIX-INST Instructions, Counterparty Application Instructions, RIX Account terms and Special terms for deposit facility for central counterparties.

- The Master Document contains access criteria for participation in RIX, general requirements, conditions for exclusion and other sanctions, liability for compensation as well as applicable legislation and resolution of disputes. The Master Document also includes special conditions for Funds Settlement Instructions in RIX-RTGS as well as for RIX-INST, communication and back-up, technical connections and intraday credit. It describes the rights and obligations of the Riksbank and participants.

- The Collateral Instructions contain a summary of the regulations and routines applicable to management of collateral in RIX and to monetary policy instruments. They also describe the eligibility requirements for securities to be used as collateral for credit in RIX (intraday credit). The document contains practical descriptions and examples of how the Riksbank processes and assesses collateral and collateral arrangements, and contact information for questions regarding collateral.
- The Counterparty Application Instructions facilitate the application process for institutions wishing to become a RIX participant.
- The RIX-RTGS Instructions and the RIX-INST Instructions describe the use of RIX-RTGS and RIX-INST by RIX participants and the Riksbank, the technical infrastructure which supports the system, administration of users and authorisations, activities associated with participation in RIX, basic data, account management, liquidity management, settlement procedures, notifications and monitoring, message formats and contingency routines.

Current versions of the Master Document, Instructions and terms are available to the general public and prospective participants on the Riksbank's website. Amendments and updates are always circulated to RIX participants. The Instructions for RIX two settlement services provide detailed information on the functions of RIX-RTGS and RIX-INST, message formats, operational risk management, instructions for disruptions and descriptions of available backup features. The Terms and Conditions provide participants with adequate information about the risks of participating in the RIX system. The Riksbank conducts a periodic review of the Riksbank's Terms and Conditions. Amendments to the Terms and Conditions are handled in an internal cross-departmental committee. The committee is a forum that coordinates and prepares decisions on changes to the Terms and Conditions and coordination of operational issues concerning application of the Terms and Conditions. The Terms and Conditions also describe how amendments to the Terms and Conditions can be made. Ordinarily, before the Riksbank may make a material change in the Terms and Conditions, participants must be consulted and they must have thirty days to provide their views. If there are views expressed during the consultation, they will be handled in the internal cross-departmental committee. Once a decision has been made to amend the Terms and Conditions, participants are given a notice of at least fifteen days before the change is implemented. However, no consultation is necessary for changes to the Terms and Conditions that are editorial in nature or necessitated by changes in the functioning of the system.

Reports

The Riksbank generates a monthly letter, the letter give an account of statistics and provide a summary of changes to the list of participants, incidents and other events affecting RIX. The report is circulated to RIX participants.

Training

Upon request, the Riksbank offers both theoretical and practical training about RIX and the settlement services RIX-RTGS and RIX-INST and its features to all RIX participants. New participants are trained in the RIX system and its operations prior to going live. After training and before participants are permitted to access the system, practical tests are carried out in RIX to verify correct use of the system and its underlying settlement systems.

The Riksbank has procedures for monitoring how institutions use the system. This provide indications of how well the participant understands the routines, procedures and risks associated with RIX. The operational staff at the Riksbank maintain contact with participants so that any questions can be raised informally without delay. Should issues remain, procedures for more formal discussions are employed. Finally, should serious problems remain, the Terms and Conditions provide for sanctions and exclusion.

The Riksbank provides the following documentation to facilitate participants' understanding of the RIX system, rules and procedures:

- The Guide for registration in RIX-RTGS Online provides the user with information on the payment process, role of RIX-RTGS and its functionality. It serves as an operational guide to users of RIX-RTGS Online and is part of the Riksbank's training material.
- Annex A7, Special instructions for dealing with disruptions, provides information to RIX-RTGS participants on how to act to minimise the negative effects of a disruption.
- Instructions for functions in RIX-RTGS related to RIX-INST, describes the functions in RIX-RTGS that are related to RIX-INST. Instructions that are sent by the participant shall be designed according to the specifications in the document.
- RIX-INST Instructions for dealing with disruptions provides information to RIX-INST participants on how to act in order to minimise the negative effects of a disruption.

Cost and prices

The price list for RIX and the underlying settlement services RIX-RTGS and RIX-INST is published on the Riksbank's website⁷⁶. A RIX Participant must pay fees to the Riksbank in accordance with the price list applied by the Riksbank. Fees are set on the principles of full cost coverage and non-discrimination. When the Riksbank takes a decision to change charges for the RIX services , a proposal for pricing of RIX is prepared. The

⁷⁶ Price list for RIX, <https://www.riksbank.se/en-gb/payments--cash/the-payment-system---rix/participating-in-rix/price-list/>

proposal describes the principles for pricing and how the cost base has been calculated. The proposal for the RIX service charges is then presented at the meeting of the RIX Council. Subsequently, RIX participants are invited to express their opinions.

The Riksbank regularly informs participants about costs and revenues and how these may affect fees. Participants are then informed about pricing for the coming year at least 30 days before the new prices come into effect.

The starting point for pricing is that all internal and external resources are included in the cost base. The Riksbank's principles for pricing are that costs should be fully covered and extraordinary costs should be evaluated on a case-by-case basis. The cost base shall be determined according to general principles for the allocation of costs within the Riksbank. Moreover, it shall include part of the IT and personnel costs related to management and security issues and capital costs.

RIX-RTGS

The fees are designed to promote the use of RIX-RTGS for the settlement of large value payments. The fees are made up of a fixed and a variable portion. Comparing the cost of RIX-RTGS payments with those in other payment systems may be difficult in as much as there is an additional fee for very large institutions and in as much as the implicit cost of intraday credit is difficult to calculate.

The Riksbank's pricing model for the RIX-RTGS settlement service consists of:

- Entry fee for new RIX-RTGS participants
- Fixed monthly fee for all institutions,
- Fixed monthly fee for all institutions with the possibility to exercise their right to credit in RIX through grant of pledge,
- Additional fee paid monthly for institutions with "domestic revenues" of at least SEK 1 billion, to be divided between these institutions based on their individual "domestic revenues" and
- Fee per payment order sent,

RIX-INST

The fees for the RIX-INST settlement service are made up of a fixed and a variable portion.

The Riksbank's pricing model for the RIX-INST settlement service consists of:

- Entry fee for new RIX-INST participants.
- Fixed monthly fee for all institutions,
- Additional fee paid monthly for institutions with “domestic revenues” of at least SEK 1 billion, to be divided between these institutions based on their individual “domestic revenues”,
- Fee per payment order sent and
- Fee per sent positive answer to a Recall

Documentation

The Riksbank publicly discloses the following information relating to RIX on the Riksbank’s website:

- A general description of RIX and the underlying settlement services and its operation,
- The governance, organisation and main rules of the Riksbank,
- Terms and Conditions and instructions,
- Participant requirements and participant list,
- Fees,
- The application process for securities to become eligible,
- The list of eligible securities,
- Turnover statistics by month,
- The Annual report of the Riksbank with a report on RIX operations for the previous year.

All disclosed information is available in Swedish and English on the Riksbank’s website.

The latest assessment by the Riksbank according the CPMI IOSCO Disclosure framework for financial market infrastructures was in 2020. The aim is to update the report regularly



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