

**Payment, clearing and
settlement systems in
Sweden**

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List of abbreviations

ACH	automated clearing house
ATM	automated teller machine
BGC	Bankgirocentralen BGC AB
CDS	credit default swap
CLS	Continuous Linked Settlement
CCP	central counterparty
CSD	central securities depository
DKK	Danish krone
DVP	delivery versus payment
EEA	European Economic Area
EMCF	European Multilateral Clearing Facility N.V
ERP system	Enterprise Resource Planning system
ESCB	European System of Central Banks
EU	European Union
EUR	Euro
IR TRR	Interest Rate Trade Reporting Repository
LOM	liquidity optimisation mechanism
MiFID	Markets in Financial Instruments Directive
NASDAQ OMX DM	NASDAQ OMX Derivatives Markets
NOK	Norwegian krone
OTC	over the counter
PNC	PAN Nordic Card Association
POS	point of sale
RIX	Riksbank funds transfer system
RTGS	real-time gross settlement
RTM	real-time settlement mechanism
SCP	Scandinavian Cash Pool
SEK	Swedish krona
SEPA	Single Euro Payments Area
SIA-SSB	Società Interbancaria per l'Automazione – Società per i Servizi Bancari
SSDA	Swedish Securities Dealers Association
SSS	securities settlement system
STP	straight through processing
USD	US dollar

Introduction

Sveriges Riksbank is the Swedish central bank. According to the Sveriges Riksbank Act (*Lagen om Sveriges riksbank, 1988:1385*), the Riksbank is responsible for promoting a safe and efficient payment system.¹ To this end, the Riksbank oversees the payment, clearing and settlement systems, provides for the stability of the financial system and ensures the supply of banknotes and coins. In the Swedish payment system, the Riksbank has both an oversight role and an operational role. The Financial Stability Department is responsible for the oversight role, while the Asset Management Department performs the operational functions.

Finansinspektionen is the Swedish financial supervisory authority and is responsible for the supervision of companies operating in the credit, insurance and securities markets, including the supervision of all clearing organisations. The Ministry of Finance is the Swedish government office responsible for, inter alia, the drafting of legislation regulating the financial sector.

The Riksbank owns and runs the funds transfer system, which is known as RIX. RIX started operating in 1990. In 2009 the technical system and the technical platform were replaced with a new system from the Italian firm Società Interbancaria per l'Automazione – Società per i Servizi Bancari (SIA-SSB).

The Swedish central securities depository (CSD), Euroclear Sweden, operates the securities settlement system (SSS). Equities, bonds and money market instruments are all dematerialised within an in-house-developed system.

NASDAQ OMX runs the Swedish stock exchange, the derivatives exchange and the electronic inter-dealer exchange for certain government bonds. This same entity acts as the central counterparty (CCP) for derivatives and repo transactions. A new CCP, the European Multilateral Clearing Facility (EMCF), was introduced in the Swedish equity market in 2009. EMCF acts as a CCP in the clearing of cash equity transactions on the NASDAQ OMX exchanges in Stockholm, Copenhagen and Helsinki and on some other multilateral trading platforms operating in the Nordic countries.

There is one major retail payment system in Sweden. Bankgirocentralen BGC AB (BGC) offers automated clearing house (ACH) services with settlements occurring on participants' accounts in RIX.

In terms of transaction volumes, retail payments in Sweden are dominated by card transactions. Usually, cards issued in Sweden are connected to one of the international systems, Visa or MasterCard. However, in terms of transaction value, credit transfers and direct debits together account for the vast majority of all non-cash transactions while card transactions only account for a minor part. Nearly all credit transfers and direct debits are initiated electronically. The value and the number of cheque transactions, money orders or other paper-based credit and debit payment instruments are very low.

¹ The Swedish term "Betalningssystem" (typically translated as "payment system") here refers to the payment system in a broad sense and not to a particular payment or settlement system.

1. Institutional aspects

1.1 The general institutional framework

As Sweden's central bank, the Riksbank is an authority that reports to the Riksdag, the Swedish parliament. The Riksbank is responsible for monetary policy with the aim of maintaining price stability. The Riksbank is also mandated to promote a safe and efficient payment system (see Section 1.2). Additionally, the Riksbank issues banknotes and coins and manages the reserves of gold and foreign currencies.

Finansinspektionen is the Swedish financial supervisory authority. Finansinspektionen supervises companies in the credit, insurance and securities markets, including all clearing organisations.

The Ministry of Finance is the Swedish government office responsible for, inter alia, drafting legislation regulating the financial sector (credit institutions, securities firms, funds management, stock exchanges, clearing houses and insurance companies).

The principal laws forming the legal framework for the payment and settlement systems infrastructure in Sweden are listed and briefly described below:²

- The Sveriges Riksbank Act (*Lagen om Sveriges riksbank, 1988:1385*) 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 has the obligation, on the Riksbank's request, to provide it with such information as the Riksbank considers necessary in order to fulfil its task of promoting a safe and efficient payment system.
- The Payment Services Act³ (*Betaltjänstdirektivet, 2007/64/EG*) aims to harmonise legislation on payments in the EU/EEA and also to strengthen consumer protection in connection with payments in euros (EUR) and the currencies of member states outside the euro area. It also represents a step towards the harmonisation of the payment market that the Single Euro Payments Area (SEPA) aims to achieve. The directive regulates, among other things, the right of direct debit payers to request repayment of incorrectly executed direct debits. It also provides guidelines on the responsibilities of banks and consumers in cases where an unauthorised transaction has occurred, for example, in connection with some forms of payment card fraud. In addition, an entirely new category of payment institution has been introduced which is entitled to mediate payments, but also to provide credit in connection with the payment service.
- The Settlement Systems Act on systems for settlement of obligations on the financial market (*Lagen om system för avveckling av förpliktelser på finansmarknaden, 1999:1309*) is based on the EC Directive on settlement finality in payment and securities settlement systems (Settlement Finality Directive).⁴ It

² Other relevant laws are briefly described in *The Swedish Financial Market 2010*, which can be downloaded from the Riksbank website www.riksbank.se.

³ The act transposes Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC.

⁴ Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems.

governs the registration and approval of systems used for clearing and settling transactions with financial instruments and aims to reduce risk associated with participation in such systems.

- The Securities Market Act (*Lagen om värdepappersmarknaden, 2007:528*) contains provisions on investment services, marketplaces for securities trading and clearing and settlement of securities trading. This Act is based on the Markets in Financial Instruments Directive (MiFID).⁵
- The Financial Instruments Accounts Act (*Lagen om kontoföring av finansiella instrument, 1998:1479*) regulates the registration of ownership of both dematerialised financial instruments and those material instruments that 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 (*Lagen om handel med finansiella instrument, 1991:980*) specifies the disclosures to be made, the information to be provided and the procedures to be followed when transactions with financial instruments are undertaken. It also lays down a netting provision regarding contracts involving financial instruments. The Act is based, inter alia, on the EU Prospectus Directive.⁶
- The Act on Fees on some Cross-Border Payments (*Lag om avgifter för vissa gränsöverskridande betalningar, 2002:598*) extends to payments made in Swedish kronor (SEK) the provisions on charges for cross-border payments in the EC regulation on cross-border payments in the Community.⁷

The Swedish banking sector is highly concentrated, with the four largest commercial banks (SEB, Handelsbanken, Nordea and Swedbank)⁸ accounting for almost three quarters of household lending, 72% of corporate lending and an even higher proportion of payment activities in the end of September 2010. Foreign banks are allowed to operate in Sweden through branches as well as through subsidiaries. Some 27 foreign banks are represented in the Swedish market, almost all through branches.

1.2 The role of the central bank

The Riksbank's responsibilities in respect to the payments system and its various components are formulated in very general terms in the Sveriges Riksbank Act. The act mandates the Riksbank to promote a safe and efficient payment system, which has been interpreted as a general responsibility for looking after the stability of the Swedish financial system. The importance of safe and efficient financial market infrastructures to these objectives predicate the Riksbank's role as an overseer of the payments system (see *Oversight* below).

⁵ Directive 2004/39/EC of the European Parliament and of the Council of 21 April 2004 on markets in financial instruments amending Council Directives 85/611/EEC and 93/6/EEC and Directive 2000/12/EC of the European Parliament and of the Council and repealing Council Directive 93/22/EEC.

⁶ Directive 2003/71/EC of the European Parliament and of the Council of 4 November 2003 on the prospectus to be published when securities are offered to the public or admitted to trading and amending Directive 2001/34/EC.

⁷ Regulation (EC) No 924/2009 of the European Parliament and of the Council of 16 September 2009 on cross-border payments in the Community and repealing Regulation (EC) No 2560/2001.

⁸ The banks' mortgage institutions and finance companies are included in these figures.

The Riksbank Act also states (see Section 1.1) that the Riksbank may make available systems for settlement of payments and in other ways participate in the settlement of payments. The Riksbank runs the RIX funds transfer system (see *The provision of an interbank settlement system* below).

Oversight

The Riksbank's oversight of the financial infrastructure covers instruments of payment and technical and administrative systems that enable flows of financial assets between different institutions and marketplaces.

The primary objective of the Riksbank with regard to the payment system – as both overseer and operator – is to identify, manage and limit systemic risks. These risks arise primarily in connection with the transfer of large-value payments between banks and other financial institutions. Therefore, from a financial stability perspective, the interest and activities of the Riksbank are concentrated on this aspect of the payment system. As a consequence, its oversight is focused on systemically important payment systems,⁹ ie RIX, Euroclear Sweden and NASDAQ OMX Derivatives Markets (NASDAQ OMX DM).

Retail payment systems are also included in the Riksbank's oversight responsibilities as there are currently no alternative systems and they are considered systemically important. In the field of retail payments, the Riksbank also considers questions of efficiency with a view to encouraging the adoption of efficient payment solutions.

In performing its oversight role, the Riksbank regularly meets with representatives of various interests in the Swedish payments system. The Riksbank can propose new laws and amendments directly to the parliament and it is also required to comment on new laws and various official reports. In addition to these activities, the Riksbank takes part in the public debate on issues relating to financial market infrastructure. Also, the Riksbank makes yearly assessments of systems designated as systemically important.¹⁰ As transparency is fundamental to the Riksbank's primary oversight tool of moral suasion, a key element of its oversight activities is the publication of its annual infrastructure assessments and semiannual Financial Stability Report.

This oversight and the annual assessments of BGC, NASDAQ OMX DM and Euroclear Sweden are conducted in cooperation with Finansinspektionen (see Section 1.3) and are organised by a memorandum of understanding. Finansinspektionen is the Swedish financial supervisory authority.

In addition to its oversight of the Swedish financial infrastructure, the Riksbank participates in the cooperative oversight of the Continuous Linked Settlement (CLS) Bank¹¹ (the international foreign exchange settlement system) and SWIFT¹² (the international messaging system). Since 2010, the Riksbank has also taken part in the cooperative oversight of the EMCF.

⁹ Systemically important payment systems are either systems that settle large-value payments or systems that are indispensable due to the lack of an alternative.

¹⁰ In Sweden these systems are currently RIX, BGC, Euroclear Sweden and NASDAQ OMX DM.

¹¹ Together with the 17 central banks of the currencies settled in CLS under the lead of the Federal Reserve Bank of New York, governed by the *Protocol for the Cooperative Oversight Arrangement of CLS*. For more details on CLS, please see the corresponding chapter in the forthcoming second volume of this publication.

¹² SWIFT stands for "Society for Worldwide Interbank Financial Telecommunication". The National Bank of Belgium acts as lead overseer.

The provision of an interbank settlement system

The Riksbank has no formal obligation to provide settlement services to banks, but the Sveriges Riksbank Act allows for this possibility. The Riksbank does provide interbank settlement facilities for banks, the Swedish National Debt Office and a few other financial institutions through RIX, which it owns and operates, as well as providing deposit and credit facilities (see Section 3.2.1.5). Via their accounts in RIX, the participants (credit institutions) can deposit funds or borrow both intraday and overnight against collateral: intraday to ensure a smooth flow of payments, or overnight in the context of monetary policy operations.

The terms and conditions for participants are set out in the Terms and Conditions for RIX and monetary policy instruments (see Section 3.2.1). Each participant enters into an accession agreement with the Riksbank in its capacity as settlement provider and system owner.

The Riksbank does not act as a banker to the government. This service is provided by the Swedish National Debt Office (see Section 1.3).

1.3 The role of other public and private sector bodies

Public sector bodies

*Finansinspektionen*¹³

Finansinspektionen is the Swedish financial supervisory authority. Finansinspektionen is responsible for the supervision of companies operating in the credit, insurance and securities markets. This includes the supervision of all clearing organisations and payment systems, except for RIX, which is operated and overseen by the Riksbank. Contribution to the stability and efficiency of the Swedish financial sector is part of Finansinspektionen's overall objective. Finansinspektionen reports to the Ministry of Finance.

*The Ministry of Finance*¹⁴

The mandate of the Ministry of Finance is to see that legislation is in place that assures the efficiency and stability of the financial system. The Ministry of Finance also follows developments in the financial markets and business sector so that it can assess the need for new legislation or amendments to existing laws.

Much of Sweden's financial markets legislation stems from the European Union. The European Union's goal is to establish a single market for financial services. The Ministry of Finance represents Sweden's positions at EU meetings and is involved in formulating Community legislation in the financial markets area.

The Ministry of Finance is, inter alia, responsible for the National Debt Office, Finansinspektionen, the National Pensions Funds and the Swedish Pensions Agency.

*The Swedish Competition Authority*¹⁵

The Swedish Competition Authority, Konkurrensverket, is a state authority with responsibility for safeguarding and increasing competition, and for supervising public procurement in Sweden. A new Competition Act came into force on 1 November 2008. Based on EC competition rules, the Act contains provisions against anti-competitive collusion and abuse of

¹³ Read more about Finansinspektionen at www.fi.se.

¹⁴ Read more about the Ministry of Finance at www.regeringen.se.

¹⁵ Read more about the Swedish Competition Authority at www.konkurrensverket.se.

dominant market positions. It also contains rules that govern market concentrations between companies. In addition to applying the Competition Act, the Authority makes proposals for changes to rules and other measures that aim to eliminate obstacles to effective competition. It also disseminates expertise on competition issues.

The Swedish Consumer Agency¹⁶

The Swedish Consumer Agency, Konsumentverket, is the government agency responsible for consumer protection in all areas, including payment systems. In practice, the agency's role in the payment systems field mainly concerns the debit and credit card sector, where guidelines have been formulated and negotiated with the card-issuing companies.

The Swedish National Debt Office¹⁷

The Swedish National Debt Office, Riksgälden, is an agency reporting to the Ministry of Finance; its responsibilities include the management of cash and central government debt, as well as the provision of state guarantees and loans. Additionally, the National Debt Office is responsible for the deposit insurance and investment schemes and for government support to banks. The National Debt Office participates in the RIX system as the government agency responsible for the processing and management of government payments.

Private sector bodies

The Swedish Bankers' Association¹⁸

In the private sector, the Swedish Bankers' Association, Svenska Bankföreningen, has standing committees which discuss and coordinate issues concerning the processing of payments and regulatory and technical aspects of payment systems. One example is that, within the framework of this association, RIX participants¹⁹ enter into agreements with each other about cutoff times and the processing of payments. The Association is also owner of a retail payment system (credit transfer) in Sweden, the Data Clearing System, which is operated by BGC.

The Swedish Securities Dealers Association²⁰

The Swedish Securities Dealers Association (SSDA), Svenska Fondhandlareföreningen, is an association that represents the common interests of banks and investment services firms active on the securities market. The mission of SSDA is a sound, strong and efficient Swedish securities market. SSDA promotes members' views on regulatory, market and infrastructure-related issues. It also provides a forum for discussing and exchanging views on matters of common interest to its members.

SSDA's membership comprises banks and investment services firms active in the Swedish securities industry.

¹⁶ Read more about the Swedish Consumer Agency at www.konsumentverket.se.

¹⁷ Read more about the Swedish National Debt Office at www.riksdagen.se.

¹⁸ Read more about the Swedish Banker's Association at www.bankforeningen.se.

¹⁹ Excluding the public entities.

²⁰ Read more about the Swedish Securities Dealers Association at www.fondhandlarna.se.

*PAN Nordic Card Association*²¹

PAN Nordic Card Association is an organisation for Nordic banks working with payment cards. Members are banks within the Nordic Region. Banks can be members directly, or indirectly as a group member of a global general bank card scheme. The Association has five direct members and five indirect members as of May 2010. The association covers Sweden, Norway, Denmark, Finland, Iceland, Latvia, Estonia and Lithuania.

2. Payment media used by non-banks

2.1 Cash payments

Cash payments still account for a large share of total payments in Sweden, although no precise statistics are available. The ratio of the outstanding stock of banknotes and coins to GDP is about 3% as of 2009.

The availability of cash has increased over the past decade, thanks to the growing number of ATMs, which rose from about 2,200 in 1991 to about 3,300 in 2009. Although ATMs are operated on one of two different types of systems, there is a unified network in the sense that the underlying systems – some of which are proprietary, while others are owned collectively by a group of banks – are linked to each other. Individuals can thus make withdrawals, without charge, at any branch of any bank or at any ATM, regardless of which bank holds their account. These ATMs also accept any type of credit or debit card. There is also an independent ATM supplier, Kontanten, which serves about 400 ATMs in Sweden. Kontanten is linked to Visa and MasterCard and withdrawals are free of charge. Only holders of Visa or MasterCard credit and debit cards can make withdrawals at this type of ATM. Cash-back through points of sale (POS) is also increasingly popular, especially in rural parts of Sweden where ATMs are lacking.

2.2 Non-cash payments

2.2.1 Credit transfers

The two retail payment systems in Sweden are the BGC payment system Bankgirot, managed by Bankgirocentralen BGC AB (BGC), and PlusGiro²² managed by a private bank, Nordea. The bulk of non-cash payment transactions by companies and households is made through these two systems. The systems cover a wide range of transactions for both households and companies; the vast majority of Swedish enterprises and organisations hold accounts with both systems. The PlusGiro and Bankgirot numbers are always connected to a bank account. The bank account can be used to transfer money to either a PlusGiro or a Bankgirot number. The final settlement of transactions processed through these two systems always takes place in the RIX RTGS system.

BGC's payment system has increased its market share during the last few years and is today the most widely used retail payment system. The services provided by these two systems

²¹ Read more about the PAN Nordic Card Association at www.pan-nordic.org.

²² PlusGiro (former Postgirot), established in 1925, was until 2001 wholly owned by the Swedish Postal Service. Since 2005, however, PlusGiro has been only a trademark for payment services offered by Nordea Bank. To use PlusGiro payment products one must be a private or corporate customer of Nordea Bank. PlusGiro services cater for all types of payment transactions in all currencies – giro payments (only in SEK and EUR), credit transfers, wages, foreign payments, financial payments etc.

are generally included in the package of services that banks offer their account-holding customers – households and enterprises alike. In 2009 these two systems together accounted for about 92% of the value of all non-cash transactions.

Billers typically present their bills on paper but it has become increasingly common to use electronic invoices. Enterprises and organisations submit their payment orders almost exclusively by electronic media, while households are more frequently making payments via internet bank services. In 2009, around 97% of all transactions by value were generated electronically, while the remainder was paper-based. This is a 3% increase compared to 2005.

Paper-based payments are usually initiated via a form sent by mail to the debtors' bank. Privatgirot AB is a supplier of paper-based payment services, with the primary role of scanning, interpreting and verifying paper-based documents. The service lets Swedish banking clients make payments using forms. Paper-based payments through BGC's payment system are credited to the recipient on the same day that Privatgirot processes the order. PlusGirot payments are credited to the recipient on the business day following that on which Privatgirot processes the order.

A number of credit transfers also go directly from bank account to bank account. These credit transfers are channelled by the Data Clearing System and processed by BGC's payment system. Account numbers and payment messages are transferred in accordance with a standardised format, which allows for straight through processing (STP).

As SEPA only applies to payments made in euros, no national payments in Sweden are affected, generally speaking. Payments that are affected are those made in euros between Sweden and a euro area country. The two Swedish retail payment systems handle payments in Swedish kronor and domestic euro payments. However, no cross-border payments are handled by these systems. In other words, the initial impact of SEPA in Sweden will be very slight.

2.2.2 Cheques and money orders

The use of cheques in Sweden is very limited. All cheques are truncated, that is, the presenting bank retains the physical document and the information is transmitted by electronic media to the drawee bank. A cheque can be cashed at any branch of any bank, irrespective of the bank on which it is drawn.

Unlike cheques, money orders are still common. They are a secure form of payment instrument that is used in connection with major purchases paid for in cash, such as car purchases. A money order is bought at one of the Swedish banks for the desired amount and is made out to the recipient or to the buyer of the money order. If the money order is made out to the buyer, it can later be assigned to the ultimate recipient and thus constitutes a secure form of payment as it has already been paid for.

Collectively, cheques and money orders are used only in a very restricted sphere: they represented only 0.6% of the value of all transactions in 2005 and only 0.3% in 2009.

2.2.3 Direct debits

BGC's payment system is the only system that provides direct debit services, which are known as *autogiro* in Sweden. Direct debits still account for a rather limited share – around 8% in 2009, level with 2005 – of the total number of non-cash transactions. They are typically used for recurring payments such as rent or electricity bills.

E-invoicing is also used for these kinds of payments, which may help to explain why the take-up of direct debit is lower than in other countries. There is no euro-denominated domestic direct debit scheme; therefore, no SEPA direct debit scheme will be introduced in Sweden.

2.2.4 Credit and debit cards

Card usage has increased rapidly in Sweden in recent years. Between 1999 and 2009, the number of card payments increased almost sevenfold, from around 250 million transactions in 1999 to almost 1,700 million in 2009. The value of these transactions increased from SEK 174 billion in 1999 to SEK 735 billion in 2009. Previously, cards were used more to withdraw cash from ATMs than to make payments. In recent years, however, there has been a marked change. In 2005, for the first time, the transaction value at card payment terminals exceeded that of cash withdrawals from ATMs. In 2009, the number of card transactions at payment terminals was almost six times higher than the number of cash withdrawals from ATMs. In terms of the number of payments, cards are now the most widely used payment instrument.

The value of an average card payment has fallen significantly over the last 10 years, from approximately SEK 700 to more than SEK 400. Swedes are thus using cards more often to pay smaller amounts.

Almost all debit and credit cards issued by banks in Sweden are connected to the international card schemes of MasterCard or Visa. There is no national card scheme and all credit and debit card brands are accepted. Debit cards account for 80% of the transaction value of all card payments, which also corresponds to the number of cards in use.

Most cards are equipped with an EMV chip and – in line with the SEPA cards framework – by the end of 2010 all cards, all ATMs and all POS terminals will use the chip when a payment is made.

2.2.5 Prepaid cards

The sole prepaid card in operation is issued by the Swedish National Debt Office in cooperation with a commercial bank. It was introduced in 2010 and is used by public authorities to provide people without a bank account with a means for making electronic payments. The prepaid card is connected to the MasterCard scheme and accepted at any MasterCard-affiliated merchant or ATM.

Some chains of merchants also issue their own prepaid cards. But such cards can only be presented at outlets connected to the specific chain and hence their use is very limited.

2.3 Recent developments

Internet banking has expanded very rapidly in Sweden. All banks offer internet services, which let users access account information, make credit transfers to other customers within the same or at another bank, pay bills and trade securities online. According to a Riksbank survey of 2009, about 70% of Swedish citizens regularly use online banking services. Paper-based bill payments still account for the largest share of online activity but e-invoicing is becoming increasingly popular. The share of transfers between accounts via internet banking is also growing. Online banking has also greatly simplified the task of making transfers between accounts at different banks.

Mobile phone banking is the latest innovation in online banking. Some banks have started to offer banking services to their customers via mobile phone applications. Pilot projects for making payments by mobile phone also exist.

Some Swedish banks also offer e-payment solutions that let consumers use their familiar online banking environment to make an online payment to a webshop.

3. Payment systems (funds transfer systems)

3.1 General overview

The RIX system (RIX), the funds transfer system owned and operated by the Riksbank, is the hub of the Swedish payments system and operates on a real-time gross settlement (RTGS) basis.

The main system for retail payments is the Bankgirot. The Bankgirot is an ACH managed by BGC and owned by the banks. The Bankgirot system handles mainly retail payments, but also processes certain large-value payments. Bankgirot payments are settled on a bilateral net basis in RIX.

3.2 Large-value payment system

3.2.1 RIX

3.2.1.1 Institutional framework

The Riksbank owns and operates RIX. RIX is a registered settlement system under the Act (1999:1309) governing systems for settlement of obligations in financial markets. As the provider of RIX, the Riksbank determines the Terms and Conditions for RIX and monetary policy instruments. Through the accession agreement, a private law contract, the participant is bound by the Terms and Conditions.

The Riksbank has established the RIX Council as a forum for discussions with representatives of the RIX participants on strategic issues. RIX is overseen by the Riksbank.²³

The Terms and Conditions stipulate that settlement in RIX is final and irrevocable when the participant's account is credited.

3.2.1.2 Participation in the system

The Riksbank accepts the following categories of institutions as participants in RIX:

- credit institutions;²⁴
- investment firms (provided that they are permitted to trade in financial instruments or to provide guarantees in connection with issues of securities);
- clearing organisations; and
- the Swedish National Debt Office.

A participant can have the status of an *account holder* and/or an *agent*. An account holder can only send its own instructions while an agent can send funds transfer instructions on behalf of account holders or non-participating institutions. Some smaller banks use this type of arrangement. RIX has no relation to such non-participating institutions.

In mid-2010, two participants had the status of an agent, both also having the status of an account holder. In mid-2010, RIX had 23 participants, including the Riksbank. Of these, 17

²³ RIX is operated by the Riksbank's Asset Management Department. The oversight of the system is carried out by the Financial Stability Department.

²⁴ According to the EU definition, which includes a number of institutions that are regarded as investment firms according to Swedish legislation.

were credit institutions, including six branches of foreign banks. The other institutions were BGC, Euroclear Sweden, the European Multilateral Clearing Facility (EMCF), NASDAQ OMX and the Swedish National Debt Office.

RIX is open to remote participants, ie participants without domicile in Sweden. Currently the only remote participant is CLS Bank.

3.2.1.3 *Types of transactions handled*

RIX is used to settle interbank and customer payments. Payments arising from the Riksbank's own transactions with participants, primarily the trading of securities or currencies and the deposits and withdrawals of Swedish banknotes and coins, are also settled via RIX.

An individual payment can be registered and subsequently settled at any time during the system's operating hours. From the Riksbank's viewpoint, there is no minimum amount for the settlement of individual payments. However, under an agreement between RIX participants, payments below SEK 0.5 million should be aggregated.

Bilaterally aggregated payments are divided into the following three categories:

- foreign payments (settlement of the SEK leg of payments to/from abroad that are to be forwarded to another bank in Sweden);²⁵
- Data Clearing (settlement of customer payments between banks relating to transfers, the cashing of cheques and bank drafts, and card payments); and
- BGC settlements (settlement of Bankgirot transfers, settlement of notes and coins etc).

For each category, settlement takes place one or more times per day.

The Swedish CCP for derivatives and repo transactions, NASDAQ OMX DM, uses RIX to settle the payment obligations between the participants on a multilateral net basis. NASDAQ OMX DM sends fund transfer instructions acting as an agent. BGC's settlement of cash withdrawals at ATMs as well as card transactions is also carried out on a multilateral net basis.²⁶

For settlement of the cash leg for securities transactions, the Riksbank provides special settlement accounts, which are administered by Euroclear Sweden, the Swedish CSD, on behalf of the Riksbank. Those accounts are funded by transfers from the respective participant's account in RIX. RIX is also used for pay-ins to and pay-outs from CLS Bank.

3.2.1.4 *Operation of the transfer system and settlement procedures*

RIX operates on a real-time gross settlement (RTGS) basis. This means that fund transfers are settled, irrevocably and finally, one by one, on a continuous basis, and that the funds, which are immediately transferred to the participants' accounts at the Riksbank, are available for new payments while the system is open. The settlement, one by one, may take place simultaneously with the settlement of several funds transfers in gridlock resolution processes that are carried out at short intervals during the day. The gridlock resolution process makes a check for a bank with payments that cannot be settled due to a lack of liquidity, whether or not the circumstances are the same for the receiving banks. If this is the case, underlying payments are netted as far as possible with subsequent settlement.

²⁵ Not aggregated by all participants.

²⁶ Normally BGC settlements are gross bilateral positions but for these particular products (cash withdrawals at ATMs and card transactions) settlement is carried out on a multilateral net basis.

The RIX technical system is a product of the Italian firm SIA-SSB (Perago: rtgs developed by its South African subsidiary Perago Financial Systems Enablers). The system is operated by the Riksbank.

Most of the communication between the system and participants is via SWIFT, the international system for sending different types of standardised messages between financial institutions. However, it is also possible, via the RIX-Online service, for participants in RIX to register payment orders, see their account status in the system, reprioritise the order of payments in queues, change the use of collateral, submit queries etc. In this case communication between the system and participants takes place via the Stockholm Financial Network or through the internet. Participants are obliged to have a connection to RIX-Online as well as a SWIFT connection.

RIX has six settlement processes that work partly in parallel. One of the processes, the real-time settlement mechanism (RTM), has no queuing functionality. This process is used mainly for some urgent transactions and is the only available process towards the end of the day. The other five processes (liquidity optimisation mechanisms or LOMs) have a queuing function, which stores the participants' funds transfers in a queue (one for each process) when there is insufficient liquidity. The payments are settled automatically when liquidity is available. These processes apply the FIFO bypass next principle, ie the first funds transfer in the queue is settled first, but if the first funds transfer is larger than the available liquidity, the next possible funds transfer with the same priority will settle. RIX participants can alter the settlement order by changing the order of the payments in the queue, and, in some of the processes, change the priority.

The selection of settlement process for a funds settlement instruction is based on the receiver code specified in the instruction. Four of the LOM processes are dedicated to specific clearing and settlement systems, namely BGC, CLS, Euroclear Sweden and NASDAQ OMX DM.

Each LOM process has its own intraday settlement account and only the liquidity on that account can be used for settling funds transfers using this process. The participant can make internal transfers between its RTM account²⁷ (including an automatic credit facility) and the LOM accounts.

RIX accepts instructions 10 calendar days before their intended settlement day. The participant can specify a certain settlement time of the day in the funds transfer instruction.

According to the Terms and Conditions of RIX, settlement is final and irrevocable when the participant's account is credited.

The RIX opening hours for settlement are from 07:00 to 17:00 each banking day (Monday to Friday, excluding holidays).

The Riksbank has backup computer facilities located at physically separate sites. Communications to the computer facilities are duplicated and all production data are updated in real time. If a breakdown in operations should occur, a switch to the RIX backup system takes place automatically.

3.2.1.5 Risk management

Since there is no delay between the system's acceptance of a funds transfer for settlement and final settlement, the credit exposure between participants is eliminated in RIX.

The assets used to effect settlement in RIX consist of central bank money, which carries no liquidity or credit risk.

²⁷ Also called principal account.

The Riksbank provides intraday credit to any participant in RIX.²⁸ The credit is limited only by the value of the collateral provided by the participant. The Riksbank accepts a broad range of collateral including domestic and foreign securities as well as cash balances in certain currencies.²⁹

Collateral is marked to market daily and haircuts are used as risk control measures. The eligibility requirements for securities used as collateral include rating and listing requirements. Neither collateral issued by Swedish banks or foreign credit institutions domiciled in the same country as the RIX participant, nor collateral issued by an entity with close links to a RIX participant, is accepted. However, there are exceptions for certain covered bonds. Collateral, in the form of pledged securities, can be held at the domestic CSD Euroclear Sweden, at Euroclear Bank or at the Danish and Norwegian CSDs, with the respective central bank acting as counterparty. Cash balances in foreign currency can be held at the Danish and Norwegian central banks as well as at the Riksbank (EUR).

It is possible for a participant to change the amount of collateral within a short period of time during the day. This procedure is fully automated with regard to collateral held at the domestic CSD.

3.2.1.6 Pricing

The fees charged to participants must cover the Riksbank's costs for RIX.

The fee structure is based on a fixed and a variable component. Apart from a fixed monthly fee for participants who are entitled to credit, participants that have overall domestic revenues of at least SEK 1 billion pay a supplementary monthly fee. This fee is divided among the participants based on their domestic revenues. There is also a single fee per transaction paid by the sender and an admission fee for each new participant.

3.2.1.7 Major ongoing and future projects

RIX was first introduced in 1990. In 2009 the technical system and the technical platform were replaced. In 2010 an upgrade of the technical platform will take place.

3.3 Retail payment systems

3.3.1 Bankgirocentralen BGC AB

Bankgirocentralen BGC AB (BGC) is a wholly owned subsidiary of BGC Holding AB, which is owned by eight Swedish banks. BGC was established in 1959. BGC acts as an ACH and manages a payment system and a clearing and settlement service.

BGC's payment system consists of a technical system platform where a number of payment products are processed. Some of these payment products are offered by BGC and called Bankgiro products.

The clearing and settlement service is used to clear and create documentation for settlement of different payment products before they are finally settled in the funds transfer system, RIX.

In addition, BGC also offers other payment-related services such as electronic invoicing and e-identification.

²⁸ Overnight credit in the form of monetary policy facilities is only available to credit institutions with their domicile or a branch in Sweden.

²⁹ These currencies are the Danish krone (DKK), euro (EUR) and Norwegian krone (NOK).

3.3.1.1 Institutional framework

Finansinspektionen has granted BGC a licence to conduct clearing operations in accordance with the Swedish Securities Market Act (SFS 2007:528). Accordingly, BGC is supervised by Finansinspektionen. BGC's clearing and settlement service has been approved by Finansinspektionen in consultation with the Riksbank and notified to the European Commission in accordance with the provisions of the Swedish act on systems for settlement of obligations on the financial market (SFS 1999:1309), which is based on the EC settlement finality directive. BGC is also overseen by the Riksbank.

The payment system

To participate in BGC's payment system institutions must fulfil the participation criteria. The regulations regarding the payment system are set out in a main agreement, signed by all participants, that specifies the parties' basic obligations and rights. A number of underlying agreements are linked to the main agreement, such as the product agreement, the operation agreement, the service agreement and the agreement on BGC's clearing and settlement service.

The clearing and settlement service

To use the BGC clearing and settlement service, a participant must fulfil the participation criteria and sign the agreement on BGC's clearing and settlement service. The agreement includes, among other things, a description of routines and a timeplan and process for clearing and final settlement in RIX. The participant is also required to use BGC's clearing information system or the equivalent. For those participants (direct participants) who have taken on indirect participants, the agreement on BGC's clearing and settlement service between BGC and the direct participant also includes information regarding indirect participants.

3.3.1.2 Participation in the payment system

The payment system is an open system, implying that any institution according to regulations in Chapter 1, Paragraph 3 in the Law on Payment Services (2010:751) (eg banks and payment institutions) that meets the participation criteria can join the system. The Swedish National Debt Office is also a direct participant. At the end of 2010 the payment system had 22 direct participants and 62 indirect participants.

3.3.1.3 Types of transactions handled

BGC's clearing and settlement service includes clearing for Bankgiro products as well as for certain payment products that are not Bankgiro products. These payment products are credit transfers, paper-based payments, ATM withdrawals, card payments and transactions originating from cash handling by banks.

The Bankgiro products provided by BGC include, among others, direct debit, and various kinds of credit transfer.

In addition to the payment systems, BGC also provides electronic invoicing and e-identification services.

3.3.1.4 Operation of the transfer system and settlement procedures

Through BGC's payment system, retail payments, mainly credit transfers and transfers between accounts, are made between banks in Sweden. The majority of these payments are aggregated bilaterally and cleared on a bilateral gross basis, that is to say, between two participants. The remainder are cleared on a multilateral net basis, that is to say, between several participants. All types of payments have one or more predetermined daily settlement times. The payment orders mediated via BGC are settled either in the Riksbank's fund

transfer system, RIX, or via the euro large-value system, TARGET 2, depending on whether the payment is denominated in SEK or EUR.

As regards Bankgiro products, BGC is responsible for authorisation, clearing and creating documentation for settlement, and for payment information to the sending and receiving banks. In addition, BGC provides payment information to the payer and payment recipient. The clearing and settlement service is also used for certain payment products that are not Bankgiro products. A common feature of these payment products is that authorisation and, in some cases, portions of the clearing are usually processed in one of several pre-systems before the transaction reaches BGC's payment system.

3.3.1.5 Risk management

As major portions of the payments are cleared using the bilateral gross amount method, and as failure management routines have been established to handle the multilateral net positions, credit risks between the participants are kept to a minimum. The RIX system, where the transactions are settled, also provides liquidity-saving mechanisms, as well as the possibility of reserving liquidity for a specific settlement, thus contributing to a low liquidity risk (see also Section 3.2.1.4).

Even though payments via BGC usually constitute a relatively small part of a participating bank's total flows, the agreement on BGC's clearing and settlement service provides an incentive for participants to be cautious in their liquidity management. The agreement explicitly requires participants to have sufficient liquidity in their RIX and TARGET2 accounts. If a participant cannot fulfil its obligations, its agreement with BGC's clearing and settlement service is automatically revoked. Without this agreement, the participant no longer has the right to participate in BGC's clearing and settlement service. As a result, it is unable to effect payments on behalf of itself or its clients, or their indirect participants via the BGC's payment system or for other payments handled in BGC's clearing and settlement service.

3.3.1.6 Pricing

New participants pay an affiliation fee to join BGC's payment system. As of 2010, an annual fee is also charged. Expenses for participation in BGC's payment system are paid by direct participants, who in turn charge indirect participants as applicable. The pricing model is the same for all participants and is based on transaction volumes and service level.

3.3.1.7 Major ongoing and future projects

In 2007, BGC decided to start a strategic cooperation, mainly concerning BGC's payment system, with VocaLink in the United Kingdom (UK), whose activities include operating the British retail payment system, BACS. In its capacity as supplier, VocaLink will manage the IT operations of BGC's payment system. The objectives of this cooperation are to offer Bankgiro products at a lower price and to meet market demand for new payment products. BGC will retain its current role in relation to the banks, their clients and the authorities.

4. Systems for post-trade processing, clearing and securities settlement

4.1 General overview

Euroclear Sweden is the Swedish CSD and operates the SSS. There is also a derivative and repo CCP, which is run by NASDAQ OMX DM.

EMCF was introduced in the Swedish equity market in 2009 and acts as a CCP in the clearing of equity transactions on the NASDAQ OMX exchanges in Stockholm, Copenhagen and Helsinki and on some other multilateral trading platforms operating in the Nordic countries.

4.2 Central counterparties and clearing systems

4.2.1 NASDAQ OMX Derivatives Markets, central counterparty

NASDAQ OMX Derivatives Markets (NASDAQ OMX DM) offers a fully integrated Nordic derivatives market with trading in standardised Swedish, Norwegian, Finnish, Danish, Icelandic, Russian and Baltic equity derivatives instruments and CCP clearing. The members are also offered a CCP clearing service for interbank traded fixed income derivatives, trading and CCP clearing of tailor-made derivatives contracts (TMC) on listed shares, tradable indexes, custom-made indexes and interest rate products. In 2010, NASDAQ OMX DM introduced CCP clearing for repo transactions in the Swedish market. NASDAQ OMX Stockholm AB (see the next section for the relationship between NASDAQ OMX Stockholm AB and NASDAQ OMX DM) also owns Nord Pool Clearing ASA, the CCP in electricity derivatives and other contracts traded on the Nord Pool ASA exchange (based in Norway and owned by NASDAQ OMX Group). It also performs clearing services for spot electricity trading in the UK and will start clearing power derivatives in early 2011. The clearing and settlement of electricity derivatives and emission rights are conducted via a Norwegian branch of NASDAQ OMX Stockholm AB.

This chapter focuses on NASDAQ OMX DM's role as a CCP and as a clearing organisation for derivatives.

4.2.1.1 Institutional framework

NASDAQ OMX DM is a secondary legal name for NASDAQ OMX Stockholm AB and is used for operations involving the trading and clearing of derivatives and CCP clearing of repo transactions.³⁰ NASDAQ OMX Stockholm AB is part of the NASDAQ OMX Group and is a subsidiary of NASDAQ OMX Nordic Oy. The Group's parent company is the listed American company, NASDAQ OMX Group.

NASDAQ OMX DM's role as a CCP is regulated by Swedish legislation and NASDAQ OMX DM's own rules and regulations. The applicable Swedish legislation is the Swedish Securities Market Act (2007:528), the Swedish Financial Instruments Trading Act (1991:980), the Swedish Rights of Priority Act (1970:979) and the Swedish Bankruptcy Act (1987:672). NASDAQ OMX DM's own rule set, the rules and regulations of NASDAQ OMX Derivatives Markets, defines terms and conditions relating to exchange and clearing operations.

In order to conduct trading and CCP clearing of derivatives, NASDAQ OMX Stockholm AB is authorised as an exchange and has a permit from Finansinspektionen to conduct clearing operations in accordance with the Swedish Securities Market Act (2007:528). Finansinspektionen has approved and registered NASDAQ OMX Stockholm AB with the European Commission in accordance with the Act on Systems for the Settlement of Obligations on the Financial Market (1999:1309). NASDAQ OMX Stockholm AB is subject to supervision by Finansinspektionen and to oversight by the Riksbank.

³⁰ A secondary legal name is not a legal entity but refers to a certain part of a company's operations. Secondary legal names are registered with the Swedish Companies Registration Office.

4.2.1.2 Participation

Participation in NASDAQ OMX DM requires a membership. There are three categories of participants in NASDAQ OMX DM's derivative operations:

- non-clearing member: trading member who clears trades via a general clearing member;
- direct clearing member: entitled to participate in the clearing activities at the CCP on its own behalf, on behalf of a customer regarding transactions registered on individual customer accounts and on behalf of a customer regarding transactions registered on aggregated customer accounts; and
- general clearing member: similar to a direct clearing member except that a general clearing member can also participate in clearing activities on behalf of non-clearing members.

The requirements for membership in NASDAQ OMX DM's clearing system are defined in NASDAQ OMX DM's rules and regulations. These set out the requirements in terms of organisation, risk management and technical systems. The financial requirements are that a direct clearing member must have a capital base of at least SEK 10 million and a general clearing member at least SEK 500 million. Both direct and general clearing members must be legal entities with permission to operate a securities business in accordance with the law of the country where they are domiciled. The member must also have qualified brokers and back office personnel.

4.2.1.3 Types of transactions

NASDAQ OMX DM practises what is known as "end-customer clearing". This involves customers, both financial institutions and private individuals, who normally have their own accounts and a direct contractual relationship with the CCP. End-customers can neither trade directly with NASDAQ OMX DM nor act as clearing members and clear transactions.

As an alternative to end-customer clearing, NASDAQ OMX DM offers member clearing. Both direct and general clearing members are allowed to clear transactions on their own behalf, for customers who have concluded a customer agreement with NASDAQ OMX DM and for customers on whose behalf transactions are registered in an omnibus account.

Unlike end-customer clearing, member clearing means that NASDAQ OMX DM is only permitted to have a contractual relationship with the clearing member, and not with the customer. This means, in turn, that NASDAQ OMX DM does not assume any customer-specific risk in member clearing as it does in end-customer clearing.

NASDAQ OMX DM operates two types of payment flows: (i) a pure cash settlement which takes place when a contract is fully or partly redeemed in cash;³¹ and (ii) payment flows that arise when securities are exchanged against cash.³²

Most of NASDAQ OMX DM's payments are made in SEK. Cash settlements in Sweden take place via the Riksbank's funds transfer system, RIX. Thus, because NASDAQ OMX DM is a RIX participant, the major share of NASDAQ OMX DM's cash settlements is made in central bank money.

³¹ Pure cash settlements take place in conjunction with payments of premiums, fees and daily settlements of futures contracts.

³² The payment flows that arise after redemption of a contract and the exchange of the underlying security against cash (DVP) via the local CSD.

4.2.1.4 Operation of the system

Derivative transactions traded on NASDAQ OMX DM are automatically transferred to the clearing system. Other transactions, such as OTC derivative and repo transactions, are fed into the system through interfaces with members' in-house systems. When a transaction is accepted for clearing (ie after it has been successfully captured, matched and confirmed), NASDAQ OMX DM becomes counterparty to the parties involved, ie the seller to the buyer and the buyer to the seller.

As counterparty, NASDAQ OMX DM guarantees completion of each transaction, regardless of the original counterparty's ability to pay and deliver. NASDAQ OMX DM does not, however, undertake to complete the transaction on the appointed day if the counterparty cannot fulfil its obligations or if a participant fails to deliver securities promptly.

Delivery and custody of securities take place in dematerialised form and are administered by the CSD Euroclear Sweden for securities issued in Sweden.³³ NASDAQ OMX DM is a member of Euroclear Sweden. The bulk of all securities are registered in Euroclear Sweden's system, which enables gross settlement and is based on the principle of delivery versus payment (DVP) in central bank money.³⁴

NASDAQ OMX DM's derivatives clearing is conducted in SECUR, a system developed by the NASDAQ OMX Group. Contingency procedures are established; two computer and communication sites are maintained, and data are mirrored on a real-time basis.

4.2.1.5 Risk management

For all outstanding contracts, sufficient collateral must be pledged to NASDAQ OMX DM. Collateral can be pledged either individually by each customer, or by the clearing member for both its own and its customer's obligations. Once collateral has been pledged, the risk associated with the exposures not covered by the collateral rests with NASDAQ OMX DM.

Margin requirements are calculated at the end of each day, and additional collateral must be delivered before 11:00 of the following day. NASDAQ OMX DM can also make intraday margin calls. NASDAQ OMX DM accepts different types of assets as collateral, including cash in seven currencies,³⁵ government securities from seven countries,³⁶ certain warranties/guarantees, bank certificates issued by Swedish, Danish and Finnish banks, bonds and certificates issued by Swedish, Danish and Finnish banks and societies, and certain Norwegian listed shares. Collateral is deposited with a custodial institution accepted by NASDAQ OMX DM.

In addition to the collateral received from customers, NASDAQ OMX DM has its own financial resources that are intended to provide protection against losses in the event of default by customers. This so-called clearing capital is currently about SEK 2.3 billion. It consists of equity (including non-distributable reserves), retained profit and insurance.

If the counterparty's collateral is inadequate in connection with a default, NASDAQ OMX DM has the following fall-back procedure:

- (i) its own clearing capital;

³³ Other CSDs are used for other securities, eg VP Securities in Denmark, VPS in Norway and Euroclear Finland in Finland.

³⁴ A small proportion of NASDAQ OMX DM's delivery of securities is effected in the Danish, Finnish and Norwegian securities systems, which are all based on the DVP settlement principle.

³⁵ Sterling, Danish kroner, euros, Norwegian kroner, Swedish kronor, Swiss francs, US dollars.

³⁶ Securities from Denmark, Finland, Germany, Norway, Sweden, the United Kingdom and the United States.

- (ii) two credit lines in Swedish kronor for SEK 700 and SEK 500 million, respectively;
- (iii) the parent company Nasdaq OMX Group Inc also provides credit facilities to allow liquidity to be made available quickly. These credit facilities can only be used as clearing capital.

The clearing capital can be used to cover any losses incurred by NASDAQ OMX DM and by Nord Pool ASA Clearing.

4.2.1.6 *Links to other systems*

NASDAQ OMX DM is in the process of phasing out its former links with the derivatives exchanges and clearing organisations in London and Oslo. When this process is completed, NASDAQ OMX DM will no longer have any cross-border links.

4.2.1.7 *Pricing*

NASDAQ OMX DM members are charged clearing fees for trading-related activities, as well as technical fees for affiliation etc. Price lists are available on NASDAQ OMX DM's website.

4.2.1.8 *Major ongoing and future projects*

NASDAQ OMX DM will introduce a default fund in 2012 financed by contributions from its members. The default fund will take over the function of the current clearing capital and it will consist solely of NASDAQ OMX DM's own resources.

4.2.2 ***European Multilateral Clearing Facility, central counterparty***

While NASDAQ OMX DM is a CCP in the clearing of standardised derivative instruments traded on the NASDAQ OMX derivatives exchanges, the European Multilateral Clearing Facility (EMCF) is a CCP in the clearing of cash equity transactions traded on the NASDAQ OMX exchanges in Stockholm, Helsinki and Copenhagen. EMCF also provides CCP clearing services for transactions in European cash equities executed on Chi-x Europe, BATS Europe and Burgundy.

In 2009 EMCF launched its CCP clearing service in Sweden, to include instruments in OMXS30 and large-cap instruments. Any instruments that fall outside these categories but are currently in the scope of optional clearing within Nordic markets will also be part of the CCP's scope. Transactions are cleared according to the principle of multilateral netting. All clearing operations, regardless of the country where the trade is executed, take place in the Netherlands. Swedish transactions are settled by Euroclear Sweden (both the funds leg and the securities leg), where EMCF acts as a clearing member (for settlement of securities see Section 4.3).

EMCF is owned by NASDAQ OMX (with a 22% stake) and by ABN AMRO Bank NV (with a 78% stake).³⁷

4.2.2.1 *Ongoing projects*

There are plans to introduce two additional CCPs in the Nordic equity markets as of 2011, with a view to increasing competition. As this type of competition is rather novel, it will require supplementary (inter-CCP) risk management. How this will be done has not been finalised and must be approved by the relevant supervisory authorities before the new CCPs can start operating.

³⁷ Since EMCF is established and based in the Netherlands, we refer to the Dutch chapter in the second volume of this publication.

4.3 Securities settlement systems

4.3.1 Euroclear Sweden, securities settlement system

4.3.1.1 Institutional framework

Euroclear Sweden is Sweden's CSD and is Sweden's only domestic system for securities settlement. In 2008, the Belgian Euroclear Group took full ownership of NCSD Holding AB (NCSD Holding), which, in turn, wholly owned VPC (the Swedish CSD). Thus, the Swedish CSD moved into foreign ownership. In 2009, VPC's name was changed to Euroclear Sweden.³⁸ The change of ownership has not altered the Swedish CSD's legal status in Sweden. The company continues to be a Swedish-registered company subject to Swedish law and under the supervision of Finansinspektionen.

Finansinspektionen has approved Euroclear Sweden's settlement system for securities and has registered it with the European Commission in accordance with the Swedish Settlement Systems Act (SFS 1999:1309). Finansinspektionen has also authorised Euroclear Sweden as a central securities depository in accordance with the Swedish Act on Accounting of Financial Instruments (LKF) (SFS 1998:1479). As such, Euroclear Sweden complies with stringent requirements for security and efficiency.

Another important function for Euroclear Sweden is the provision of services to facilitate pledging. Swedish legislation provides support for pledging and the settlement of securities. According to the Swedish Rights of Priority Act (FRL) (SFS 1970:979), the party to whom collateral is pledged has a specific right of priority, ahead of other creditors, to the pledged property in the event of a bankruptcy.

Euroclear Sweden has been designated as systemically important by the Riksbank and Finansinspektionen and is subject to supervision by Finansinspektionen. It is licensed by Finansinspektionen to conduct clearing operations in accordance with the Swedish Securities Market Act (VpML) (SFS 2007:528). The Riksbank and Finansinspektionen jointly oversee the system and perform a yearly assessment.

4.3.1.2 Participation

Euroclear Sweden accepts Swedish and foreign companies as participants. Participation requirements are stipulated in the Swedish Securities Market Act (SFS 2007:528) and in Euroclear Sweden's regulations. As of September 2010, 51 financial institutions were participating in Euroclear Sweden's securities settlement system. Some 1,230 issuers of financial instruments were affiliated in September 2010.

In its operations, Euroclear Sweden applies the principles of free access and neutrality. This implies that every party meeting the requirements of the Swedish Securities Market Act and Euroclear Sweden's regulations may participate in the system. Moreover, Euroclear Sweden is obliged to apply its regulations to all participants in a uniform manner.

4.3.1.3 Types of transactions

Euroclear Sweden offers securities settlement. The company also provides custody services in support of registration, issuing and account structuring, in accordance with its authorisation as a CSD. Euroclear Sweden's account services include the distribution of payment instructions (for example for interest payments, tax reporting and tax collection), the safekeeping of securities and the provision of information and services in conjunction with corporate actions.

³⁸ However, Euroclear Sweden's securities settlement system is still known as "the VPC system".

The system is divided into a market for equities and equity-related instruments (AM) and a money market (PM). The AM handles mainly equity market instruments and interest-bearing instruments intended for private individuals, such as bonds and premium bonds. The PM handles interest-bearing instruments for the institutional market, such as treasury bills, mortgage certificates, and mortgage and government bonds.

During 2009, Euroclear Sweden settled an average of approximately 1,100 PM transactions and 109,000 AM transactions per day. For comparison, in 2005 the volumes were 1,600 PM transactions and 50,000 AM. The daily gross value of these transactions in 2009 was approximately SEK 266 billion for PM instruments and about SEK 25 billion for AM instruments.

Both Swedish and foreign securities handled in the system are dematerialised.

4.3.1.4 Operation of the system

The settlement process starts with participants registering instructions in the system, which are subsequently matched. After instructions have been matched no party may unilaterally recall them.

On the day of settlement the settlement banks³⁹ grant participants a limit for securities settlement for both Swedish kronor and euros. This limit is equivalent to the cash for the settlement process at the end client's disposal. The system subsequently checks that each settlement bank has sufficient liquidity to cover the transactions of the settlement bank, the participants and the end clients. If securities and cash are available, these assets are blocked for final settlement. The transaction is then marked as ready, meaning that payment is irrevocably made available to the recipient at the next day's settlement time and that securities and funds are exchanged on a DVP basis. The final stage of the settlement cycle, actual settlement, takes place at three specific times for the AM and at four specific times for the PM. The normal settlement cycle is T+2 for the PM and T+3 for the AM.

For securities settlement in SEK, the settlement banks have special accounts for central bank liquidity and associated credit accounts. The Riksbank has given Euroclear Sweden the task of administering these accounts. Even if these accounts are administered by Euroclear Sweden, the Riksbank has complete responsibility for them and their balances represent claims on the Riksbank. On behalf of the Riksbank, Euroclear Sweden can also approve intraday credit for securities settlement. As regards the cash settlement of securities transactions, the settlement banks have neither financial nor operative exposure towards the settlement system. For securities settlements denominated in EUR, Euroclear Sweden (on behalf of the Riksbank) uses client accounts in the TARGET2 system and the Bank of Finland.

4.3.1.5 Risk management

Euroclear Sweden does not act as a lender and does not grant credit to its participants in any form. Euroclear Sweden's settlement system is designed so that any implicit credit is avoided through the requirement that the securities and the payment required for each individual transaction are blocked before the transaction is marked as ready to settle (on a DVP basis). Following the control and blocking of securities and payment, the settlement of the transaction can be guaranteed, even if one of the counterparties should fail. Euroclear Sweden does not permit overdrafts for either securities or cash.

³⁹ The settlement bank supplies services related to the settlement of payments and operates on behalf of one or more clearing members. Moreover, a settlement bank handles the disbursement or receipt of payments at settlement.

The participants still face a counterparty risk in the form of a replacement cost risk (although not credit risk), as the possibility exists that their transactions will not be marked as ready to settle if their counterparty fails to fulfil its commitments. This risk is bilateral and does not entail an interruption of the settlement process.

Euroclear Sweden has routines for the identification, monitoring and management of operational risk. These involve emergency plans and appropriate backup systems. Euroclear Sweden has an independent organisational unit monitoring operational risk. This function reports directly to the management, providing it with regular information on the system's operational status.

4.3.1.6 Links to other systems

Euroclear Sweden has a limited number of foreign participants from EU and EEA countries and handles a small number of cross-border transactions via its links. Euroclear Sweden has cross-border links, either directly with other central security depositories or indirectly via custodian banks, to facilitate the transfer of certain foreign securities and all Swedish equities traded on NASDAQ OMX Helsinki. The implementation of the EC Settlement Finality Directive in Sweden implies that all transactions in Euroclear Sweden's settlement system are covered by Swedish legislation. Consequently, no cases of conflicting legislation should arise for the settlement services provided to participants from EU or EEA countries. At present, there are no participants from countries outside the EU/EEA area.

4.3.1.7 Pricing

New members pay one-time affiliation fees to cover administrative costs. Euroclear Sweden also charges its customers a monthly fee, as well as a per transactions fee and a fee for other services. In accordance with the European Code of Conduct on Clearing and Settlement,⁴⁰ information on the costs of joining Euroclear Sweden and on running costs for the various services is available on the website, together with a price list, pricing examples for various types of participants and a conversion table allowing the prices of various CSDs to be compared.

4.3.1.8 Major ongoing and future projects

Euroclear Sweden plans to consolidate its system with Euroclear Finland. Euroclear Sweden is introducing a new order routing, settlement and asset servicing solution for the domestic funds industry. The aim is to reduce settlement periods, operational risk levels and expenses.

4.4 Use of securities infrastructure by the central bank

The Riksbank is a direct participant in Euroclear Sweden and uses the service for taking collateral and for other business activities.

When it comes to collateral management the Riksbank uses Euroclear Sweden to receive securities as collateral. This collateral is used to support the intraday operations of the RIX, including the funds transfer system and other collateralised lending such as credits under the standing facilities.

To maintain price stability, the Riksbank's monetary policy operational framework is constructed so as to steer the overnight market interest rate. In the event of a borrowing requirement in the banking system, the Riksbank provides monetary policy repos (the

⁴⁰ https://secure.ncsd.eu/files/code_of_conduct.pdf.

Riksbank purchases securities and simultaneously agrees to sell them back on a specified later date) or credit (against collateral). If, instead, the banking system needs to deposit money in the Riksbank, the Riksbank responds by issuing Riksbank Debt Certificates. These securities transactions are all settled in Euroclear Sweden.