

**Payment systems in
Sweden**

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List of abbreviations

| | |
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| BGC | Bank giro centre - <i>Bankgirocentralen BGC AB</i> |
| RIX | The Riksbank's central interbank payment system |

Introduction

In terms of transaction volumes, the Swedish payment system is dominated by the giro systems, the Bankgirot system and the Postgirot system, which account for more than 71% of all non-cash transactions. A growing proportion of the transactions in both systems are initiated electronically - around 86% in terms of value - and both the Postgirot and the Bankgirot administer systems for credit transfers initiated electronically via the internet.

Bankgirocentralen, BGC AB (BGC), adopted a new clearing platform in 1999 for retail payments that will allow a full integration of all systems involved in the clearing and settlement cycle.

While the number of cheque transactions is now very low in Sweden, debit cards linked to bank accounts have gained in importance. Increasing automation is the main driving force, with the number of EFTPOS terminals in shops and at other points of sale increasing considerably over the past decade.

Sveriges Riksbank, the central bank of Sweden, owns and runs the RTGS system, RIX, which started operating in 1990. Since 1999 the RIX system has consisted of two parallel but separate systems: K-RIX for settlement in Swedish kronor and E-RIX for settlement in euros. Via E-RIX, the RIX system is linked to the ESCB's TARGET system.

Stockholmsbörsen AB, formerly OM Stockholmsbörsen, runs the Swedish stock exchange, the derivatives market and the new electronic inter-dealer exchange for government benchmark bonds. This same entity clears and acts as the central counterparty for derivatives transactions. Prior to 1998, the derivatives exchange and the stock exchange were two separate entities.

Stockholmsbörsen AB is part of an alliance of Nordic stock exchanges known as NOREX. The other members are the Copenhagen Stock Exchange, the Icelandic Stock Exchange and Oslo Börsen. Alliance members have a joint equity trading system and harmonised trading and membership rules.

The Swedish CSD, VPC AB (VPC), is a clearing organisation operating the SSS, called the VPC system. Equities, bonds and money market instruments are all dematerialised in the VPC system.

The Riksbank has two separate roles in the payment system: an oversight role and an operational role. The Riksbank was reorganised in mid-2000 in order to make the distinction between these two roles clearer. One result of the reorganisation is that the tasks and responsibilities associated with these roles have been assigned to two separate departments. The Financial Stability Department is responsible for the oversight role, while the Market Operations Department performs the operational functions.

1. Institutional aspects

1.1 The general institutional framework

1.1.1 *The institutions*

Sveriges Riksbank is the Swedish central bank. According to the Riksbank Act (*Lagen om Sveriges riksbank, 1988:1385*), the Riksbank shall promote a safe and efficient payment system. In order to achieve this, the Riksbank oversees and provides for the stability of the financial system and ensures the supply of banknotes and coin. The Riksbank also provides the central payment system, RIX.

The Riksbank's RIX system can be seen as the hub of the Swedish payment system. In addition to the Riksbank, the participants in the RIX system are the National Debt Office (handles government payments), credit institutions and the clearing houses: VPC (which clears and settles equities, bonds and money market instruments), Stockholmsbörsen (which clears and settles derivatives) and BGC (which clears and settles retail payments).

Finansinspektionen is the single Swedish financial supervisory authority. Finansinspektionen is responsible for the supervision of companies operating in the insurance, credit and securities markets, including the supervision of all clearing organisations.

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

1.1.2 **The legal framework for the payment and settlement systems infrastructure**

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

- The Sveriges Riksbank Act (*Lagen om Sveriges riksbank, 1988:1385*). This Act states that the Riksbank shall, inter alia, “promote a safe and efficient payment system”. The Riksbank may provide settlement system facilities and 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 an obligation, upon the request of the Riksbank, to provide the Riksbank with such information as the Riksbank considers necessary in order to ensure the stability of the payment system.
- The Settlement Systems Act (*Lag om system för avveckling av förpliktelser på finansmarknaden, 1999:1309*). This Act is based on the EC Directive on settlement finality in payment and securities settlement systems.¹ It governs the registration and approval of systems used for clearing and settling transactions with financial instruments.
- The Exchange and Clearing Operations Act (*Lag om börs- och clearingverksamhet, 1992:543*). This Act regulates the authorisation of exchanges or markets in which financial instruments can be traded. Clearing services can only be provided by Sveriges Riksbank or by institutions which have been authorised in accordance with this Act. Finansinspektionen is commissioned to grant this authorisation after a written procedure with the Riksbank.
- The Financial Instruments Accounts Act (*Lag om kontoföring av finansiella instrument, 1998:1479*). This Act regulates the registration of ownership of both dematerialised financial instruments and those material instruments which have been taken out of circulation. The responsibility for maintaining the ownership register is assigned to a CSD, which is granted authorisation by Finansinspektionen.
- The Trading in Financial Instruments Act (*Lag om handel med finansiella instrument, 1991:980*). This Act specifies the disclosures to be made, the information to be provided and the procedures to be followed when transactions with securities are undertaken. It also lays down a netting provision regarding contracts involving financial instruments. The Act is based on the EC Directive on public offers.²
- The Securities Operations Act (*Lag om värdepappersrörelse, 1991:981*). This Act provides the licensing requirements for securities firms and guidelines governing the supervision of such firms and the types of business in which such firms may engage. The Act is based on the EC Directive on investment services.³
- The Banking Business Act (*Bankrörelselagen, 1987:617*). This Act regulates the business which a bank may conduct, the prudential supervision of banks, the requirements for obtaining a banking licence and the requirements in respect of confidentiality, auditing, etc.
- The Financing Operations Act (*Lag om finansieringsverksamhet, 1992:1610*). This Act establishes the licensing requirements, the sound operations requirements, the operating regulations and the prudential regulations for institutions engaged in financing operations.

¹ 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.

² Council Directive 82/298/EEC coordinating the requirements for the drawing-up, scrutiny and distribution of the prospectuses to be published when transferable securities are offered to the public.

³ Council Directive 93/22/EEC of 10 May 1993 on investment services in the securities field.

- The Companies Act (*Aktiebolagslagen, 1975:1385*). This Act regulates public limited companies and shareholdings and is applicable to the above-mentioned financial institutions.
- The Act on Cross-Border Payments within the EEA (*Lag om betalningsöverföringar inom Europeiska ekonomiska samarbetsområdet, 1999:268*). This Act is based on the EC Directive on cross-border credit transfers⁴ and covers payments from individuals or legal entities in Sweden to individuals or legal entities in another EEA country, as well as payments from payers in an EEA country to payees in Sweden. The Act covers payments up to the amount of EUR 50,000.
- The Act on Fees on some Cross-Border Payments (*Lag om avgifter för vissa gränsöverskridande betalningar, 2002:598*). This Act is based on the EC Regulation⁵ on cross-border payments in euros. The Regulation can also apply to cross-border payments made in the currency of another member state, as has been decided in Sweden.
- The Deposit Guarantee Act (*Lag om insättningsgaranti, 1995:1571*).
- The Act on Measures against Money Laundering (*Lag om åtgärder mot penningtvätt, 1993:768*).
- The Act on Capital Adequacy and Large Exposures concerning Banks and Securities Firms (*Lag om kapitaltäckning och stora exponeringar för kreditinstitut och värdepappersbolag, 1994:2004*).
- The Act on Foreign Exchange Transactions and Payment Transfers (*Lag om valutaväxling och betalningsöverföring, 1996:1006*).
- The Cheque Act (*Checklagen, 1932:131*).
- The Consumer Credit Act (*Konsumentkreditlagen, 1992:830*).
- The Bankruptcy Act (*Konkurslagen, 1987:672*).

1.1.3 The Swedish banking sector

At the end of March 2002 there were 127 banks in Sweden. These banks can be divided into two categories: commercial banks, including branches of foreign banks, and savings banks. The Banking Business Act contains general provisions which apply to banks in the form of limited companies as well as to traditional savings banks.

Commercial banks dominate the banking sector, as most of the larger savings banks and all cooperative banks have merged and/or been transformed into commercial banks. In March 2002 more than 97% of total banking sector assets were held by commercial banks. The remaining 3% were distributed among 77 independent savings banks, most of them very small and locally oriented. Consequently, these banks play a very marginal role in the Swedish banking and payment system.

The banking sector is highly concentrated, with the four largest commercial banks (SEB, Handelsbanken, Nordea and FöreningsSparbanken) accounting for almost 56% of household lending, almost 77% of corporate lending and an even higher percentage of payment activities. In addition to being the major counterparties in the RIX system, these four large banks are also the majority owners of BGC and VPC.

Foreign banks are allowed to operate in Sweden through branches as well as subsidiaries. At the end of March 2002 there were 23 foreign banks represented on the Swedish market, 21 through branches and the other two through subsidiaries. The foreign banks accounted for around 13% of both household and corporate lending. This share has increased rapidly over the past few years.

In recent years there has been intense and sometimes indignant public debate about the banks' pricing policy, which is clearly aimed at introducing specific charges for various services in place of

⁴ Directive of the European Parliament and of the Council of 27 January 1997 on cross-border credit transfers (97/5/EC).

⁵ Regulation of the European Parliament and of the Council of 19 December 2001 on cross-border payments in euro (2560/2001).

float financing. This pricing strategy is also an important part of the banks' aim to encourage customers to make their payments via the internet or other electronic media.

1.2 The role of the central bank

1.2.1 General responsibilities

Statutory responsibility

With the exception of its explicit and exclusive mandate to issue banknotes and coin, the Riksbank's responsibilities in respect of the payment system and its various components are formulated in general terms in the Riksbank Act. For example, the Riksbank's role as an overseer of the payment system does not include any formal obligation to provide settlement services to the banks, but allows for this possibility. The Riksbank does indeed provide interbank settlement facilities for banks, the government and a few other financial institutions through the RIX system, as well as providing deposit and credit facilities.⁶ Via their accounts in the RIX system, the participants can borrow against collateral both intraday and overnight: intraday to ensure a smooth flow of payments, or overnight in the context of monetary policy.⁷

Oversight

The Riksbank's interpretation of its oversight responsibility⁸ can be described as being based on the following three aspects of the payment system:

- infrastructure
- central companies and institutions
- regulations

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. Subsequently, the oversight is focused on systemically important payment systems, ie the RIX system, the VPC and Stockholmsbörsen.

Retail payment systems are, however, also included in the Riksbank's oversight responsibilities, particularly those systems directly linked to RIX. In the field of retail payments the Riksbank pays particular attention to questions of efficiency in order to encourage the adoption of efficient payment solutions.

In performing its duties as an overseer, the Riksbank meets on a regular basis with different groupings of actors in the Swedish payment system. Individual meetings are held on a regular basis with the major banks, the Swedish Bankers' Association and the clearing organisations. The Riksbank can propose new laws and changes to existing laws directly to parliament, and is also asked to comment on new laws and various official reports. In addition to these activities, the Riksbank takes part in public debate on issues relating to payment systems. One important tool in the oversight activities of the Riksbank is the publication of the semiannual Financial Stability Report.

⁶ For more information about the participants' access to the Riksbank's deposit and credit facilities, see Section 3.2.2.

⁷ The Riksbank is allowed to grant intraday credit in euros, but not overnight credit.

⁸ The Riksbank's objectives and tasks with respect to the oversight of the financial infrastructure have been published in the Sveriges Riksbank Economic Review 2001:3.

The provision of an interbank settlement system

The rules and regulations to be followed by the participants in the RIX system are laid down in the Rules and Regulations for Payment Settlement in RIX (see Section 3.2.1) and in the agreements which the participants conclude with the Riksbank in its capacity as holder of accounts and owner of the system. Each participant enters into three different agreements with the Riksbank: an accession agreement, an agreement on credit and deposits and, finally, a pledge agreement for credit in RIX.

1.2.2 Ongoing work

The Riksbank takes part in various international committees and working groups, primarily organised by the BIS and the ECB, the activities of which are related to payment and securities settlement systems issues, such as the Committee on Payment and Settlement Systems and the Payment and Settlement Systems Committee.

During autumn 2000 the Riksbank initiated a domestic Payment Systems Committee, *Betalningssystemrådet*, consisting of executive representatives from the larger banks and clearing and settlement organisations in Sweden. This Committee is intended to serve as a forum for the discussion of payment systems issues at a general policy level.

In addition to the Payment Systems Committee, the Riksbank has set up a number of user groups and working groups which provide a medium for exchanging information with participants and for continuing with the development of the RIX system.

1.3 The role of other private and public sector bodies

Finansinspektionen

Finansinspektionen is the single Swedish financial supervisory authority. Finansinspektionen is responsible for the supervision of companies operating in the insurance, credit and securities markets. This includes the supervision of all clearing organisations, except for the RIX system, which is operated by the Riksbank. Contributing 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 Swedish Bankers' Association

In the private sector, the Swedish Bankers' Association, *Svenska Bankföreningen*, has standing committees which discuss and coordinate the banks' approaches to issues concerning the processing of payments and the technical aspects of payment systems. Within the framework of the Swedish Banker's Association, the participants enter into agreements with one another about cutoff times and the processing of payments in the RIX system. The Association is also owner of one of the retail payment systems in Sweden, the Data Clearing System, which is operated by BGC.

In the public sector, there are a number of authorities in addition to the Riksbank which are involved in various aspects of the payment system. These are as follows:

The Swedish Competition Authority

The Swedish Competition Authority, *Konkurrensverket*, was founded in 1992 and a new Competition Act came into force on 1 July 1993. This Act is based on the competition rules of the European Community and has two prohibitions, one against anticompetitive price collusion, the other against the abuse of a dominant position. It also contains provisions regarding merger control. The prohibition against anticompetitive price collusion has in some cases led to changes in the pricing of different retail payment services.

The Swedish Consumer Agency

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 Office

The Swedish National Debt Office, Riksgäldskontoret, is an agency reporting to the Ministry of Finance and is responsible for managing the national debt. The National Debt Office participates in the RIX system as the government agency responsible for the processing and management of government payments.

2. Payment media used by non-banks

2.1 Cash payments

Cash payments still account for a very large share of total payment transactions in the Swedish economy, although there are no firm statistics available to determine the precise figure. The ratio of the outstanding stock of banknotes and coin to GDP is about 4%.

The availability of cash has increased over the past decade as a result of the growing number of ATMs, from 2,221 in 1991 to 2,617 in 2000. Although there are two different brands of ATM, there is only one 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 one another. Individuals can thus make withdrawals, without charge, at any branch of any bank or at any ATM, irrespective of the bank at which the account is held.

In 1999 the Riksbank decided to delegate its operational involvement in the distribution of banknotes and coin throughout the country to a wholly owned separate subsidiary called Pengar i Sverige AB (PSAB). This decision was made on the basis of efficiency considerations. It was felt that costs arising from cash distribution could be cut in a number of areas, but that such cost reductions were more likely to be pursued by a profit-driven enterprise than by a public entity. PSAB is not restricted to doing business only with the Riksbank, and recently entered into an agreement with a Swedish bank to take over part of that bank's internal distribution and the counting and handling of banknotes and coin. However, the Riksbank has supervisory authority over PSAB. It also retains its overall oversight responsibility for the market for cash payments. This refinement of roles - operational versus oversight roles - is also expected to contribute to the realisation of efficiency gains. Furthermore, the Riksbank recently decided to divide PSAB into two companies at the beginning of 2003 in order to further enhance efficiency. Business that is exposed to competition will be organised in one company, which is to be sold.

2.2 Non-cash payments

2.2.1 Credit transfers

The bulk of non-cash payment transactions by companies and households are made through the two giro systems, the Postgirot and the Bankgirot. The two giro systems play a dominant role in the Swedish payment system, covering a wide range of transactions for both households and companies; the vast majority of Swedish enterprises and organisations hold accounts with both systems. Giro services are generally included in the package of services which banks offer their customers - households and enterprises alike - when they hold a bank account. In 2000 these two systems for credit transfers together accounted for 71% of all non-cash transactions. In value terms, around 86% of these transactions were generated electronically, while the remainder were paper-based.

The Postgirot system is an in-house system for credit transfers between accounts held at the Postgirot Bank. A total of 454 million transactions were carried out in 2000, which in aggregate amounted to SEK 4,086 billion (USD 391 billion) in value terms. The Postgirot Bank was recently purchased by Nordea.

The Bankgirot system is a network for credit transfers between accounts held at the commercial banks. Funds are transferred between bank accounts by means of a giro number, which is not an account number but an address indicating a bank account. The Bankgirot is also an open interbank system for the processing of payments and payment information, ie a clearing house for retail

payments. The four major Swedish banks, together with four smaller banks, through BGC collectively own the system. However, after its purchase of the Postgirot Bank, the Swedish Competition Authority required Nordea to reduce its ownership in BGC from 27% to 10%. In 2000 the Bankgirot handled around 351 million transactions with a total value of SEK 3,733 billion (USD 357 billion).

A growing proportion of transactions in both systems are initiated electronically; as might be expected, this tendency is more pronounced for large-value transactions. Enterprises and organisations now submit their payment orders almost exclusively by electronic media, while households more frequently send their written payment orders by mail. However, even households are increasingly submitting their payment orders electronically by means of internet-based banking services. Both the Bankgirot and the Postgirot administer systems which can be used for credit transfers initiated electronically via the internet.

A number of credit transfers also go directly from bank account to bank account without the use of a giro number. These are channelled by the Data Clearing System, which was originally developed for cheque truncation. The Data Clearing System is also used when more rapid retail payment transfers are required. Account numbers and payment messages are transferred in accordance with a standardised format, which allows for straight through processing (STP). The Data Clearing System is owned by the Swedish Bankers' Association, but operated by BGC. Despite its name, the Data Clearing System is not a separate system but is completely integrated in BGC's technical platform. In 2000 a total value of SEK 1,348 billion (USD 129 billion) was transferred through the Data Clearing System.

2.2.2 Cheques

In recent years the number of cheque transactions has decreased substantially. Two million cheque transactions were conducted in 2000, with a total value of SEK 22 billion (USD 2.1 billion). There are a number of possible explanations for this development. One is the growing number of ATMs, which have made cash more easily available at any time of the day, thereby reducing the need for cheques as a payment instrument. A second reason is the growing importance of various EFTPOS systems, which, from a practical point of view, should make payment by card more attractive. A third factor, and probably the most significant, is the fact that Swedish banks have implemented a clear policy of reducing the number of cheque payments, because these are considerably more costly than alternative means of payment, such as card payments. To this end, one of the major banks introduced a rather high charge on all cheque transactions at the beginning of the 1990s. The other banks subsequently followed this example and also imposed heavy fees, with the result that the use of cheques has been drastically reduced.

In Sweden, all cheques are truncated, that is, the bank at which the cheque is cashed retains the physical document and the information is transmitted by electronic media to the drawee bank. The cheques are truncated in the Data Clearing System mentioned above. All cheques can be cashed at any bank branch irrespective of the bank on which they are drawn.

2.2.3 Direct debits

Direct debits, called *autogiro* in Sweden, still account for a rather limited share - around 8% - of the total number of non-cash transactions, although their importance is growing. Both the Postgirot and the Bankgirot systems provide direct debit services. The reasons behind the modest growth in the use of direct debits have yet to be examined. Swedish consumers may be reluctant to use a system where they have the feeling that they are losing control over their payments, although this is an unfounded fear. Another reason might be that the low prices for alternative payment methods mean customers have no incentive to use direct debits. Alternatively, banks may not have marketed the product effectively.

2.2.4 Credit and debit cards

The use of cards as payment media has increased gradually over time. From the available statistics it is fairly evident that traditional credit cards have never played a significant role in the Swedish payment system, and, moreover, that their significance has diminished over the past few years.

Instead, debit cards have gained in importance, most notably those debit cards linked to bank accounts. Such debit cards usually combine several functions: those of a debit card for EFTPOS as

well as paper-based transactions, an ATM card for cash withdrawals, and a credit card, to the extent that the bank account to which the card is linked has an overdraft facility attached to it. In addition, these cards are usually provided with a link to international card systems such as Visa or MasterCard, which also makes them useful for international travel.

A rapid structural transformation is taking place in the area of retail payments, with increasing automation as the main driving force. One important indicator of this transformation is the fast-growing number of EFTPOS terminals in shops and other points of sale. The number of terminals operated by the banks rose from 6,100 in 1990 to 87,133 in 2000. The number of EFTPOS transactions increased by more than 1,400% during this period.

Another development in this field has been the growing importance of various retailer cards over the past decade. The volume and value of transactions using these cards have risen considerably, as has the number of issuers. The growing importance of retailer cards in recent years can be partly explained by the technical development mentioned above; card payments have become cost-effective from the retailer's point of view and they eliminate the risk of theft and robbery associated with the handling of large volumes of cash. Retailer cards also open up new channels for marketing vis-à-vis customers.

2.2.5 Prepaid cards

There is one card-based scheme in operation - the Cash card - which is issued by three of the major Swedish banks. All three banks use the same Proton technology, but continue to compete with one another by issuing their own bank-specific Cash cards. Interoperability is ensured as all cash terminals accept cards issued by any of the four banks and all loading terminals can be used by cardholders regardless of the identity of the issuing bank.

A pilot scheme was initiated at the end of 1996, with the national rollout of the system taking place in 1998. In accordance with the results of the first evaluations of market responses, the banks decided to abandon the Cash card as a standalone product and to include the e-money application in the traditional bank cards, so-called multifunctional cards. In 2000, 2.9 million transactions were carried out with the Cash card with a total value of SEK 160 million (USD 15.3 million). The corresponding numbers for 2001 were lower, 1.5 million and SEK 76 million (USD 7.3 million). The average number of transactions per month increased by 84% between 1998 and 1999 but dropped by 31% in 2000 and by almost 50% in 2001. It is still too early to say whether Cash cards are likely to gain widespread acceptance, but acceptance among customers has been rather low up to now. Retailers, however, have been receptive to the scheme, and there are currently 47,000 terminals that accept Cash card payments.

2.3 Recent developments

Internet banking has expanded very rapidly in Sweden. All banks offer internet services, which include access to account information as well as the possibility of carrying out transfers between accounts, bill payments and online securities trading. According to banking statistics, 20-25% of the private customer base has begun to use online banking services on a regular basis.

Bill payments still account for the largest proportion of online activity and the four largest banks have also begun to offer online bill presentment. There are two systems. However, there is an agreement in place for linking the two schemes and making them interoperable. Mobile phone banking is the next stage of online banking development. Some of the banks have already begun to offer mobile phone banking services to their customers. Pilot projects for initiating and making payments by mobile phone also exist outside the banking sector. Independent actors too are launching activities in this field on the Swedish market.

These trends may have some bearing on the future of the giro system in Sweden. It is now possible for private customers to initiate their bill payments electronically, and this may mean that the share of credit transfers initiated electronically will increase dramatically in the future. Furthermore, transfers between accounts at different banks have become easier as a result of online banking.

3. Interbank exchange and settlement systems

3.1 General overview

The RIX system, the settlement system owned and operated by the Riksbank, is the hub of the Swedish payment system. The system, developed during 1988-90 and implemented in 1990, operates on an RTGS basis. The RIX system settles payments in both Swedish kronor and euros. Until 31 December 1998, the system was used exclusively for Swedish kronor. Even though Sweden is not fully participating in EMU, the RIX system was adjusted to handle euro payments as well when the member states participating in EMU introduced the euro as a common currency on 1 January 1999. The RIX system therefore consists of two parallel but separate systems, K-RIX for settlement in Swedish kronor and E-RIX for settlement in euros.

The two main systems for retail payments are the Postgirot and Bankgirot systems. The Postgirot is essentially an in-house system for credit transfers between accounts held at the Postgirot Bank, recently purchased by Nordea. It handles payments ranging from low-value payments to and from households and firms to large-value government payments. The Bankgirot is an ACH managed by Bankgirocentralen (BGC) and owned by the banks. It is an open payment system in which customers can transfer payments from an account with one bank to an account with another bank. The Bankgirot system mainly handles retail payments, but also processes certain large-value payments. Bankgirot payments are settled on a bilateral net basis in the RIX system.

3.2 RIX

3.2.1 Rules of the system

Via E-RIX, the RIX system is linked to the ESCB's TARGET system. The rules for the TARGET system are issued by the ECB. On the basis of the ECB's TARGET Guideline⁹ and the multilateral agreement on TARGET¹⁰ concluded between the ECB and the NCBs of the European Union, the Riksbank has implemented the provisions of the Guideline and the multilateral agreement at the national level. The national regulation for Sweden is stated in the "Rules and Regulations for settlement of payments in RIX". Rules for the settlement of payments in Swedish kronor, which takes place in K-RIX, are also included in these rules and regulations.

There are three agreements between the Riksbank and the participant: (a) an accession agreement, (b) an agreement on credit and deposits, and c) a pledge agreement for credit in RIX. The agreements are appended to the "Rules and Regulations for settlement of payments in RIX", which are publicly available.

3.2.2 Participation in the system

The Riksbank owns and operates the RIX system. In order to be a participant in the RIX system, an institution must be authorised by the Riksbank. The RIX system is open to the following categories of institutions:

- credit institutions;¹¹
- investment firms (provided that they are permitted to trade in financial instruments or to provide guarantees in connection with issues of securities, and are counterparties in the Riksbank's money market operations);

⁹ Guideline of the European Central Bank of 26 April 2001 on a Trans-European Automated Real-time Gross settlement Express Transfer system (TARGET Guideline) (ECB/2001/3).

¹⁰ Agreement on a Trans-European Automated Real-time Gross settlement Express Transfer system (TARGET Agreement).

¹¹ According to the EU definition, which includes a number of institutions that are regarded as investment firms according to Swedish legislation.

- clearing organisations; and
- government agencies (which are responsible for central government payments and cash management).

The RIX system is open to remote access participants, and the Riksbank may also accept a foreign central bank as a participant in K-RIX. Participation in E-RIX is restricted to institutions which have their head office or a branch within the EEA.

In addition to the harmonised rules for the national payment systems in TARGET, each institution needs to fulfil certain prerequisites to participate in the RIX system, such as having sufficient technical, administrative and financial capacity in order not to cause disruptions in the RIX system. The institutions must also have access to SWIFT.

In mid-2002 K-RIX had 20 participants, including the Riksbank. Of these, 14 were banks, including six branches of foreign banks. The other institutions were BGC, VPC, Stockholmsbörsen and the Swedish National Debt Office. A mortgage institution, SBAB, became a participant in 2000 and one foreign credit institution has been accepted as a remote access participant in K-RIX. The foreign credit institution will become a participant in K-RIX in 2003.

In addition to the Riksbank, 14 of the participants in K-RIX also participated in E-RIX. Of these, 10 were banks, three of which were branches of foreign banks. The other institutions were BGC, VPC, Stockholmsbörsen and the Swedish National Debt Office.

Participants which are members of both K-RIX and E-RIX have two separate accounts, one for each currency. A credit facility can be attached to the accounts of participants which are credit institutions, securities firms or government agencies.¹² The Riksbank can grant intraday credit and overnight credit in Swedish kronor. The Riksbank's capacity to provide participants with credit in euros is, however, limited to intraday credit of a total amount of EUR 500 million (USD 463 million). Remote participants can have an intraday facility in Swedish kronor, but not in euros.

Participants can make payments on behalf of other institutions, and some smaller banks use this type of arrangement. For instance, most savings banks use FöreningsSparbanken (Swedbank), which acts as their clearing bank in the RIX system.

3.2.3 Types of transaction handled

The RIX system 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 coin, are also settled via the RIX system.

An individual payment can be registered and subsequently settled at any time during the operating hours of the system. From the point of view of the Riksbank, there is no minimum amount for the settlement of individual payments. However, under an agreement between the participants in the K-RIX system, the minimum amount for individual payments, such as interbank payments and customer-related payments, is currently SEK 0.5 million (approximately USD 50,400). Payments below this amount are aggregated and settled at predetermined times.

Bilaterally aggregated payments are divided into the following three categories:

- foreign payments (settlement of the SEK leg of payments to/from abroad which are to be forwarded to another bank in Sweden);
- 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 coin, etc).

For each category, settlement takes place on one or several occasions per day.

¹² A government agency can only be granted intraday credit. A clearing organisation cannot be granted either intraday or overnight credit.

The clearing and settlement organisations VPC and Stockholmsbörsen net the payment obligations multilaterally between the participants in the RIX system. The participants are responsible for sending payments prior to the agreed cutoff times and ensuring that sufficient liquidity is available on their accounts at that time. VPC and Stockholmsbörsen are responsible for the execution of the settlement. BGC's settlement of cash transaction withdrawals at ATMs is also carried out on a multilateral net basis.

For the settlement of aggregated payments, the related payment messages for the individual transactions are transmitted separately outside the RIX system via SWIFT or BGC.

In E-RIX, the participants can send cross-border and domestic payments in euros. The majority of the payments in euros are cross-border, transmitted via TARGET to the NCB with which the receiving bank has an account. Customer-related payments are rarely sent via the E-RIX system, since the Swedish banks primarily use the Euro Banking Association's Euro 1 system for customer-related payments.

3.2.4 Operation of the transfer system

The RIX system, which was implemented in 1990, operates on an RTGS basis. This means that payments are settled 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 whenever the system is open.

The RIX system operates on a mainframe computer and is developed, owned and operated by the Riksbank. The Riksbank runs the central computer system, and the RIX participants use their own equipment in their respective offices.

Communication via the RIX system is based on the SWIFT messaging system (see also Section 3.2.5).

The RIX system has a queuing function, which stores the participants' payments in a queue when there is insufficient liquidity. The payments are settled automatically when liquidity is available. This function applies the first in, first out (FIFO) principle, ie the first payment in the queue is settled first. RIX participants can depart from the FIFO principle by changing the order of the payments in the queue.

Net settlement transactions referred to VPC and Stockholmsbörsen are processed in separate queues and are settled at agreed cut-off times.

Participants can keep track of their transactions and the status of their Riksbank accounts at all times via a dedicated, encrypted online connection.

The opening hours for K-RIX are from 7 am to 5 pm each working day. The opening hours for E-RIX are from 7 am to 6 pm every day except for Saturdays, Sundays and a few public holidays when TARGET is closed.

3.2.5 Transaction processing environment

As mentioned above, communications via the RIX system are made by means of the SWIFT messaging system. Since 1998 the RIX system has used a SWIFT service called SWIFT Fincopy which stores payment messages and forwards them to the recipient once settlement has been made. The messaging technology allows participants to send payment instructions directly from their own systems. Payments can be processed automatically, which facilitates the continuous settlement of payments throughout the day.

If a bank suffers a disruption, it can manually enter transactions into the RIX system via RIX online. It is also possible to fall back on the Riksbank's former online system for sending and receiving payments in case of a disruption in the SWIFT network or the communication system.

The Riksbank has backup computer facilities located at physically separate sites of operation. Communications to the computer facilities are duplicated and all production data are updated in real time. If a breakdown in operations should occur, a transfer to the RIX backup system can take place within two hours.

3.2.6 Settlement procedures

As mentioned in Section 3.2.3, the participants in K-RIX have agreed on a certain settlement schedule for bilaterally and multilaterally aggregated payments, while the settlement of individual payments, such as interbank and customer payments, can take place whenever the system is open. E-RIX has only a few cutoff times for the settlement of aggregated payments.

3.2.7 Credit and settlement risk

The RIX system is an RTGS system. Since there is no delay between the system's acceptance of a payment and final settlement, the credit exposure is eliminated. Furthermore, the system does not send a message to the receiving bank until settlement is final. There is therefore no possibility for the receiving participant to credit its customer before final settlement.

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

To avoid the possibility of liquidity shortage in the system, the participants are allowed to borrow intraday liquidity. Since 1 January 1995 full collateral has been required for both intraday and overnight borrowing.¹³

Collateral is marked to market daily, and both initial margin and haircuts are used as risk control measures. The qualification requirements for securities used as collateral include rating and listing requirements. Neither collateral issued by banks nor collateral issued by an entity with close links to the participants is accepted. Collateral, in the form of a pledge, can be held at the domestic CSD, VPC, at Euroclear or at the Danish and Norwegian CSDs, with the respective central bank acting as counterparty.

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.

Separate rules for collateral apply in part to credit in euros. Credit in euros is not available to remote participants.

3.2.8 Turnover

During the first three quarters of 2002 the number of transactions in the K-RIX system averaged around 4,200 per day, with a daily turnover of about SEK 450 billion (USD 45,3 billion). The average amount of collateral was about SEK 70 billion (USD 7.1 billion). The number of transactions has increased during the last year. The main reason for this increase is that larger payments in the foreign clearing process are settled individually rather than in the aggregated settlement.

The number of transactions in the E-RIX system averaged around 300 payments sent and about 600 received per day at the beginning of 2002, and the daily turnover of payments sent was some EUR 5.5 billion (USD 5.1 billion).

3.2.9 Pricing

The Riksbank's pricing policy for the RIX system operates under three restrictions:

- to minimise risk and unwanted behaviour by participants,
- to attain full cost recovery, and
- to promote fair competition.

The price list below shows the fees for participation in the RIX system in 2002:

¹³ The Riksbank can grant intraday and overnight credit in Swedish kronor, but only intraday credit in euros.

| Fees in 2002 | K-RIX | | E-RIX | |
|---|-------------------|--------------------|----------------------|--------------------|
| Annual fees | | | | |
| Participants | SEK 200,000 | (USD 20,155) | SEK 290,000 | (USD 29,224) |
| Clearing houses | SEK 150,000 | (USD 15,116) | SEK 240,000 | (USD 24,186) |
| Transaction fees for domestic payments | | | | |
| 1-420 payments/month | SEK 9 | (USD 0.91) | SEK 9 | (USD 0.91) |
| 421-10,000 | SEK 3 | (USD 0.30) | SEK 3 | (USD 0.30) |
| 10,001+ | SEK 1 | (USD 0.10) | SEK 1 | (USD 0.10) |
| Transaction fees for TARGET payments | | | | |
| 1-100 payments/month | – | | €1.75 | (USD 1.62) |
| 101-1,000 | – | | €1.00 | (USD 0.93) |
| 1001+ | – | | €0.80 | (USD 0.74) |
| Intraday liquidity in euros | | | | |
| Fee for intraday liquidity | – | | 10 basis points, EUR | |
| Excess reserve data link | SEK 30,000 | (USD 3,023) | SEK 30,000 | (USD 3,023) |
| New member in the RIX system | | | | |
| Entry fee ¹ | SEK 75,000 | (USD 7,558) | | |

¹ Not specific for K-RIX or E-RIX.

3.3 Retail payment systems

3.3.1 The Postgirot

The Postgirot is essentially a system for credit transfers between accounts held with what is now the Postgirot Bank, recently purchased by Nordea. The Postgirot system handles all kinds of transactions, both low-value payments to and from households and large-value government payments.

Households make extensive use of the Postgirot system, partly as a result of the cooperation agreements that exist between some of the banks and the Postgirot system. Nordea, one of the largest commercial banks, has established links between its system for handling salary payments to government employees and the Postgirot system. In addition, the savings banks have a large number of salary accounts linked to the Postgirot system. The fact that all post office branches in the country can handle transactions, and that they have longer opening hours than the banks, has of course contributed to the popularity of the system.

The Postgirot Bank has customer relations with households, companies and other banks which use the Postgirot Bank's services. Banks are charged according to specific arrangements between the bank in question and the Postgirot Bank. With regard to households, companies and organisations, the Postgirot Bank has price lists containing information on fees for the different services it offers.

Since 1986 the Postgirot system has been a member of the SWIFT network for international transactions. At the beginning of the 1990s the Postgirot was integrated into Euro-giro, the European network for postal giro systems for the handling of cross-border payments.

In 1999 the Swedish government decided to sell the Postgirot Bank. The four major banking groups in Sweden announced their willingness to jointly acquire the whole stock of accounts held by the Postgirot Bank. Their intention was to merge the Postgirot and the Bankgirot systems. However, the Swedish Competition Authority decided against this merger on the grounds that it would lead to the creation of a private monopoly. Instead of the joint takeover, one of the four major banking groups, Nordea, acquired the Postgirot Bank. The Postgirot Bank has recently become a full member of the Bankgirot system.

3.3.2 The Bankgirot

The Bankgirot system is mainly used for credit transfers between bank accounts. By contrast with the Postgirot system, there are no separate Bankgirot accounts; instead, ordinary bank accounts are given

a Bankgirot number. In other words, the Bankgirot system is an “open” payment system in which customers can transfer payments from an account with one bank to an account with another bank. The Bankgirot is an ACH managed by BGC and owned by the banks. 20 banks are currently affiliated to it. BGC manages and develops the Bankgirot system and offers its products and services to the banks on a purely subcontractual basis. A wide range of information services relating to the processing of payments is included in the services offered to banks.

The Bankgirot system mainly handles retail payments, but also processes certain large-value payments. Bankgirot payments are settled on a bilateral net basis in the RIX system, whereby payment orders between each pair of banks are calculated to a net debit or credit position. These net balances are registered in the banks’ accounts at the Riksbank for settlement during the day. If one participant has liquidity problems at the time of settlement, the payment is put in a queue. The transaction is queued for no longer than 30 minutes; if the bank is still unable to settle its net position after this period, the net position is recalculated as a pair of gross payments. In this way, a bank’s liquidity problems do not hinder a counterpart from settling its own obligations. Different types of payment have different settlement schedules throughout the day. After settlement, the underlying payments are sent to the receiving bank by file transfer.

The Bankgirot system differs from the Postgirot system in that it only has customer relationships with the banks. These banks, whether they are shareholders of BGC or not, are charged at cost. Banks face a combination of fixed transaction fees and variable fees that decrease with the volume of transactions conducted.

Partly in response to the rapid development of electronic payment delivery and processing technology, such as internet payment services, and after discussions with the Riksbank, BGC adopted in 1999 a new technical platform and new clearing procedures. The development of the new clearing platform has led to the full integration of all systems involved in the clearing and settlement cycle, namely the RIX system, BGC’s clearing information system and the clearing participants’ internal systems. There have been two additions to the existing communication channels: a new internet-based information channel and a new interface between BGC and the clearing participants. These allow the participants to follow their clearing positions in real time via the internet. The system handles two types of clearing and settlement methods: bilateral gross and net clearing and settlement. It has several clearing and settlement cycles per day, one or more for each category of payment. The number of payment services processed by the new platform is gradually increasing. The clearing and settlement of banks’ cash transactions through PSAB, which was previously carried out by the Riksbank, has been included in the range of services provided by the new BGC system. Also the Data Clearing System has been integrated into BGC’s new technical platform.

3.3.3 Credit and debit cards

The vast majority of credit and debit card transactions - except for those relating to retailer cards - are channelled through specialised data processing companies. Domestic transactions with Visa-linked cards are cleared by Visa’s own system in London, while MasterCard/Europay-enabled transactions are cleared by Europay’s network in Brussels.

3.3.4 E-money schemes

There is one countrywide e-money scheme in operation, which utilises Proton technology. It is a card-based system run by three of the major Swedish banks in cooperation with one another. The cooperation between these banks covers technological development, marketing activities and brand administration. In addition to these aspects, each bank issues its own card with that bank’s own logo together with the joint brand name, “Cash”. However, the system allows for full interoperability in the sense that all vendor devices and loading terminals accept all Cash cards regardless of the identity of the issuing bank.

A central Proton collecting system run by one of the banks in the Cash association collects transactions stored at the POS terminals once a day. The system provides each acquiring bank with a clearing file of information on retailer accounts and the amounts with which these are to be credited. The clearing of transactions between issuing banks and acquiring banks is carried out in bilateral batches through the Data Clearing System run by BGC. According to the contract which regulates the Cash association’s activities, surviving Cash banks guarantee that merchants’ and cardholders’

e-money holdings shall be reimbursed in the event of bankruptcy on the part of either the acquiring or the issuing bank.

4. Securities settlement systems

4.1 Trading

4.1.1 Institutional and legal aspects

The Swedish securities market comprises the equities and derivatives exchange, the money and bond market, and OTC derivatives. Equities, bonds and money market instruments are all dematerialised in the VPC system, which also handles the clearing and settlement of these instruments, while Stockholmsbörsen clears and settles derivatives. (Stockholmsbörsen and VPC are described in more detail in Sections 4.2 and 4.3 respectively.)

Finansinspektionen is responsible for the authorisation and supervision of exchange and clearing and settlement organisations (see Section 1.3). Sveriges Riksbank has an oversight role.

The Swedish securities markets have been consolidated in the past few years as a result of two mergers which occurred in 1998. Stockholmsbörsen was established by the merger of OM's derivatives exchange - OM Stockholm - and the Stockholm Stock Exchange. In the same year, Stockholmsbörsen acquired Penningmarknadsinformation Pml AB (Money Market Information), which it now operates as OM Fixed Income Exchange. Stockholmsbörsen is owned by OM AB, a privately owned company listed on Stockholmsbörsen.

The trading of stocks and derivatives and, since 2001, inter-dealer trading in some government bonds take place on electronic trading platforms offered by Stockholmsbörsen. Stockholmsbörsen has a trading system, called SAXESS, for trading equities and bonds. Only exchange members are allowed to trade in the SAXESS system. Prospective members must be authorised by Finansinspektionen or a home country supervisor. Furthermore, they must have equity of at least SEK 6.8 million (USD 650,465) and at least two employees who meet the standards set for a trader for trading via SAXESS. In order to be authorised as a trader in the SAXESS system, an employee must have at least six months' experience in securities trading in a member firm, a documented satisfactory knowledge of stock market legislation, economics, financial markets and financial analysis, and have passed the SAX training course.

In the first quarter of 2002, members included 32 Swedish banks and securities firms, seven foreign branches in Sweden and 42 remote members, ie without a presence in Sweden.

In May 2001, Stockholmsbörsen started up an electronic market for inter-dealer trading in government benchmark bonds. Since the beginning of 2002, the market has been handling all trading in 10-, five- and two-year government benchmark bonds. At present, 50% of all trading in government bonds takes place on the electronic market. Membership is limited to dealers who are market-makers and these must trade in these bonds exclusively on the electronic market. There are currently seven such members. Trading is carried out in the SAXESS system and is market-maker-driven. The Swedish National Debt Office issues all of its debt instruments directly into the electronic marketplace, even those instruments which are not traded electronically. Stockholmsbörsen also has an electronic trading system, called SOX, designed for trading bonds and money market instruments among smaller and medium-sized investors.

In addition to the two exchanges, there are two other authorised marketplaces offering trading facilities, AktieTorget AB and Nordic Growth Markets AB. They both offer a primary and a secondary market for relatively small companies with growth potential. AktieTorget cooperates with Stockholmsbörsen and uses the SAXESS trading system, while Nordic Growth Markets AB uses a different system called Tellus.

Legal basis

Trading is mainly regulated by the Exchange and Clearing Operations Act and the Trading in Financial Instruments Act.

Basic quantitative aspects

The market value of the shares listed on Stockholmsbörsen amounted to SEK 2,856 billion (USD 273 billion) at the end of 2001. The value of all transactions conducted in 2001 was SEK 3,994 billion (USD 382 billion). The number of equity transactions totalled 10,628,000 during 2001.

The turnover in value terms of dematerialised securities is much higher in the money and bond market than in the equity market. The outstanding nominal value of money and bond market instruments as of December 2001 amounted to SEK 1,719 billion (USD 164 billion), while the transaction value stood at SEK 42,756 billion (USD 4,088 billion).

4.1.2 Operational aspects

Stock and derivatives market

Since 1999 trading on Stockholmsbörsen's exchanges has been based on the computerised trading system, SAXESS. Trading is conducted by traders who operate from their own offices via PCs connected to the SAXESS computer at Stockholmsbörsen. The institutional and operational aspects of using the computerised trading system for small-value bond and money market trades, SOX, are similar to those involved when trading equities. Trading in SOX is carried out through the SAXESS system, and the following description therefore also applies to this type of fixed income trading. The instruments traded include shares, bonds, premium bonds, convertibles and fixed interest securities.

SAXESS trading in the equity market is order-driven. Bids and offers are automatically matched to generate deals when price, volume and other order conditions are met. Trade orders are executed according to price and time priority. For very large trading lots, deals may be made by telephone, but have to be entered manually into the SAXESS system.

Information about changes in the market is continuously broadcast. The information is displayed in real time in the form of order books, market summaries, concluded deals, index information and reports of various kinds. All traders receive the information at the same time. Traders can thus enter their orders without having to be in personal contact with the other party. At the same time, they gain an instant overview of the market situation.

Most trading takes place in the trading lot market, where shares are traded in lots. In order to maintain an efficient market for small orders as well, a specific odd lot market has been developed. The two markets are integrated in such a way that the remaining odd lot portion of a larger order is automatically moved to the odd lot market if the volume of the order falls below that of a trading lot.

Automatic matching in the odd lot market can only be performed at the last paid price in the trading lot market. Deals can also be generated between trading lot orders and odd lot orders. Before continuous trading begins, there is an opening pre-trade session during which the traders can enter limit orders. The order book is not revealed during this session. The total volume of orders in each security is accumulated and the opening price is set at the level at which most shares may be traded. Once trading for a specific share opens, continuous trading begins.

There are two ways of closing a deal in the SAXESS system: automatic matching and off-exchange registration. Automatic matching and off-exchange registration are used for all instruments traded in SAXESS. Off-exchange registration occurs when two parties agree the terms over the telephone. The trader must then report the deal to SAXESS within five minutes during the trading day, or no later than 15 minutes before the start of the next trading day if the deal is made after the close of SAXESS. The same rule applies to internal crossings. For shares with the highest turnover, orders of 500 trading lots or less must be traded within the spread. For other shares, orders of 250 trading lots or less must be traded within the current spread.

Currencies

Since 1999 trading on Stockholmsbörsen has been possible in two currencies, Swedish kronor and euros. Listed companies may choose the trading currency. There are three alternatives for listed companies - trading in Swedish kronor, trading in euros, or trading in both Swedish kronor and euros. In all cases, the registered share capital for Swedish companies remains in Swedish kronor.

Operating hours

On normal working days the system is open for trading between 9.30 am and 5.30 pm.

Risk management

In order to ensure a sound and transparent market, there is a membership agreement which governs members' obligations and listing agreements. The duties of Stockholmsbörsen include monitoring members' compliance with the agreement and ensuring that members act in a manner which fosters confidence in the securities market. The surveillance is carried out with the help of electronic systems which indicate abnormal changes in prices and volumes. Unsound, illegal or other misleading trading which contravenes existing trading rules or membership agreements is investigated and reported to Finansinspektionen.

Links to other systems

Stockholmsbörsen, the Copenhagen Stock Exchange, the Iceland Stock Exchange and Oslo Börsen have been joined together in a common trading system and have adopted common rules and regulations. Integration was effected within the framework of the NOREX Alliance, the ambition of which is to integrate the Nordic financial marketplaces.

Bond and money market

The bond and money market is organised as a dealer market, and the market-makers are authorised by the respective issuer. Primary dealers have the exclusive right to act as counterparties in the monetary operations of the Riksbank, but are at the same time obliged to be market-makers in those securities in which the Riksbank trades. A prerequisite for being accepted as a primary dealer is the authorisation of the applicant as a market-maker in government securities by the Swedish National Debt Office. A basic requirement is the authorisation by Finansinspektionen to act as a dealer or, in the case of foreign companies, the authorisation by a corresponding authority in their home country.

As of December 2001, six banks and one security firm were authorised as primary dealers.

On the bond and money market the market-makers supply the liquidity at each given moment in time. The market-makers compete for investors' orders by quoting prices at which they will buy and sell. Customer trades are not made directly with another customer; instead, all trades are made with the market-maker as a counterparty. Government benchmark bonds with two-, five- and 10-year maturities are now traded electronically between market-makers on Stockholmsbörsen's electronic exchange (for a description, see Section 4.1.1).

4.2 Clearing**4.2.1 Institutional and legal aspects**

Stockholmsbörsen is the only clearing organisation in Sweden which acts as a central counterparty in the transactions which are cleared. Stockholmsbörsen is a wholly owned subsidiary of the listed company OM AB. By the end of 2001 the Swedish state owned close to 10% of the capital and voting rights. The shareholdings of the four largest Swedish banks totalled about 11% of the capital and voting rights. In addition to its clearing house function, Stockholmsbörsen is also an exchange, as described in Section 4.1.

Stockholmsbörsen is a private company incorporated in Sweden under the Companies Act and is an authorised exchange/clearing house operating under the Exchange and Clearing Operations Act. It is supervised by Finansinspektionen, which has established a regulatory framework for the exchange's clearing and settlement system.

Clearing membership of Stockholmsbörsen is open to institutions authorised to deal in securities according to the Securities Operations Act, or to equivalent foreign institutions, ie institutions supervised by Finansinspektionen or by a corresponding agency in their home country. The minimum capital requirement is SEK 10 million (USD 1,007,737), calculated as shareholders' equity after tax. There is only one type of clearing member. In March 2001, Stockholmsbörsen had 43 clearing members.

Stockholmsbörsen has a direct relationship with each customer, ie the owner of a clearing account. The customer acts in relation to Stockholmsbörsen through one of the clearing members who is the clearing account administrator. The identity of customers is not known to the exchange, only to the account holder and to a special control company, clearing company AB, a company owned by Stockholmsbörsen and the Swedish Securities Dealers' Association.

4.2.2 Operational aspects

When a transaction is accepted for clearing, Stockholmsbörsen becomes a counterparty to the parties involved, ie the seller to the buyer and the buyer to the seller. For transactions undertaken on the derivatives exchange, Stockholmsbörsen steps in as the central counterparty directly when the transaction is registered. A transaction is registered on a trading account of the customer carrying out the trade. The transactions are then integrated into a clearing account or connected to a separate clearing account administered by a member of the exchange.

Products

The clearing activity covers both derivative products traded on Stockholmsbörsen and products traded outside the exchanges. Stockholmsbörsen does not generally clear spot market transactions. However, in March 2002, a central counterparty service was set up covering transactions arising when the Swedish National Debt Office initiates new issues, buybacks and exchanges.

The following products are traded on the OM exchanges:

- futures and options on Swedish shares;
- futures and options on the Swedish share index;
- futures on Swedish government bonds;
- futures and options on Norwegian shares;
- futures and options on the Norwegian share index;
- futures and options for pulp;
- futures on the UK electricity market; and
- 10-, five- and two-year government benchmark bonds.

The following products are only cleared:

- futures on Swedish government securities and securities issued by Swedish mortgage institutions;
- futures on three-month forward rate agreements (FRAs);
- Swedish index swaps;
- standardised swap contracts;
- futures on currency; and
- tailor-made clearing contracts for fixed income and equity products.

Risk management

For all outstanding contracts there must be sufficient collateral pledged to Stockholmsbörsen. Collateral can be pledged either individually by each customer, or by the clearing member for both its own and its customer's obligations. Margin requirements are calculated at the end of each day, and additional collateral must be delivered before 11 am the following day. Stockholmsbörsen can also make intraday margin calls. A margin is calculated for each separate clearing account, but, within an account, potential covariance between positions and products is accepted.

Stockholmsbörsen accepts different types of assets as collateral, such as cash in 10 currencies, government securities from seven countries, certain other Swedish fixed income securities and certain Swedish, Danish, Finnish and Norwegian listed shares. Collateral is to be deposited with one of the custodian institutions accepted by the exchange, of which there were 11 in March 2002. Collateral is

held separately from Stockholmsbörsen assets. The total outstanding contracts or the total margin amount can be limited by monitoring the largest positions.

In the event of default by customers, Stockholmsbörsen has its own financial resources in addition to the collateral received from customers. These include some SEK 1.3 billion (USD 131 million) in shareholders' equity and subordinated debt, SEK 720 million (USD 73 million) in credit insurance and a credit facility for another SEK 1.5 billion (USD 151 million).

Contingency procedures have been established. Computer and communication facilities are duplicated on a real-time basis.

Connections to trading systems and settlement

Derivative transactions which are traded on Stockholmsbörsen are automatically transferred to the clearing system. Other transactions are fed into the system through interfaces with members' in-house systems.

All fund settlements (option premiums, variation margins, fees and maturing contracts) are made via Stockholmsbörsen's account in the RIX system on a multilateral net basis. Settlements take place on a daily basis. All clearing members which have an account with the RIX system in Swedish kronor or euros register their net debit or credit transactions in this account no later than 11.30 am. Clearing members who do not have an account in the RIX system act through a settlement bank. Stockholmsbörsen confirms these transactions at 11.45 am, at which time they are settled simultaneously and finalised. As a party to all transactions, Stockholmsbörsen guarantees settlement and replaces defaulting members in the settlement process.

Operating hours

Stockholmsbörsen's system is open for clearing registration from 8 am to 6.30 pm, and for trading from 9.30 am to 5.30 pm.

4.3 Settlement

4.3.1 Institutional and legal aspects

VPC AB is the only clearing and settlement organisation in Sweden operating an SSS - the VPC system - and providing the services of a CSD. The four largest Swedish banks own 98.6% of its shares and voting rights in equal parts. Minor banks and investment firms own the remaining 1.4%.

VPC is a joint stock company with limited liability incorporated in Sweden under the Companies Act. VPC is operated on a for-profit basis and is authorised and supervised by Finansinspektionen as a clearing organisation operating under the Exchange and Clearing Operations Act, as operator of a designated settlement system under the Settlement Systems Act and as a CSD under the Financial Instruments Accounts Act. VPC is also subject to oversight by Sveriges Riksbank.

Membership

Public rules on access and exit criteria are outlined in VPC's Rules and Regulations, which are available to participants and are posted on VPC's website. Clearing membership of VPC is open to institutions authorised to deal in securities according to the Securities Operations Act or similar foreign institutions, ie institutions supervised by Finansinspektionen or by a corresponding agency in their home country. In addition, Swedish and foreign clearing organisations and CSDs, as well as central banks, may become members. The capital requirements for financial institutions other than clearing organisations and CSDs are limited to the minimum capital requirements, including capital adequacy, according to the respective domestic regulation. For clearing organisations, CSDs and non-financial institutions participating in money market clearing, the capital requirement is SEK 1 billion (USD 95,621,491). In addition to capital requirements, there are organisational requirements. In the case of money market clearing, an indirect participant takes part in the clearing through a clearing member.

Clearing membership can be restricted to either stock market clearing or money market clearing, or can cover both. In addition, the RTGS functions are open to all clearing members. Clearing membership is divided into two categories: either Swedish kronor or euros, or both. In March 2002,

VPC had 45 clearing members, of which 43 participated in the guarantee clearing procedure (see below under the section entitled "Risk management") and 18 in the money market clearing procedures. All 45 members can participate in the RTGS clearing procedure.

Participation in the system

The participants in the VPC system are issuers, account operators, authorised nominees, clearing members, settlement banks and account holders. Issuers may issue shares, debt instruments, certain types of derivatives or other types of financial instrument. In December 2001, securities issued by 1,157 issuers were handled in the guarantee settlement cycle, a settlement procedure primarily for stocks (see description below). In the money market settlement procedure, there were securities issued by 120 issuers. Account operators are technically affiliated to the VPC system and are the only entities, apart from VPC itself, which are directly involved in entering book-entry registrations in the system. In general they represent the investors, although some account operators act on their own account only. In December 2001, there were 47 account operators, primarily banks and investment firms, but also a few issuers and large investors. Account operators are approved by VPC. The requirements are similar to those for clearing membership. For account operators, however, there are technical requirements, but no capital requirements. Investors can have their securities holdings registered either in an account opened in their own name in the VPC system (there are 3.8 million such accounts held by 3.5 million individuals) or under a nominee registration in a nominee account opened in the name of a nominee authorised by VPC.

Legal basis

The legal framework for the registration of dematerialised securities is found in the Financial Instruments Accounts Act. The finality of settlement is supported by the Swedish implementation of the EC Directive on settlement finality through the Settlement Systems Act.

4.3.2 Operational aspects

Settlement processes

There are three main clearing and settlement processes: real-time gross settlement, net settlement for the money market and net settlement for the stock market.

In the case of an RTGS process, cash is moved from the cash account operated by VPC to the seller's cash account at the Riksbank at the same time as the securities are moved from the seller's securities account to the buyer's securities account within the VPC system. The settlement is then final.

In net settlement processes, securities are registered and delivered gross, while payments are netted on a multilateral basis with the net amounts being reported. Settlement banks with a net payment obligation debit the amount from their own cash accounts and credit the cash account operated by VPC at the Riksbank. Securities and payments are then settled simultaneously and irrevocably at 12.45 pm. These net processes are run once a day. The settlement of euro transactions is carried out separately from the settlement of transactions in Swedish kronor, but in a similar way and at the same time.

One major difference between money market settlement and settlement for the stock market is that in the latter case there is no possibility of entering transactions on the settlement day. In the case of money market clearing, this possibility exists. The delivery capacity check starts at 1.15 pm on the day before the settlement day for money market clearing, while for stock market clearing this check is made continuously from the time at which the transaction is entered in the system by the account operator.

Cash settlement and delivery versus payment

Cash settlement is made in central bank money via Riksbank accounts in the RIX system. VPC clearing members who have no access to the RIX system must use a settlement bank which is a member of the RIX system. For each clearing procedure one net amount per currency is calculated for each settlement bank. This net amount includes payments for the settlement bank's own transactions as well as other clearing members' payments.

The cash settlement takes place at the same time as the settlement of securities, and DVP is thus achieved. The settlement immediately becomes final and irrevocable.

Links to other settlement systems

As of September 2002 VPC had direct CSD links to the Danish system, VP, for government bonds, the British system, Crest, for AstraZeneca shares, the Swiss system, SIS, for ABB shares and the Finnish system, HEX, for Swedish and Finnish securities.

Risk management

VPC is not a party to any transaction to be settled and does not offer any custody services. It does not offer any credit or stock lending facilities. The account it holds at the Riksbank is in the name of its customers and its balance should be zero after settlement has been executed.

All Swedish book-entry instruments are issued directly via VPC. For some foreign instruments, depositories are used. Depositories are highly reputable commercial banks (custodians).

In order to minimise the risk of insufficient funds, the guarantee clearing procedure contains a requirement that the stock market have a basic guarantee from a settlement bank for those clearing members not settling the cash leg in the RIX system. This basic guarantee is based on the historical average net settlement amounts. In addition, there should be a supplementary guarantee for amounts not covered by the basic guarantee. The basic guarantee may not be withdrawn with less than seven days' notice. The supplementary guarantee must be in place by 10 am on the settlement day.

In the event that there are not enough securities to cover all sales, transactions are cancelled. In this context, in the case of money market clearing, certain clearing members (in particular primary dealers) have been assigned special responsibilities to prevent further disturbances in the settlement process by covering their emerging shortages.

In the event of insufficient funds or a lack of a supplementary guarantee (in the case of guarantee clearing), all transactions by the defaulting participant (clearing member or indirect participant) are unwound and a delayed settlement routine is activated, whereby non-defaulting participants take over the failed trades. In the money market clearing procedure, the participants have an obligation to participate actively in this process through repos or securities lending transactions. The issuers also have an obligation to issue new securities, should this prove necessary.

Operating hours

VPC is open for registration and settlement (RTGS) from 7 am to 6 pm. Transactions may be entered outside these hours, but in such cases are not formally registered.

4.4 The use of the securities infrastructure by Sveriges Riksbank

4.4.1 Collateral management

The Riksbank uses the VP system to receive collateral for monetary policy and payment system credit operations, and as a correspondent for other central banks. The Riksbank previously used a valuation service provided by VPC for this purpose. This service was replaced in January 2001 by an in-house collateral information system, developed by the Riksbank.

4.4.2 Other uses of systems

The Riksbank registers its holdings of Swedish securities with VPC and uses VPC for settlement when carrying out operations directly related to monetary policy.

