



The Riksbank's oversight of the financial infrastructure

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The financial infrastructure comprises the systems which handle payments and transactions with financial instruments. An effective financial infrastructure – alongside effective banks, credit markets and financial markets – is crucial to the stability of the financial system. This report describes the role of the Riksbank as an overseer of the financial infrastructure. The report presents the purpose and priorities of this oversight work. The report also describes how oversight work takes place in practice, as well as the means the Riksbank has at its disposal for this work.

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■ Foreword

What is commonly known as financial stability quite simply involves acting in various ways to guarantee a safe and efficient financial system. Private individuals, organisations and authorities, for example, should be able to pay and receive payments safely and efficiently. And when shares, debt securities and other financial instruments are traded on the financial markets, payment and delivery must take place safely and efficiently so that the securities and the payments can change hands. This is made possible by what is known as the financial infrastructure; that is the systems which handle payments and transactions involving financial instruments.

If the financial infrastructure fails to operate, activity in the financial system would more or less grind to a halt: payments and securities transactions could not take place. Hence, the financial infrastructure is a prerequisite for an effective economy.

With its report “The Riksbank’s oversight of the financial infrastructure”, the Riksbank wishes to provide information on why the Riksbank oversees the financial infrastructure, and how. The report also describes some of the challenges the Riksbank is currently facing in its oversight and crisis management work.

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■ Introduction

The Riksbank's financial stability work largely involves acting to ensure that the financial system can continue to provide its basic functions and withstand disruptions that threaten it. The three basic functions of the financial systems are to transfer payments, convert saving into funding and manage risks.¹

Transferring payments means that the financial system assists households and companies when they need to pay for goods or services. In Sweden, it is mainly the banks that provide various kinds of payment services and ensure that payments can be made. Besides the banks, the financial infrastructure – the systems where the actual payments are made – is a prerequisite for the functioning of payment transfers. For transactions with securities, where money and securities are to change hands, there are systems which handle each step of the transaction from the time a customer places a purchase or sale instruction to his or her bank until the transaction is complete. Hence, both healthy banks and a safe financial infrastructure are required for payment transfers to take place in the economy.

The second function is to convert saving into funding. This means that the financial system deals with households' and companies' savings and helps to finance consumption and investments in homes and productive capital, for example. Hence, it helps the people who want to save and the people who want to borrow, although the maturities for these activities may vary widely. For the economy, it is important to be able to convert short-term savings into long-term loans. Here too, the banks and financial markets have a central part to play.

The third function is to manage risks. This means that households and companies, not least banks, have the opportunity to manage their financial risks² by spreading them or redistributing them to the market participants that are interested in taking the risks for a fee. One example of the redistribution of risks is when companies protect themselves against currency risks by buying or selling currency futures. Effective financial markets make it possible to manage risks. For example, banks and companies can insure against interest and currency risks by acting on the international financial markets.

1. Find out more about the Riksbank's financial stability work in the publication "The Riksbank and Financial Stability", 2010.

2. Examples of financial risks include market risks, credit risks, liquidity risks and financing risks.

The Riksbank has determined that in particular banks and the financial infrastructure, like the financial markets in more general terms, are essential to the financial system being able to provide its basic functions. This is why these areas are overseen by the Riksbank. This report discusses the oversight of the systems in the financial infrastructure. The report is structured into three parts:

- the first part explains why oversight of the financial infrastructure is important
- the second part describes how the Riksbank's oversight is conducted in practice
- the third and final part presents the oversight challenges that the Riksbank sees in the period ahead and highlights the fact that this work also extends beyond the systems.

■ 1 Why does the Riksbank oversee the financial infrastructure?

The Riksbank oversees the financial infrastructure in order to identify and analyse sources of risks and efficiency losses in the financial infrastructure, and also acts to reduce these in various ways. The Riksbank has a part to play when there are obvious market failures, that is in situations where the free market does not lead to the optimum utilisation of resources.

Sveriges Riksbank Act

The Riksbank's oversight of the financial infrastructure is based on the Sveriges Riksbank Act (1988:1385) and the responsibility assigned therein for the payments system. According to the Sveriges Riksbank Act, the Riksbank shall promote a safe and efficient payment system.³ This requires a stable financial system so that payments and capital supply can function well. A stable financial system is also a prerequisite for the Riksbank to be able to operate an effective monetary policy – this responsibility is also regulated in the Sveriges Riksbank Act.⁴

Responsibility shared between several Swedish authorities

However, the Riksbank does not bear sole responsibility for promoting financial stability in Sweden; it shares this responsibility with Finansinspektionen (the Swedish Financial Supervisory Authority), the Swedish National Debt Office and the Government through the Ministry of Finance. The cooperation between these authorities is regulated in an agreement which specifies guidelines for consultation and information exchange between the parties in respect of financial stability and crisis management.⁵ This agreement is supplemented by the temporary new council for cooperation on

3. Chap. 1, section 2 of the Sveriges Riksbank Act.

4. According to the Sveriges Riksbank Act, the purpose of the Riksbank's operations is to maintain price stability, Chap. 1, section 2 of the Sveriges Riksbank Act.

5. In February 2003 Finansinspektionen signed an agreement covering cooperation on financial stability issues. In 2005, this agreement was supplemented with guidelines for consultation and information exchange in work with financial stability and crisis management which also includes the Ministry of Finance. In May 2009, the Riksbank, Finansinspektionen, the Ministry of Finance and the Swedish National Debt Office entered into a new agreement, now in force, which also covers the role of the Swedish National Debt Office as a supporting authority in accordance with the Act (2008:814) on State support for credit institutions. See "Memorandum of Understanding between the Government Offices (Ministry of Finance), Sveriges Riksbank, Finansinspektionen and the Swedish National Debt Office regarding cooperation in the fields of financial stability and crisis management", May 2009.

macroprudential policy which will further develop the cooperation of the Riksbank and Finansinspektionen in preventive macroprudential work.^{6,7}

The Riksbank and Finansinspektionen have different roles in the financial stability work and in the work concerning the financial infrastructure. The Riksbank, on the one hand, oversees the financial infrastructure with a view to promoting stability throughout the entire financial system. Finansinspektionen, on the other hand, is responsible for the supervision of companies in the financial infrastructure and grants authorisation to operate in areas such as clearing and settlement with the support of Swedish law. There are elements of the financial infrastructure which are covered by the oversight and supervisory work of both the Riksbank and Finansinspektionen, which means that the responsibilities of the two authorities sometimes overlap. In such cases, both authorities attempt to develop efficient forms of contact and collaboration.

What is the financial infrastructure, and why is it important?

The Riksbank defines the financial infrastructure as the systems which handle financial positions and/or process financial flows between various participants, their legal frameworks and procedures, and the participants' use of these systems. In simple terms, the financial infrastructure comprises the systems where payments are made and transactions involving financial instruments are handled.

An effective financial infrastructure is crucial for a stable financial system. Weaknesses in the infrastructure could lead to disruptions spreading throughout the entire system, resulting in major socioeconomic costs. The risk of this kind of spreading of disruptions is usually known as systemic risk. These disruptions may affect a participant or a system and spread to other participants and systems, hence potentially affecting the functioning of both the payment market and the financial markets.

Purpose of overseeing the financial infrastructure

The Riksbank oversees the financial infrastructure in order to execute its statutory mandate to promote a safe and efficient payment system. More specifically, oversight aims to identify and analyse sources of systemic risks

6. The council consists up of the Riksbank and Finansinspektionen and meets twice a year. Its members are the Governor of the Riksbank, the Director General of Finansinspektionen, a Deputy Governor of the Riksbank, the Head of the Riksbank's Financial Stability Department and the Chief Economist and Chief Legal Counsel of Finansinspektionen.

7. Macroprudential policy involves reducing risks for the financial system as a whole. The authorities responsible for macroprudential policy influence and are influenced by other policy areas such as monetary policy, microprudential policy and financial policy. Therefore, there must be good forms for close coordination and information exchange in these fields.

and efficiency losses in the financial infrastructure, and also acts to reduce these in various ways.

There is no unique definition that describes what oversight of the financial infrastructure means. The Riksbank interprets its mandate as follows:

The oversight of systems in the financial infrastructure is a function of the Riksbank which aims to promote the overall goal of safety and efficiency in the payments system by monitoring existing and planned systems, assessing these on the basis of applicable principles and, if necessary, bringing about change.

In concrete terms, oversight involves monitoring and analysing the financial infrastructure and any changes to it. The Riksbank also analyses areas which are closely interlinked with the financial infrastructure and which are important to its function, efficiency and stability. One example of an area of this kind is the use of various payment instruments and their link to efficiency and stability in the payment market. Another example is the handling of the transactions which take place outside the systems.

Occurrence of market failures

The Riksbank's oversight work is based on the assumption that the market itself should be able to create safe and efficient systems without the involvement of the authorities. However, sometimes market failures do occur – that is situations in which the free market does not lead to the optimum use of resources – and the authorities have a job to do in this case. Market failures can occur on markets where there is asymmetrical information⁸, public goods, monopolies, cartels and external effects, for instance.⁹ Market failures can lead to systemic risks, which in turn can have enormous socioeconomic consequences.

One example of a potential market failure is insufficient investments in risk-reducing measures. This can lead to excessively high risks. Systemic risks which can threaten financial stability are particularly important and serious. Reduced risks are what are known as a public good as everyone benefits from this at no extra cost. However, the provider of this infrastructure does not necessarily take full account of this external effect since it does not generate corresponding revenue streams. If the provider decides to invest on the basis of the value of its own enhanced safety – without regarding the additional benefit to others – the investment will be too small. As a

8. Asymmetrical information means that parties entering into an agreement with one another have access to different prior information.

9. An external effect occurs if an economic transaction affects a third party.

result, the system will not be as safe as it could be. Insufficient investments in risk-reducing measures can also occur when two or more systems are competing with one another, resulting in what is referred to as a race to the bottom.

Another example of a potential market failure is insufficient investments in innovations. Competition affects the infrastructure's chances of charging for its services, and hence also the chances of building a functioning business model around innovations. For example, a monopolist competes against itself if it launches products which compete with one another, and this can weaken the incentive to invest in innovations.

It is not self-evident that market failures *per se* are reason enough for the authorities to intervene. This can distort the incentives for the systems and the market participants. If, for example, these parties know in advance that the authorities want to prevent system collapse at any price, they can take greater risks than they would otherwise have done, which in itself undermines the safety of the financial system.¹⁰ But if the market fails to come up with the best solutions itself from a socioeconomic standpoint, authorities – such as a central bank – may need to intervene.

The Riksbank's oversight essentially focuses on crisis prevention

In its financial stability work, the Riksbank differentiates between crisis prevention work and crisis management.¹¹ Overseeing the financial infrastructure essentially forms part of preventive work and so is proactive in nature. The Riksbank works constantly to influence laws, rules and the systems' risk management and efficiency in a direction which minimises the vulnerability of the financial system.

If a crisis nevertheless occurs, the Riksbank has contingency measures in place to manage it, but there are few opportunities to act operationally within the financial infrastructure.^{12, 13} Rather, the role of the Riksbank is to give advice, which assumes a good knowledge of the systems in the financial infrastructure. By analysing how disruptions in systems or their participants affect different parts of the financial infrastructure, the Riksbank understands – for example – how these disruptions could spread to other parts

10. Known as a moral hazard.

11. Find out more about the Riksbank and financial stability in a crisis on pp. 21–24, "The Riksbank and Financial Stability", 2010.

12. The Riksbank owns and operates the RIX system and so acts operationally both in normal circumstances and in crises. The RIX system is operated and overseen at two different departments at the Riksbank which are separate from one another.

13. In the event of a crisis, the Riksbank acts as what is known as a lender of last resort, which means that the Riksbank can provide liquidity assistance in accordance with Chapter 6, section 8 of the Sveriges Riksbank Act.

of the financial market. More information on the tasks of the oversight function in crisis management is presented in the section entitled “Preparations for crisis management” in the third part of this report.

How do safety and efficiency relate to one another?

The statutory mandate to promote a safe and efficient payments system means that the Riksbank has two goals for its oversight of the financial infrastructure. Thus the Riksbank must take into account both safety and efficiency in the systems.

The Riksbank’s analysis of a system may then indicate that increasing efficiency may impair the safety of the system and eventually lead to shortcomings in the wider financial system. The reverse may also apply; increased safety may lead to lower efficiency and eventually to more expensive financial services.

If a conflict arises between the two goals, the Riksbank generally prioritises safety over efficiency, but in practice trade-offs may need to be made. A situation could arise where the Riksbank may actually have a reason to promote an improvement in efficiency, even though this would involve certain adverse effects for safety in the system. The reason may be that a system that has made a lot of progress in its safety work will achieve a major increase in efficiency which creates greater safety in the long term, but poorer safety in the short term. In this case, the Riksbank could promote an efficiency improvement of this kind, but in its assessment it would describe the short-term adverse effects and discuss the trade-offs made.

■ 2 How does the Riksbank operate in practical terms to oversee the financial infrastructure?

The Riksbank expects the systems in the financial infrastructure to comply with the international principles prepared by CPSS-IOSCO.^{14, 15, 16} The oversight work aims to ensure this. Monitoring takes place in that the systems assess themselves, and also in that the Riksbank carries out an in-depth analysis of specific risks in the system. If the analysis indicates shortcomings in safety or efficiency in a system, the Riksbank encourages the system to rectify them.

Criteria for definition of which systems are to be included in oversight

The Riksbank applies six criteria for identifying the systems to be overseen:

- the number of transactions and the values of the transactions processed by the system
- the system's market shares
- the markets on which the system is active
- available alternatives which can be used in the short term
- connections with other systems and other financial institutions
- the system's significance for the implementation of monetary policy.

As soon as the Riksbank has decided to oversee a new system, the decision is announced.

14. CPSS, the Committee on Payment and Settlement Systems, is an international committee under BIS, Bank for International Settlements. In CPSS, central banks oversee and analyse the development of clearing and settlement systems, among other things.

15. IOSCO, the International Organization of Securities Commissions, is an international federation of organisations which regulate the world's securities markets.

16. BIS (2012), "CPSS-IOSCO Principles for Financial Market Infrastructures" is available at www.bis.org and at www.riksbank.se.

The Riksbank currently oversees the following systems in the financial infrastructure:

- RIX, the Swedish system for the settlement of large-value payments
- Euroclear Sweden AB¹⁷, the Swedish central securities depository, which offers securities settlement services
- NASDAQ OMX Derivatives Markets, in its role as a central counterparty for derivative instruments and repos¹⁸
- Bankgirocentralen BGC AB (Bankgirot), a payment system for different types of account transfers¹⁹ in Sweden
- The foreign systems²⁰ CLS²¹, EMCF²² and SWIFT.²³

In the view of the Riksbank, it is important to have a safe and efficient system for the large value payments that banks and clearing organisations settle between themselves. RIX is such a system which by definition handles large values as all payments in Swedish kronor end up there sooner or later.²⁴ RIX has a daily turnover which is equivalent to a sixth of the Swedish annual gross national product, and forms the hub of the Swedish financial infrastructure.

The Riksbank also believes that it is important for the functioning of the market that securities transactions can be handled without disruption. In this context, Euroclear Sweden has an important part to play in financial stability as it handles all securities settlements in Sweden and hence has links with and is dependent on other participants and systems in the financial infrastructure. The Riksbank is also of the opinion that the central counterparty NASDAQ OMX has major contagion risks. It settles relatively low values of derivative instruments and repos in RIX and Euroclear Sweden, but at the same time it concentrates counterparty risks into a single system.

17. Euroclear Sweden AB is a Swedish subsidiary of Euroclear Group. The Riksbank participates in an arrangement for cooperative oversight of the Euroclear Group which is headed by the central bank of Belgium.

18. Repos is an abbreviation of repurchase agreements.

19. These account transfers are sometimes referred to as retail payments.

20. The Riksbank participates in established cooperative oversight arrangement for these foreign systems.

21. CLS, Continuous Linked Settlement, is a system for the settlement of currency transactions. Oversight is conducted under the management of Federal Reserve Bank New York.

22. EMCF, European Multilateral Clearing Facility, is a central counterparty for certain share transactions on – among others – NASDAQ OMX Nordic Exchanges, Burgundy and for certain European trading venues. Oversight is conducted under the management of the Dutch authorities.

23. SWIFT, Society for Worldwide Interbank Financial Telecommunication, is a system which executes payment messages for the world's participants in the financial system. Oversight is conducted under the management of the central bank of Belgium.

24. The RIX payment system is the Riksbank's system for account transfers. This is the hub of the Swedish financial system as it gives participants – banks, clearing houses and several other market participants – the opportunity to make financial transfers in a manner which involves no credit or liquidity risks. More or less all payments in Swedish kronor which do not take place internally within a single bank are handled in some form via RIX.

There would be major socioeconomic costs if private individuals were unable to make their payments. However, private individuals would have difficulty finding substitutes for the account-based payments, known as retail payment, which they use every day. This is why the Riksbank monitors Bankgirot, which is a system for retail payment, even though the transactions in the system are not of large value.

Analysis based on international principles

When overseeing the financial infrastructure, the Riksbank applies the international principles for stability and efficiency drawn-up by CPSS, the Committee on Payment and Settlement Systems, and IOSCO, the International Organization of Securities Commissions. These principles aim to reinforce the financial infrastructure.

However, these principles are minimum requirements, and specific special features of the Swedish market may mean that the Riksbank has to set more stringent requirements. When the Riksbank adapts the requirements to Swedish conditions, this is justified in the analysis and assessment of individual systems. If the systems comply with the international principles but not the Riksbank's more stringent requirements, the Riksbank provides notification of this in its assessment of the systems.²⁵

Besides the international principles, the Riksbank takes into account applicable laws and sometimes also "best practice" on the market in its analysis. In these cases too, the Riksbank's assessment includes information on which laws or other factors are involved and why they are used in the analysis.

The systems assess themselves on the basis of the international principles

The systems are assessed on the basis of the international principles at least every three years, or more often if the Riksbank is of the view that there is reason to do so; if the system has undergone major changes, for example. The systems carry out the assessment themselves in the form of self-assessments. These self-assessments are used by the Riksbank as a basis for its own assessment of the systems.

To complement this, the Riksbank carries out an in-depth analysis of specific risks in the systems (see the next section). When the analysis – both the self-assessments with associated assessment by the Riksbank and the in-depth analysis – is complete, the Riksbank judges whether there are sources of systemic risks or efficiency losses.

25. Find out more about analysis and assessment in the sections entitled "Oversight involves three stages" and "Communication of shortcomings in the systems".

The Riksbank prioritises risks in and between the systems

The Riksbank prioritises risks in and between the Swedish systems in the financial infrastructure. For every system, the risks are assessed on the basis of how likely they are to materialise and also of the extent of the consequences for financial stability in Sweden. The Riksbank then prepares a plan for oversight activities that indicates which risks are to be given priority – that is to say, analysed further and managed in the short term – and less acute risks that can be managed in the longer term.

Risks may also occur over the year as a consequence of a change in the system or in the business sector within which the system operates. In this instance, the Riksbank first analyses what the actual change involves and then applies the risk-based working method described above, and then re-prioritises the identified risks if necessary.

Oversight comprises three stages

The Riksbank's ongoing oversight can be divided into three stages:

The first stage involves collecting both qualitative and quantitative information on the systems concerned. The Riksbank has a statutory right to acquire information from the systems which the Riksbank considers necessary in order to oversee the stability of the payment system.²⁶ Therefore, the systems are expected to notify the Riksbank of planned changes to the systems and of other important factors which affect them. Such information may, for example, include existing documentation which is submitted to the Riksbank at quarterly meetings with representatives of the systems. The Riksbank also monitors statistics and information circulated between the meetings and can also acquire information on the systems by collecting the views of their participants.

The second stage involves analysing the information and identifying sources of systemic risks and efficiency losses. This stage involves analysis and assessment of the systems' self-assessments and in-depth analysis of specific risks in the systems.

The third stage involves encouraging the systems to rectify any shortcomings in safety or efficiency.

Besides these three stages, oversight also includes facilitating and promoting market initiatives which may develop and make the financial infrastructure more efficient. In this regard, the Riksbank can provide advice and facilitate cooperation in the network within the financial infrastructure between both private players and authorities.

26. Chap. 6, section 9 of the Sveriges Riksbank Act.

Communication on shortcomings in the systems

If the Riksbank's analysis indicates shortcomings in safety or efficiency, the Riksbank encourages the system to rectify these. However, the Riksbank is unable to issue regulations or introduce sanctions in order to demand that the systems undertake measures if shortcomings are discovered. Instead, the Riksbank uses what is known as moral suasion, which means that the Riksbank communicates its view publicly and directly to the systems, gives reasons for this, and expects the systems to adapt to it. This work involves public statements, speeches and publications, as well as discussions and meetings with the systems. If a shortcoming has been identified in a system and should be rectified, the Riksbank in its Financial Stability Report can issue recommendations to the system and its participants.²⁷ The Executive Board of the Riksbank decides on such recommendations. Another way of communicating a shortcoming in a system is to discuss it at the temporary council for cooperation on macroprudential policy.

It is important to point out that the Riksbank's oversight in no way absolves the individual system of responsibility for its own risk management. Ultimate responsibility for ensuring that operations are safe and efficient always rests with the system itself.

Cooperation on the oversight of foreign systems

Stability in the Swedish financial infrastructure may depend in part on the safety and efficiency of a foreign system. Therefore, the Riksbank collaborates on the oversight of foreign systems that are active in Sweden but that have their legal domicile abroad. Cooperative oversight arrangements are established between the relevant authorities for the foreign systems active in the Swedish infrastructure; CLS, EMCF and SWIFT. This oversight is managed by the relevant authorities in the home countries of the respective systems and complies with the guidelines for collaboration in accordance with the international principles from CPSS-IOSCO.

The Riksbank also participates in international working groups within the Bank for International Settlements (BIS) and the European Central Bank (ECB) with a view to reinforcing the financial infrastructure in various ways. This may involve working groups for more in-depth analysis of certain risk areas or submarkets, or following up market participants' management of various types of risk, conducting surveys of various kinds, and so on.

27. The "Financial Stability Report" is published twice a year and includes the Riksbank's analysis and assessments of stability in the Swedish financial system.

■ 3 Challenges in the Riksbank's oversight and crisis management work

The financial system is constantly changing. In the case of the infrastructure this involves, for example, the introduction of new technology and new regulatory frameworks which establish new possibilities and rules. It also involves the creation of new financial instruments, participants, marketplaces and payment methods which affect the financial infrastructure in various ways. All of this places new requirements on the Riksbank's oversight work. In addition, there are lessons to be learned from the financial crisis that affected Sweden in 2008; for instance, the fact that a lack of liquidity was one of the most important channels for the spread of disruption throughout the financial system.

Against this background, the content and priorities of the Riksbank's oversight work and preparations for managing crises have altered. The Riksbank perceives a need to develop appropriate working methods and to reinforce both knowledge and expertise within three areas in particular:

- understanding the risks throughout the entire transaction and understanding how these risks will be affected if changes are made
- understanding what requirements and risks are involved for the financial infrastructure in the event of internationalisation, as well as the new requirements this places on the Riksbank as an overseer of the financial infrastructure
- being well prepared to manage a crisis and "pinpointing" the largest risks in advance.

Risks throughout the entire transaction chain

During the most acute phase of the financial crisis in the autumn of 2008, the financial infrastructure both in Sweden and elsewhere worked well.²⁸ The problems which arose in connection with the bankruptcy of Lehman Brothers occurred mainly in and with the transaction flows that were taking place outside of what we define as the financial infrastructure. One important conclusion that can be drawn from this is that it is desirable for the Riksbank to be able, as far as possible, to identify risks even when they are outside the systems in the financial infrastructure.

²⁸. See Sveriges Riksbank, Financial Stability Report 2009:1.

To fully understand various types of risk, the Riksbank needs to be aware of the structure of the entire chain for a financial transaction; from the time a payment or the purchase or sale of a financial instrument is initiated until the actual settlement. Therefore, the Riksbank monitors and analyses developments in the market places for trading in various financial instruments, the occurrence of electronic trading, the regulations on these market places (such as MiFID²⁹ and MiFIR³⁰) and the conditions which allow various phenomena to exist on various markets (such as high-frequency trading, HFT³¹). But as certain financial instruments are traded outside established market places, that is OTC³², knowledge of how the risks involved in trading such instruments are managed is also required. In this case, the parties – for example in foreign-exchange trading – make transactions amongst themselves, often by virtue of agreements that aim to ensure that both parties keep their part of the deal until the final settlement.

The systems in the financial infrastructure perform an important function and form part of the chain after a payment or the purchase or sale of a financial instrument has been initiated. The purpose of these systems is to manage risks in clearing and settlement, for example by applying P v P (payment versus payment) and D v P (delivery versus payment) principles, which have been formulated in order to eliminate settlement risk.

As far as the Riksbank is concerned, this involves surveying and understanding the structure of the flows as far as possible – what types of participants are involved and what risks and problems may be encountered in these flows – on the basis of the Riksbank's perspective as an overseer of financial stability. Banks are central participants in the Riksbank's oversight work. Therefore, the Riksbank analyses banks and other financial participants in order to understand the risks throughout the entire financial system and the risks which the banks may pose to the financial infrastructure.

If risks and problems are identified outside the systems in the financial infrastructure, it is also important to disclose information on these in order to build up a broad understanding of how these risks can be managed. The Riksbank can do this by highlighting surveys and any risks identified in its reports or in other public contexts.

Besides having knowledge of the structure of the entire transaction chain, the Riksbank needs a deep insight into how the financial markets and payment markets work, i.e. the functionality of the markets. The Riksbank has an interest in ensuring that the financial markets work well. The fixed income and foreign-exchange markets are of particular significance as

29. MiFID is an abbreviation of the EU's Markets in Financial Instruments Directive.

30. MiFIR is an abbreviation of the EU's future Markets in Financial Instruments Regulation.

31. HFT is an abbreviation of High-Frequency Trading.

32. OTC is an abbreviation of Over the Counter.

these are important both to the Riksbank's ability to implement monetary policy and to the banks' financing and risk management, and hence to the Riksbank's possibilities to promote financial stability. The objective is to understand how the various financial markets work in order to identify any risks and problems that may be inherent in their functions.

One of the lessons of the financial crisis in 2008 was that certain parts of the financial markets were affected by the fact that participants were unwilling to accept counterparty risk. This led to a sharp reduction in liquidity in the market, and as a consequence there was a substantial increase in the difference between purchase and selling prices. In some cases liquidity disappeared completely, which meant that there was no market for the securities at all. This completely derailed the functioning of markets. One interesting issue in this regard is whether there is any solution that could reinforce the market in such a situation. The Riksbank is carrying out in-depth analyses of the importance of various phenomena (such as algorithmic trading and high-frequency trading) and how various markets and submarkets function, and is discussing various ways of improving efficiency and safety in a normal situation; along with possible solutions for increasing the resilience of the market in a crisis.

As regards the functionality of the payment market, the Riksbank is interested in monitoring efficiency and the risks associated with various types of payment. The Riksbank sometimes carries out targeted special studies of the efficiency of various submarkets. One example is the study implemented by the Riksbank on the socioeconomic costs of consumers' payments for various types of payment instrument.³³ The purpose of these efficiency analyses is to understand how well the Swedish market is meeting customers' requirements by offering services which they demand, what scope the market has for adopting innovations, and what costs end customers face for making payments. The Riksbank also has a particular interest in monitoring the efficiency of RIX, the system for large-value payments, as the Riksbank itself operates this system.

One way in which the Riksbank can create a broader understanding of where the risks are and the structure of these risks is to enter into dialogue with market participants. This is why the Riksbank meets market participants in order to learn more about their actions and risk management. Other methods may include carrying out market surveys or reviewing the analyses in this field done by authorities and central banks.

33. Bergman, Mats, Guibourg, Gabriela and Segendorf, Björn (2008), "Card and cash payments from a social perspective", Sveriges Riksbank Economic Review 2008:2, Sveriges Riksbank

Internationalisation means new risks in the systems and places new requirements on the Riksbank in its capacity as an overseer

Many participants in the financial system are operating across borders to an increasing extent, and their customers may be both foreign and domestic. This previously applied mostly to banks, but is increasingly the case for financial infrastructure as well. Payments and securities transactions initiated by Swedish participants are now being handled to a greater extent by foreign systems or foreign-owned systems compared with a decade ago.³⁴

Internationalisation may involve new risks for the systems in the financial infrastructure, for example risks relating to governance. The organisation of groups in the financial infrastructure is tending to become more complex as a consequence of mergers and acquisitions. Maintaining adequate risk control becomes even more difficult when the systems outsource parts of their business.

As far as the Riksbank is concerned, internationalisation places new demands on both oversight and work to prepare for crises. Assessing ever more complex organisational structures and assessing whether the systems' risk control is adequate are challenges that must be faced in the field of oversight. In addition, both oversight and crisis preparation work – as a consequence of the systems operating across borders – have to be based to a greater extent on cooperation with other central banks and authorities. As a basis for each such cooperation, an agreement is drawn up in the form of what is known as a memorandum of understanding (MoU).³⁵ These agreements regulate areas such as the exchange of information between the authorities concerned. The international principles for the financial infrastructure published by CPSS-IOSCO include guidelines relating to cooperation among authorities. The Riksbank applies these principles when cooperating with other authorities.

One relevant question in this context is whether it matters whether foreign systems handle payments and securities transactions in Sweden. The Riksbank's view is that it does not matter where a system in the financial infrastructure is located, as long as payments and securities transactions can be executed safely and efficiently. However, in the event of a financial crisis, it is important that the Riksbank is able to act in order to promote the stability of the Swedish payments system, regardless of whether the systems are Swedish or foreign. In this regard, the Riksbank deems there is a need for more formalised cooperation with foreign authorities.

34. Such a system may be operated by a Swedish subsidiary to a foreign parent group, or a foreign system operating within the Swedish financial system. As stated previously, the foreign systems operating within the Swedish financial infrastructure are CLS, EMCF and SWIFT. Euroclear Sweden AB is a subsidiary of Euroclear plc in Belgium (the parent company of the Euroclear group), and Nasdaq OMX AB is a subsidiary of the American Nasdaq OMX Group.

35. An MoU is a declaration of intent, not a legal undertaking.

Preparations for managing crises

One important task for the Riksbank's oversight of the financial infrastructure is to be prepared through its analysis work to manage a crisis. One challenge involves being able to "pinpoint" the largest risks in each system in advance and to analyse the potential consequences for the financial system if such a risk were to materialise.

Above all, there are two areas that are highly relevant to crisis work. One is to work on the basis of analysis to assess how various types of disruption in infrastructure could affect the financial flows, and to what extent. The other is to use analysis to gain knowledge of how participants in the financial system – the banks, central counterparties (CCPs) and other financial participants – handle their short-term payment flows. The Riksbank's analysis needs to answer certain specific questions, such as how participants' problems can spread through the financial system, how they will affect the financial infrastructure, how various disruptions in infrastructure can affect the progress of a crisis and how participants can manage their liquidity during the day.

Requirements concerning liquidity and liquidity management have become significantly more stringent since the financial crisis. One reason for this is that the participants in the financial system have become increasingly integrated. During the financial crisis, the shortage of liquidity was one of the most important channels for the spread of disruption throughout the financial system. Liquidity is what lubricates the financial infrastructure and the financial system. This is why understanding banks', CCPs' and other financial participants' needs and planning for short-term payment flows is an essential ingredient of the Riksbank's oversight. This understanding is important even in times of crisis as the Riksbank may need to grant credit or guarantees with a view to supporting liquidity if there are particular reasons for doing so.³⁶

The Riksbank also sees two further areas that need to be developed. One of these involves developing procedures for recovery plans, winding-down plans and resolution plans for the financial infrastructure; that is to say, plans relating to how the systems can be managed after a bankruptcy with minimal disruption on the financial markets and in the payment system in general.³⁷ Such plans are particularly important to CCPs, which take counterparty risks in their operations that have to be managed even if a CCP were to be declared bankrupt. The other area involves analysing and assessing how various crisis scenarios could affect the systems in the financial infrastructure in order to plan what measures the Riksbank could undertake in a crisis situation. One example of a measure of this kind is the option of providing liquidity assistance to a CCP.

³⁶ Chap. 6, section 8 of the Sveriges Riksbank Act.

³⁷ Financial Stability Forum, "FSF Principles for Cross-border Cooperation on Crisis Management", April 2009.

■ Conclusion

The aim of the Riksbank's oversight of the financial infrastructure is to identify and analyse sources of risks and efficiency losses and to act in various ways to reduce these. In the opinion of the Riksbank, there are two main areas of oversight that are essential in order to achieve this aim and that can be constantly improved:

- to prioritise risks in and between the systems so that resources are invested in the risks deemed to be the greatest
- to clearly communicate the results of oversight work to both the systems and the general public.

The Riksbank has long applied a risk-based working method, and this has been formalised over the past year. The major challenge here is to apply the working method as correctly as possible so that the right priorities are set within and between the Swedish systems in the financial infrastructure.

As regards the communication of any shortcomings in the systems, the Riksbank intends to publish an annual report from 2013 onwards. The intention is for the report to provide a general description of the Riksbank's oversight operations and the main results of its oversight work during the year.

■ Relevant Riksbank publications

Andersson, Martin, Gabriela Guibourg and Björn Segendorff (2001), The Riksbank's oversight of the financial infrastructure, *Sveriges Riksbank Economic Review* 2001:3, Sveriges Riksbank

Bergman, Mats, Guibourg, Gabriela and Segendorf, Björn (2008), Card and cash payments from a social perspective, *Sveriges Riksbank Economic Review* 2008:2, Sveriges Riksbank

Memorandum of Understanding between the Government Offices (Ministry of Finance), Sveriges Riksbank, Finansinspektionen and the Swedish National Debt Office regarding cooperation in the fields of financial stability and crisis management, May 2009

Sveriges Riksbank Act (1988:1385)

Sveriges Riksbank (2010), *The Riksbank and Financial Stability*

Sveriges Riksbank (2001), CLS Bank – improved risk management in the foreign exchange market, *Financial Stability Report* 2001:2

Sveriges Riksbank (2009), *Financial Stability Report* 2009:1



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