



# The Swedish Financial Market

2007

S V E R I G E S R I K S B A N K





# The Swedish Financial Market 2007

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## ■ Preface

In publishing *The Swedish Financial Market*, the Riksbank is endeavouring to contribute to increased knowledge about the financial system and its functions. The publication is a description of the roles and functions of financial markets, systems and institutions in the Swedish financial sector. *The Swedish Financial Market* is published once a year and is largely based on annual statistics.

The publication is designed to serve a dual function, a “reference book” for those needing statistical information and a simple “text-book” for those who wish to learn more about Sweden’s financial system. This means that the publication is directed at a broad readership, ranging from professionals to students and members of the general public with an interest in the subject.

The description of the financial markets is divided into sections on the equity market, the fixed-income market and the foreign exchange market. In addition to an account of how trading takes place, there is a presentation of marketplaces and different types of instruments traded in these marketplaces, for example equities and bonds. A separate chapter is devoted to important financial institutions. These include banks, insurance companies, fund management companies, securities companies and private equity and venture capital companies. A separate chapter has also been included describing and explaining the special infrastructure used for payments and securities transactions in Sweden.

As the title indicates, the descriptions are confined to the Swedish financial sector. Today, since the activities of the financial companies are increasingly reaching across borders, this distinction is difficult to make. However, the report is built on national statistics compiled annually for financial institutions and this provides a natural set of Swedish parameters for the publication.

Stockholm, August 2007

Johanna Fager Wettergren  
Editor

## ■ Introduction

The financial system has three main roles: to convert savings into financing, to manage risk and to make it possible for payments to make payments efficiently.

### CONVERTING SAVINGS TO FINANCING

The need to convert savings into financing is manifested in many different ways. Households often need to smooth their consumption over life's different phases. When people are young, they may need to borrow money for investments in housing and education. Later in life, they will often have a greater need to save for pensions and consumption. At the same time, business projects require financing before they may become reality. They may in turn benefit society in the form of economic growth and employment.

The financial sector assists in channelling people's savings into investments as efficiently as possible. It would be inefficient if every saver had to seek out and analyse suitable business projects to invest in, and it would also be inefficient if every single entrepreneur had to seek out a large number of potential investors for his/her projects. All parties can benefit from the assistance of a specialised middleman, a *financial intermediary*.

The clearest example of a financial intermediary in this role is a bank. Savers who want to smooth their consumption evenly over their lifetime can deposit money in a bank account and withdraw it (plus interest) at a later stage. At the same time, the bank can lend the saver's money to businesses and households with a need for financing. Banks are specialists in valuing, monitoring and managing credit risks in the households and companies to which they lend. Banks could be said in this case to enable their customers to capitalise on *economies of scale*, while at the same time solving the saver's problem of *asymmetrical information*.<sup>1</sup> To get around the problem of asymmetrical information, it is enough for the borrower or entrepreneur to convince *the bank* of the creditworthiness of the entrepreneur or project. Similarly, savers do not need to determine the creditworthiness of every borrower; it is enough to be convinced that the bank can meet its obligations. The

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<sup>1</sup> Asymmetrical information arises when a lender does not have the information needed to take a rationally based decision on lending money to a borrower.



financial sector – in this simplified case, represented by a bank – thus contributes to more efficient allocation of capital in the economy. Other examples of financial intermediaries that contribute in this way are mortgage institutions and finance companies.

However, it is not always financial intermediaries that are the most efficient means of distributing financing. For example, financing can be provided even more efficiently by constructing standardised financial contracts that can easily be bought and sold in a market. This is called securitisation. Organised trading with clearly defined rules and a high degree of standardisation creates the conditions for effective pricing. When many participants monitor, analyse and trade in the instruments sold in the market, the overall level of information and transaction costs can be reduced. This, in turn, makes it easier to assess the value of the financial service, leading to better pricing. At the same time, the risk borne by investors decreases because day-to-day trading makes it easier to sell a holding.

Good examples of the successful securitisation of financial services are equities, bonds and money market instruments. In simplified terms, the *issuers* of bonds and other fixed-income instruments are the banks' borrowers. They can obtain cheaper financing for their projects than would have been available by borrowing from a bank.

Unlike bonds and other fixed-income instruments, equities do not generate a fixed return. Instead, they represent shares in a company and the return is determined by the future profits of the company. Given that these profits may vary considerably over time, equity investors normally accept a higher risk than investors in, for example, government bonds. At the same time, the return can be substantially higher. Thus, unlike the fixed-income market, the equity market is a market for capital.

## MANAGING RISKS

However, not all financial services are equally suited to being converted into standardised contracts that can be traded in a market<sup>2</sup>. This is also why financial markets cannot entirely replace financial intermediaries; instead, they complement each other. In addition, the markets create a need for a large number of other, specialist intermediaries such as securities companies and fund management companies. Fund management companies are an example of an intermediary that helps households to manage their savings efficiently. By capitalising on economies of scale, fund management companies can construct port-

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<sup>2</sup> However, financial techniques are evolving continuously. For example, banks' loan stocks are securitised in several parts of the world.

folios of securities (“mutual funds”) where the risks of each individual security can be spread (diversified). So the financial sector does not simply play a role in the intermediation of capital, but also contributes to more effective risk management. Companies and households need to protect themselves against different kinds of risks. Individuals, for example, may need to insure themselves against fire or theft. They can do this by using the products offered by property and liability insurance companies. They may also need to secure their livelihood after retirement or provide for their survivors in the event of premature death. They can do this by taking out life assurance and pension insurance policies with life assurance companies. Insurance companies are financial intermediaries specialising in the assessment and management of insurance risks.

Companies may also need to protect themselves against different types of financial risk, such as adverse changes in the future prices of raw materials or in exchange rates. The growth of the financial markets has created the conditions for trading in contracts – derivatives – that are specially designed to manage risks of this kind. These derivatives include options, forwards and swaps.

#### EFFECTIVE, SECURE PAYMENTS

In addition to mediating capital flows and managing risks, financial companies create the conditions for more efficient processing of payments in the economy. By using the existing financial infrastructure, the banks can support households and businesses via different types of payment service. Such services include accounts and various routines for transferring payments between financial institutions. Charge cards, credit cards and transfers between accounts are now common, enabling goods and services to be exchanged smoothly and economically. The stable performance of financial transactions is important if the economy as a whole is to function efficiently.

## ■ The financial markets

### The equity market

*Equity* is the term for the owners' shares in a company (limited company). The capital contribution made by the owners in return for these shares comprises the company's *equity capital*. A share is essentially a claim on the company's assets and results after the company's creditors, in the first place the company's lenders, have received their due. As the value of this claim is determined by the profitability of the company, equity capital can be regarded as venture capital. However, the shareholders' liability for the company's operations is limited in the sense that they cannot lose more than the amount they invested in the company. Part of the company's profit is usually distributed directly to shareholders as dividends, which in Sweden are usually paid out once a year, while the rest is added to the company's equity capital. Holdings of shares also confer rights of determination over the affairs of the company; each share gives rise to some form of voting rights at the company's annual general meeting.<sup>3</sup>

Companies that are expanding and need an injection of capital may borrow money from a credit institution, issue bonds on the fixed-income market or issue new shares. Because of the risks associated with lending to expanding businesses, the needs of companies for financing can rarely be met fully in the fixed-income and credit markets, at least not at reasonable cost. Some of the funding requirements of these companies may need to be met by issuing new shares that are sold to investors willing to assume risk. Companies generally endeavour to strike a good balance between equity capital and loans.

To ensure that the intermediation of venture capital between companies and a broad range of investors is as efficient as possible, it is often beneficial to turn to an organised marketplace for equities, a stock exchange, for instance. A detailed description of trading on the OMX Nordic Exchange Stockholm (ONBS) follows, then brief presentations of trading in other marketplaces for equities. The section concludes with a description of the trade in equity-related derivatives.

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<sup>3</sup> The normal principle is one share/one vote, although differentiated voting rights also exist. For example, a company may issue class A shares, with 10 votes per share, and class B shares, with only one vote per share.

## Trends of integration in equity trading

In the Nordic and Baltic regions, equity trading has become increasingly integrated over the past few years. Today, within the framework of what is known as the NOREX collaboration, which was established in 1998, a shared regulatory system is applied to stock market trading in Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway and Sweden. The integration also extends to ownership. OMX owns and manages ONBS, together with the Helsinki, Copenhagen, Reykjavik, Riga, Tallinn and Vilnius stock exchanges. Furthermore, OMX owns the Estonian, Latvian and Lithuanian central securities depositories. Finland's central securities depository, APK, is 100 per cent owned by VPC AB. This implies that clearing and settlement are also integrated.

Since October 2006, OMX has been operating the *Nordic Exchange*. The Nordic Exchange is a shared gateway to the Nordic and Baltic financial markets, offer-

ing access to around 80 per cent of stock market trading in these markets.<sup>4</sup> The exchange consists of a Nordic list and a Baltic list. The Nordic list comprises the companies quoted on the ONBS, ONBC and ONBH stock exchanges. Banks and securities companies that are members of these exchanges can offer their customers trading in all companies on the Nordic list. OMX has the intention of adding Icelandic companies to the list in 2007. The Baltic list consists of the companies that are quoted on the Tallinn, Riga and Vilnius stock exchanges.

At year-end 2006, 712 companies were quoted on the Nordic Exchange. At that point, the total market capitalisation of these companies was around EUR 930 billion. The turnover of trading on the Nordic Exchange was around EUR 1,054 billion in 2006. The Exchange had 159 members, of which 137 were members of more than one exchange.

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<sup>4</sup> Note that the Nordic Exchange is not a legal entity.

## TRADING IN EQUITIES ON ONBS

Trading in Swedish shares is overwhelmingly conducted on ONBS. The following section describes the members of the exchange, its trading structure, turnover, issuers and investors on ONBS.

### *Members of ONBS*

All trading on ONBS is conducted via its members. To buy or sell shares, both large and small investors must act via one of these members. The exchange's members consist of companies that fulfil the exchange's membership requirements. These members consist of Swedish securities institutions, i.e. securities companies and credit institutions licensed by the Swedish Financial Supervisory Authority (*Finansinspektionen*) to engage in securities trading. Other members include "remote members", i.e. foreign enterprises that engage in stock market trading in Sweden from abroad. ONBS has around 70 equity trading members, including some 50 remote members. In principle, non-financial companies and branches of foreign companies can be members of the stock exchange. At present, there are no members in this category in ONBS.

The members of the exchange have links to around 600 authorized brokers with access to the market place.

### *Trading structure*

Since 1990, trading on ONBS has been fully automated, in the sense that orders are matched in its electronic trading system SAXESS. Trading no longer takes place on the floor of the exchange. SAXESS is also used for trading in all stock exchanges that are members of the NOREX system, an alliance between the Nordic and Baltic exchanges. NOREX is a collaboration between the stock exchanges in Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway and Sweden.

Once buyers or sellers have placed buy or sell orders with their securities institution, the orders are forwarded to brokers for entry into an order book in the trading system. Today, many members of stock exchanges offer Internet-based services for placing orders. In many cases, this means that transaction costs (for example brokers' fees) will be lower than in trading via securities companies and banks. Orders may be entered in the system as a *limit order*. This means that the customer will state a maximum acceptable bid price or a minimum ask price. Alternatively, it may be placed as a *market order*, where the broker is instructed to trade at the best available price. The system sorts the limit orders according to price and time, the highest bid prices and lowest ask prices being placed first. If the prices are the same for more

than one order, they are sorted according to the time at which they are entered in the system. How long an order remains in the system depends on whether there is a corresponding order in the order book with which to close the deal. When a market order reaches the automatic trading system, it is in principle matched chronologically with the limit orders that have been placed. Before this, however, it will have been dealt with by a broker who assesses when its various elements are to be registered. To put it simply, a limit order may be said to inject liquidity into the market whereas a market order consumes it.

One deviation from the chronological principle applies when the same member has placed both a buy and a sell order for the same security in the system. In this case, these orders are matched first, irrespective of where they have been placed in the system. This applies to both limit orders and market orders. There are also a number of trading rules, for instance concerning the treatment of orders that could have a disruptive impact on trading, which means that orders are not necessarily executed. In addition, there are routines that mean that finalised orders that do not comply with the rules of the stock exchange are cancelled.

When a deal is closed, information is sent to VPC, the Swedish central securities depository and clearing house, where the transaction is settled. During settlement, the shares are deregistered from the seller's VPC account and registered on the purchaser's account (if the customer has a custody account with a broker, the transaction is instead registered in the custodian's management account at VPC). At the same time, payment is made via the buyer's and seller's banks. Only when this is done is the transaction completed (usually three days after the deal is closed). You will find more information about securities settlements in the chapter *The financial infrastructure*.

Even though limit orders and market orders are the only types of orders that exist in the stock exchange trading system, there are differences in how they are executed. For example, it is not unusual for a customer to want a major order to be broken down in the system into smaller lots. The point of this is above all to avoid excessive fluctuations in prices. This makes it possible for the customer's broker to enter what is known as an iceberg order in the system, where only part of the total volume of the order (the "tip of the iceberg") is visible to other participants. When one unit has been executed, the next is automatically entered into the system, and so on until the entire order has been completed.

In the stage between the customer and the broker, pure limit orders and market orders are not the only forms of order to be placed.

One not particularly unusual type of order is the VWAP (volume weighted average price) order. Here the customer's price is set as a weighted average of the prices of all the transactions during the day in the security concerned.

#### *Issues on ONBS*

At the end of 2006, 274 companies were quoted on ONBS.<sup>5</sup> Companies seeking a stock exchange listing must undertake to provide the market with information on decisions and events that may affect the price of the company's shares. The reason for this is that all investors should have access to the same information.

Public companies quoted on ONBS are presented on a single Nordic list, which replaced the A list and the O list in October 2006 (see the fact box above). The Nordic list also presents the public companies that are quoted on the ONBH Exchange and the ONBC Exchange.<sup>6</sup> The ambition is to integrate equity trading in the Nordic region. The Nordic list also offers information on which exchange the equities can be traded on and where they are quoted.

The Nordic list represents a harmonisation of the listing requirements. To be listed on the Nordic Exchange, the anticipated market value of the shares must be no less than EUR 1 million. Further requirements are that ownership must be sufficiently spread and that the business must have existed for a sufficiently long (three years) period and must show stable profitability or have financial resources to cover operations over at least 12 months.

The list is divided into three segments – Large Cap, Mid Cap and Small Cap – based on a market capitalisation of the companies. The Nordic Large Cap segment comprises companies with a market capitalisation of more than EUR 1 billion. Companies with a market capitalisation of between EUR 150 million and EUR 1 billion are placed in the Mid Cap segment and companies with a market capitalisation of less than EUR 150 million are listed in the Small Cap segment.

In each segment, companies are classified into ten sections according to the Global Industry Classification System (GICS). GICS is used as a means of classification on the stock exchanges throughout the world and to enable comparisons between sectors from one country to another.

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<sup>5</sup> Two companies are also listed on the Xterna List, which has now been established by ONBS for trading in equities in foreign companies not listed on ONBS.

<sup>6</sup> As of 2 April 2007, the Reykjavik Exchange has been included on the Nordic list.

The ten sectors are:

- Energy
- Materials
- Industrials
- Consumer Discretionary
- Consumer Staples
- Health Care
- Financials
- Information Technology
- Telecommunication Services
- Utilities

New capital can be brought into the market via new share issues, where existing listed companies increase their share capital by issuing new shares. Otherwise, new capital is introduced via initial public offerings (IPOs) when new companies are listed on the exchange. In 2006, new shares in existing companies were issued to a total value of around SEK 7 billion, and SEK 14 billion was introduced via IPOs. During the same period, however, the redemption and repurchase of shares accounted for a total of around SEK 7 billion.

#### *Investors in the equity market*

Shareholding in Sweden is widespread and extensive. At year-end 2006, the total value of market capitalisation was around SEK 4,200

**Table 1. Shareholdings per Swedish sector and non-residents**  
Per cent

SECTOR	1998	1999	2000	2001	2002	2003	2004	2005	2006
Non-financial companies	6.9	6.8	6.8	8.2	8.5	9.2	8.7	8.4	9.0
Financial companies									
Banks, finance institutions, etc.	1.3	1.9	2.4	2.0	2.5	2.3	3.4	2.8	2.5
Investment companies	6.3	5.9	6.4	6.1	5.6	5.6	5.3	5.3	5.2
Mutual funds	9.1	8.3	8.5	9.8	10.5	11.6	11.1	11.8	11.2
Insurance companies, pension institutions	12.2	12.0	9.8	11.6	10.4	9.2	8.7	8.7	8.1
Financial companies, total	28.9	28.1	27.2	29.5	29.0	28.7	28.5	28.6	27.0
Public sector									
Central government	2.6	1.8	4.9	5.4	5.7	5.5	5.2	4.4	4.5
Local government	0.6	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1
Social insurance funds	4.5	4.3	4.1	3.7	4.1	4.1	3.8	3.5	3.2
Public sector, total	7.7	6.4	9.3	9.3	10.0	9.8	9.2	8.0	7.8
Households	15.0	15.0	13.1	13.7	14.3	14.4	15.0	14.8	14.3
Non-profit making organisations									
Companies	1.8	2.0	2.1	1.9	1.8	1.8	1.8	2.1	2.1
Households	5.1	2.8	2.6	2.9	2.9	2.9	2.8	2.7	2.7
Non-profit making organisations, total	6.9	4.7	4.7	4.7	4.7	4.7	4.6	4.8	4.8
Outside Sweden	34.6	39.0	39.0	34.6	33.5	33.1	33.9	35.3	37.2
ALL SECTORS, TOTAL	100	100	100	100	100	100	100	100	100

Source: Statistics Sweden



billion. Just over 37 per cent of this amount at that time was owned by non-residential investors. The proportion of holdings controlled by financial companies at year-end 2006 was around 27 per cent, of which investment funds represented just over 11 percentage points. Just over 14 per cent comprised direct holdings by Swedish households, while non-financial companies accounted for 9 per cent of total equity assets. Public-sector holdings represented almost 8 per cent, of which the AP funds accounted for just over 3 percentage points. Holdings by non-profit-making organisations totalled not quite 5 per cent of the total market capitalisation.

#### *Turnover and market capitalisation on ONBS*

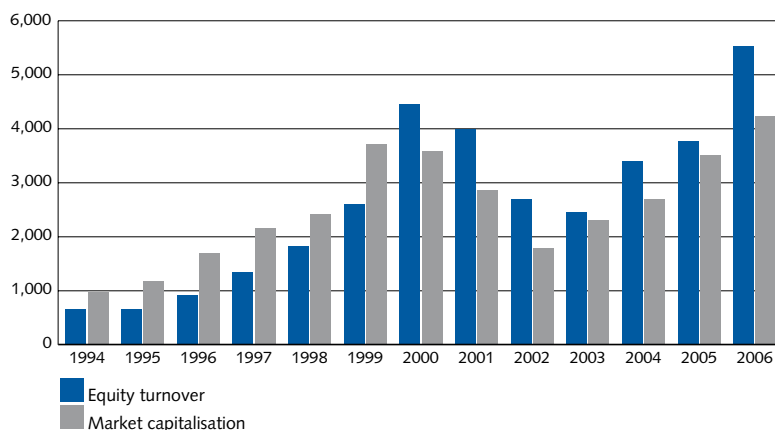
Equity turnover on ONBS was approximately SEK 5,519 billion in 2006, an increase of just over 40 per cent on the preceding year. The average turnover per trading day thus totalled around SEK 22 billion. Compared to the fixed-income market, for example, the turnover in SEK is roughly half in the equity market. On the other hand, the

**Table 2. Some key ratios for share trading on ONBS in 2006**

Market capitalisation, 31 Dec. 2006, SEK billion	4,227
Turnover 2006, SEK billion	5,519
Average daily turnover, SEK billion	22.0
Annual turnover, billion shares	82
Total number of deals closed during year, million	17.5
Average amount per deal	315,760
Average number of deals per day	69,856
Rate of stock turnover, per cent	147

Source: ONBS

**Chart 1. Equity turnover and market capitalisation on ONBS  
SEK billion**



Source: ONBS

number of transactions is considerably higher than in the fixed-income market (see the section on the fixed-income market).

## OTHER MARKETPLACES FOR SHARE TRADING

### *Stock exchanges*

Alongside ONBS AB, *Nordic Growth Market* (NGM) is also licensed by the Swedish Financial Supervisory Agency to operate a stock exchange in Sweden. NGM specialises in small growth companies and offers listing and share trading in the NGM Official and NGM Equity lists, as well as derivatives trading in the Nordic Derivatives Exchange list (NDX). Some 50 shares are listed on NGM Equity. In 2006, turnover from trading on NGM amounted to SEK 13.3 billion, an increase of approximately 45 per cent on the preceding year.

### *Authorised marketplaces*

Swedish legislation also contains the concept of *authorised market place*. An authorised marketplace operates essentially as a stock exchange, although it does not impose the same requirements on the composition of the board and the establishment of disciplinary committee as a stock exchange. In addition, its requirements as to price listing, information and reporting are somewhat less far-reaching. At year-end 2006, only *AktieTorget AB* was operating an authorised marketplace in Sweden.<sup>7</sup> Trading takes place using SAXESS, the trading system used on ONBS. Trading via *AktieTorget* consist mainly of "growth shares" in small companies. At year-end 2006, 58 companies were listed on *AktieTorget*. In 2006, the turnover and trading on *AktieTorget* totalled approximately SEK 3,600 million.

### *Organised trading outside the marketplaces*

Unofficial trading also takes place in shares of small companies that are not listed on a stock exchange or authorised marketplace. This trading is sometimes called list trading and is organised by companies that are licensed to engage in securities trading.

The trading that is conducted on *First North* is one example of such trading.<sup>8</sup> The companies that are traded on *First North* are not registered on ONBS, although trading is conducted, as on *AktieTorget*, via SAXESS. Information about prices, volumes and order depth is published in real time through the same channels as for listed shares. On the other hand, ONBS does not take responsibility for monitor-

<sup>7</sup> However, *AktieTorget* has been licensed by the Swedish Financial Supervisory Authority since 29 March 2007 to conduct business as a securities company.

<sup>8</sup> *First North* replaced *Nya Marknaden* in June 2006, developed on the basis of the new legislation arising from MiFID. OMX's intention is that *First North* will be operated as MTF when this becomes possible.

ing the companies listed on First North. Instead, every company has a "sponsor", which under an agreement with ONBS assumes responsibility for ensuring that the company meets the requirements for having its shares traded on First North and complies with the appropriate information requirements on a continuous basis. The sponsors are in turn required to enter into agreements with the companies for which they are responsible. These agreements specify the requirements for being traded on First North, including with regard to free float, market value and information. First North, intended for small companies and growth enterprises, operates as an alternative marketplace on the OMX Nordic Exchange. In 2006, First North was extended to include companies in Denmark and Iceland.

Another platform for trade in small and medium-sized growth companies that are not yet ready for a stock market listing is *Nordic MTF*.<sup>9</sup> Trading in Nordic MTF is maintained by sponsors and conducted using the NGM trading system TELLUS.

Two further examples of list trading in unlisted shares is the trading conducted on *Göteborgs OTC-lista* (the Gothenburg OTC List), which is operated by the Thenberg & Kinde Fondkommission (stockbrokers), and the *BeQuoteds inofficiella aktielista* (the BeQuoted unofficial share list).

ONBS also has a list to enable trading in shares in foreign companies that are not formally listed on ONBS; this is known as the *Xterna* list. Trading on the *Xterna* list takes place via the stock exchange's trading system and the regulatory framework for ONBS's members applies. But companies on the *Xterna* list do not sign a listing agreement with ONBS in the same way as companies on the Nordic Exchange. One requirement for a company to be included on the *Xterna* list is that one or more market makers must have undertaken to be responsible for a market in the company's shares. The market makers must enter into an agreement with ONBS on the content of the undertaking. Deals in the company's shares must be settled and registered with VPC in accordance with VPC's regulations and the majority of corporate events that can take place are dealt with by VPC. At year-end 2006, the *Xterna* list comprised two companies, Pfizer Inc. and LogicaCMG Plc.

Both established companies and those that are not yet ready for a stock exchange listing or other form of public trading in their shares can sometimes acquire funding in the form of private equity. Financing of this kind is sometimes channelled through a particular type of

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<sup>9</sup> Nordic MTF will replace Nordic OTC as a result of adaptation to the new legislation arising from MiFID.

intermediary known as private equity and venture capital companies. Private equity investment companies are described in more detail in the chapter *Financial intermediaries*.

#### TRADING IN EQUITY-RELATED DERIVATIVES

An *equity option*, or stock option, is a contract whereby the holder has the right, but not the obligation, to buy or sell the share at a specified price on a specified date in the future. In turn, the writer of the option has the obligation, but not the right, to exercise the option. An *equity forward* is a contract whereby the buyer and seller have undertaken to buy or sell a certain share on a specified future date at a predetermined price.

The vast majority of the derivative contracts based on Swedish equities as the underlying asset that are traded via ONBS involve *options* and *forwards*. In addition to derivative contracts for individual equities, trading on ONBS also includes options and forwards that are linked to the exchange's equity indexes, OMXS30 options and OMXS30 forwards. ONBS also offers trading in *options* and *forwards* in Danish, Finnish and Norwegian equity-based derivatives. This trading is conducted via a common order system which is also available to members of the Oslo Stock Exchange and EDX London.<sup>10</sup> The exchange also offers an OTC clearing service for derivative contracts not listed for trading.

The number of standardised derivative contracts linked to Swedish equities and the OMX index traded on ONBS in 2006 totalled around SEK 111 million. The bulk of these (almost two thirds) were equity options, 22 per cent were OMXS30 forwards, 12 per cent OMXS30 options and 8 per cent equity forwards. Trade is carried out in contracts for lots of 100 shares.

In addition to this trading in standardised equity and equity index derivatives, trading also takes place on ONBS in *warrants*. The word warrant is now used in the Swedish financial market for a rather profuse flora of securities. In most respects, warrants resemble call options, i.e. they give the holder the right, but not the obligation, to purchase the underlying asset at a set price before or at a set time. Warrants can be issued on a broad spectrum of underlying assets, such as domestic equities, foreign equities, domestic equity indices, foreign equity indices, equity baskets, currency, raw materials etc. Characteristic of warrants is that they usually have a considerably longer time horizon than ordinary options – sometimes several years. In addi-

<sup>10</sup> A joint system is operated with derivative exchanges and clearing houses in Oslo and London. The system was established via an exchange and clearing link known as LEC (Linked Exchange and Clearing).

tion, they are issued by a party – in most cases a bank or a securities company – other than the one issuing the underlying asset, which distinguishes a warrant from, for example, a subscription option. Furthermore, warrants are transferable. In this way, it differs from the non-transferable contracts created for standardised options on ONBS, which acts as the central counterparty in these transactions (see the section on transactions with derivative instruments in the chapter *The financial infrastructure*).

During 2006, the turnover in trading in warrants on ONBS totalled just over SEK 11 billion, representing around 333,000 transactions.

Warrants are also traded in Sweden on the Nordic Derivatives Exchange (NDX), which is operated by NGM.

Off the exchanges, trading is conducted in “Contracts for Differences”, which may be described as forward contracts without a set date of maturity. These contracts may be both bought and sold. The investor provides collateral, which is continuously updated, and also pays a daily interest charge as long as the position remains open. Any profit or loss is determined by the performance of the underlying instrument from the time of purchase or sale until the time the CFD is closed.

## The fixed-income market

Unlike the equity market, the fixed-income market is a market for trading instruments that yield a specific predetermined return, an *interest rate*. Compared to the volume of trading in shares, considerably fewer settlements take place in the fixed-income market, but these usually involve substantially larger amounts. The fixed-income market is often divided into a *bond market* and a *money market*.

The bond market comprises trade in securities – bonds – generally with maturities of one year and longer. Trading in the money market comprises Treasury bills and certificates, usually with maturities of less than one year.

The participants are largely the same in these markets (primarily central government, mortgage institutions and banks). In addition, the issuance procedure and the structure of trading are similar, with the exception of the segment with the shortest maturities. On the other hand, the purposes underlying the trading in the various sub-markets differ somewhat. In simple terms, the main purpose of the bond markets is to channel long-term savings from some participants to others in need of capital. The most important function of the money market is to facilitate liquidity management, while another is provide short-

term finance. In the part of the money market where instruments with the shortest maturities are traded (from one day to one week), daily adjustments of deficits and surpluses in the transaction accounts of the participants in the market are carried out. Since a large part of the turnover takes place in this very short-term segment, often with specific contract arrangements, special attention will be devoted to it in this section.

Complementing the basic instruments in the fixed-income market, *derivative instruments*<sup>11</sup> are also traded with interest-bearing securities as the underlying asset. These derivatives help participants in the fixed-income markets, for example, to diversify and manage risk. They also enable the participants to change their net positions and create more or less whatever maturities they want in their fixed-income portfolios. As a result, investors are in practice unconstrained by whether the security originally was issued with a short or long maturity. This publication, however, makes a simplification for illustrative purposes. Here, the bond and money markets are categorized on the basis of investors' requirements for maturities and liquidity. In practice, the aims of the operators in the different market segments may differ from this description.

#### THE BOND MARKET

Interest-bearing securities are issued in the bond market where trading usually takes place in maturities of a year or longer. A bond is a debt instrument that usually comprises a series of coupon payments<sup>12</sup> and a final repayment of principal. They may be simply transferred between holders. The bond market brings together managers of long-term sav- ings with participants that need to borrow capital.

The bond market can be divided into a primary market for new bond issues, and a secondary market where investors can buy and sell bonds that have already been issued. A sale in the primary market provides direct revenue for the issuer of the bond. Thus, the issuer is the borrower in the market.

The dominant borrowers in the bond market are central government and the mortgage institutions, but certain municipalities and companies can issue bonds too. Bonds tend to be issued by entities

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<sup>11</sup> "Derivative instrument contracts that are linked to securities (instruments) in the capital, credit and money markets, and that entered into (and traded) by the operators in the secondary (second-hand) market. The object of derivative instruments is to manage portfolio risks (exchange rate and interest-rate risks). Derivative instruments include interest forwards, interest options and interest swaps." Terms defined in *Nationalekonomi* (Glossary of Macroeconomic Terms), Dickson, Luukkainen and Sandelin, 1992.

<sup>12</sup> Interest payments and any amortisations. Bonds that do not have interest payments during the time to maturity are called discount bonds or zero coupon bonds. Central government also issues *inflation-linked bonds*, where interest payments and final repayment of principal are linked to the trend of inflation.

with long-term capital requirements. Often, the investors in the bond market are also interested in longer-term holdings (savings). Investors who have bought bonds at issue can choose to sell them on in the secondary market. If the secondary market is efficient, liquidity in the securities will be good. This will make the bonds easier to sell and buy and thus more attractive to investors. A high demand for bonds in turn reduces the borrowing costs of the issuers.

#### *Issuers in the bond market*

The largest issuers in the bond market are central government and the mortgage institutions, each representing close to 40 per cent of the total volume issued. At year-end 2006, this amounted to nearly SEK 1,900 billion, a rise of around SEK 120 billion from the preceding year.

The Swedish National Debt Office manages central government borrowing in the bond market. Central government borrowing finances the national debt. At the end of 2006, government bonds amounted to nearly SEK 770 billion, as it did at year-end 2005 (see Chart 2).

The mortgage institutions issue bonds mainly to finance lending to the public for purchases of property. Total borrowing by the mortgage institutions in 2006 rose by around SEK 60 billion, to nearly SEK 750 billion by year end. It should be mentioned here that part of the outstanding stock of mortgage bonds were converted into secured bonds during 2006. Secured bonds give the holder priority right to compensation in the event the issuer is declared bankrupt.<sup>13</sup>

Non-financial companies, for example industrial enterprises, may raise capital by issuing bonds. At year-end 2006, borrowing by non-financial companies in the Swedish bond market totalled just under SEK 160 billion, an increase of around SEK 20 billion on the figure for the preceding year. Many companies, above all major listed corporations, go to international corporate bond markets to obtain access to capital, where trading is conducted in EUR or USD. Loans in foreign currency are generally converted to SEK using derivatives, mainly foreign exchange swaps (see also the section on the foreign exchange market).

In addition to their tax revenues, municipalities and county councils may need to avail themselves on bonds to finance their undertakings and investments. Only a small number (ten municipalities and two county councils) had outstanding listed bonds at year-end 2006 in their own name. Of these, the City of Stockholm had the largest

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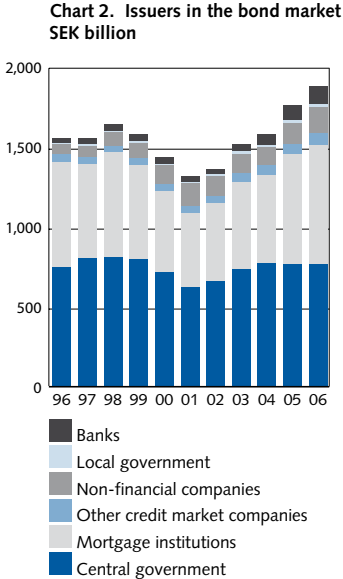
<sup>13</sup> In addition, secured bonds must be issued by a bank or credit market company subject to particular public supervision. Furthermore, a specified volume of collateral must be attached to the bonds. The value of the collateral must exceed the value of the bonds issued.

outstanding stock, followed by Stockholm County Council, the Municipality of Sundsvall and the Municipality of Södertälje. A further 182 municipalities and seven county councils had outstanding bond loans in association with Kommuninvest, a credit market company.<sup>14</sup> Borrowing by the municipalities amounted to approximately SEK 20 billion at year-end 2006, a slight increase compared to the figure for 2005.

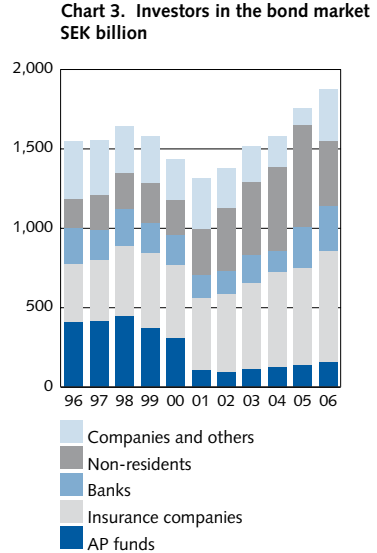
Banks, and also to some extent other credit market companies (such as pension funds and finance companies), increased their borrowing via the bond market in 2006. In the case of the banks, this represented an increase of 26 per cent, to SEK 115 billion at year-end. Borrowing by other credit market companies totalled SEK 74 billion at year-end 2006.

### *Issuance procedures*

Government bonds are issued and sold via auctions in which authorised dealers for the Swedish National Debt Office's participate. These dealers comprise a number of banks and securities companies with which the National Debt Office has signed contracts. At present, six or seven dealers are used, depending on the form of security to be



Source: The Riksbank  
Note: Outstanding nominal amounts.



Source: The Riksbank

<sup>14</sup> Credit market companies are finance companies that finance their activities with money from the public. These companies are under the supervision of the Swedish Financial Supervisory Authority and are covered by deposit guarantees. For more information, go to see [www.fi.se](http://www.fi.se).



auctioned. In their contracts, the dealers undertake to act as *market makers*. Acting as a market maker in this market involves a commitment to submit bids for every issue and set prices for customers for the securities issued by the State.

The mortgage institutions also issue their bonds through authorised dealers, which consist of banks and securities companies. In this case, however, there is no auction procedure. The bonds are instead sold to the dealers continually according to the borrowing needs of the mortgage institutions. The process is known as *on tap* sales.

Companies often have agreements with one or more banks on borrowing programmes in which they issue bonds on specific predetermined terms. As has already been pointed out, companies also issue securities abroad and then convert these loans to SEK using derivatives (see the fact box on covered interest rate parity).

Alongside the company issues that are aimed at large groups of investors, there is also a market for "*private placements*". These often involve bond loans that are issued in their entirety to one or a small number of investors. The conditions are subject to negotiation and the issues are largely designed to meet the wishes of the investors. It has become increasingly common for companies to opt for this form of borrowing.

#### *Investors in the Swedish bond market*

At year-end 2006, insurance companies represented the category of investors with the largest holding in the bond market (see Chart 3). At that point, holdings of bonds by insurance companies had risen by just under SEK 90 billion, to just over SEK 700 billion. As a result, the insurance companies accounted for a shade less than 40 per cent of the total amount outstanding in the bond market, measured in SEK at year-end 2006.

At the same time, non-residential investors<sup>15</sup> had an aggregate holding in the bond market totalling nearly SEK 440 billion.

Bond holdings by the banks increased slightly during 2006 from approximately SEK 260 billion at year-end 2005 to approximately SEK 280 billion.

Bond holdings in the category "Companies and others"<sup>16</sup> totalled SEK 330 billion at year-end 2006.

<sup>15</sup> No detailed information exists as to which types of non-residential investor make up the category "non-residential" in statistics for the financial market that are issued by Statistics Sweden (SCB). It is likely that major foreign pension funds represent a major share of this category, together with holdings by Swedish investors via foreign companies.

<sup>16</sup> The "Companies and others" category is a heading for residual items in the figures provided by Statistics Sweden on investors in the bond market and is derived from the difference between the outstanding stock of securities in the bond market and the holdings by major investors.

The Swedish bond holdings of the AP funds, the Swedish national pension funds, have declined considerably over the years, but had risen slightly at year-end 2006 compared to the preceding year-end. The AP funds holdings in the bond market then totalled just under SEK 160 billion, a decline of roughly half the total since year-end 2000.

### *Trading structure*

There is an active second-hand market, a *secondary market*, for government and mortgage institution bonds. Company bonds, on the other hand, are normally retained by investors until maturity, resulting in less trade on the secondary market. Government bonds are the security that is most traded in the bond market. This is because these are issued in large volumes and are exposed to low credit risk (see also the section on trading below).<sup>17</sup>

The market for government bonds is still conducted largely by telephone, although electronic trading does take place on a limited scale.<sup>18</sup> At present, electronic trading comprises three *benchmark bonds* and is conducted via the electronic system known as SAXESS.<sup>19</sup>

The market makers (the dealers) referred to above function as intermediaries in bond trading. The trading that takes place between these dealers is normally referred to as *interbank trade*. Trade by the dealers with other counterparties, for example industrial enterprises or insurance companies, is referred to as *customer trade*.

In addition, there are special intermediaries known as *brokers*. They are normally well-established international brokerage companies whose only clients are institutional participants (banks). Brokers do not take their own positions. In certain circumstances, interbank operators can advise their interests via a broker to avoid revealing them to their competitors.

A majority of the market makers in government bonds also act as market makers in mortgage bonds. Because the trade in corporate bonds is relatively limited in Sweden, it is uncommon for both bid and ask prices to be quoted in the trading systems on a regular basis. It is more likely that prices for corporate bonds will be quoted in response to a client's request.

<sup>17</sup> In this context, credit risk refers to the risk of failure by the issuer of the bond to fulfil their contractual obligations. When the Swedish State is the issuer of the bond, this risk may be considered minimal.

<sup>18</sup> The electronic platform for fixed-income trading was introduced in May 2001, as a result of collaboration between the interbank participants, OM Råntebörsen and the Swedish National Debt Office.

<sup>19</sup> Benchmark bonds consist of the most frequently traded government bonds with maturities of two, five and ten years.

The particular market conventions applying to bonds in SEK are provided in Annex 2.

#### *Turnover in the bond market*

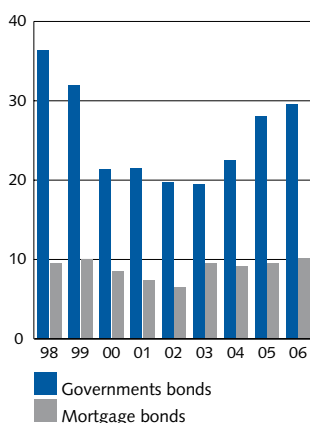
The Riksbank compiles statistics on turnover from its seven primary monetary policy counterparties (see the fact box on Riksbank facilities for short-term borrowing and investment requirements).

At present these are the same as the Swedish National Debt Office's dealers in the government bonds.<sup>20</sup> The statistics show that turnover in the bond market rose slightly during 2006, compared with the preceding year, to an average of just over SEK 40 billion per day (see Chart 4). Government bonds accounted for the increase. Turnover increased from on average just over SEK 28 billion per day in 2005 to nearly SEK 30 billion a day in 2006. Turnover in mortgage bonds totalled on average SEK 10 billion per day in 2006, more or less unchanged from the preceding year.

Of the total turnover in government bonds in 2006, more than 98 per cent took place in the secondary market. The primary market – i.e. new issues – accounted for as little as just below 2 per cent.

Alongside the institutional trading in bonds, trading also takes place in private bonds on ONBS. This is conducted electronically, unlike institutional trading. Here, trading takes place in, for example, private bonds, structured products and debenture loans, which are

**Chart 4. Average daily turnover in the bond market**  
SEK billion



Source: The Riksbank

Note: Spot turnover on the bond market (including new issues). Spot means that purchase and sales decisions are closely linked to delivery – unlike derivatives. Payment and delivery of bonds takes place three days after trade date.

<sup>20</sup> The Riksbank's primary monetary policy counterparties are ABN AMRO Bank NV, Danske Consensus, E Öhman J:or Fondkommission, Nordea, SEB, Svenska Handelsbanken and Swedbank.

aimed primarily at private individuals and other small investors. Turnover in private bonds (formerly via the SOX list) totalled SEK 7.8 billion in 2006, up SEK 3.1 billion on the preceding year. The number of new loans listed also rose by 300 between year-end 2005 and year-end 2006, to 1,046 in December 2006.

### THE MONEY MARKET

The money market is the collective term used to refer to markets for interest-bearing assets that are issued with maturities generally of up to one year. One important task for the money market is to facilitate liquidity management in the economy. Banks, for example, need to maintain a state of preparedness for future deposits and payments. The banks invest in assets according to their anticipation of future payments. As a result, it must be possible for their investments to be readily converted into liquid funds when their payments fall due.

The procedure for issuing and trading securities in the money market is largely the same as in the bond market. However, the money market is smaller than the bond market. The outstanding value of short-term paper is less than a third of the volume of outstanding securities in the bond market. As in the bond market, there are a number of conventions in the money market to facilitate trade, see Annex 2.

#### *Issuers in the money market*

Central government borrowing in the money market takes place through Treasury bills. Other institutions lend by issuing certificates, such as bank certificates and mortgage certificates. A Treasury bill<sup>21</sup> is a debt instrument that represents a short-term claim on the State and that can be bought and sold in the money market. Treasury bills are issued by the National Debt Office. A certificate is the same kind of debt instrument as a Treasury bill but is issued by, for example, banks and companies.

Treasury bills play a dominant role in the money market, accounting for 50 per cent of the outstanding stock of short-term securities in 2006 (see Chart 5). However, the volume of outstanding Treasury bills declined by SEK 35 billion to just under SEK 260 billion at year-end. Treasury bills are used, for example, to facilitate management of fluctuations in central government's short-term loan requirements. The National Debt Office also arranges short-term – or "on-tap" – sales

<sup>21</sup> Treasury bills are structured like a zero coupon bond, i.e. a security without interest payments during the term of the bill.

of Treasury bill. On-tap bills are used for short-term liquidity management (for periods of up to six weeks). The maturities of the bills may be tailored to the National Debt Office's borrowing requirements by adjustment of dates of issue and maturity dates.

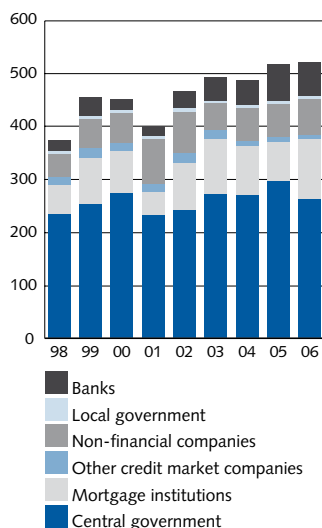
Borrowing by the banks also fell during 2006. Compared to the 2005 figure, borrowing by the banks was down by SEK 8 billion, to just over SEK 60 billion at year-end 2006.

On the other hand, borrowing by the mortgage institutions increased, by just over SEK 40 billion in 2006. At year-end, the outstanding loan stock of these institutions totalled SEK 113 billion. The main aim of short-term borrowing by the institutions is to match lending to customers in order to manage the institutions' interest rate risks.<sup>22</sup>

#### *Investors in the Swedish money market*

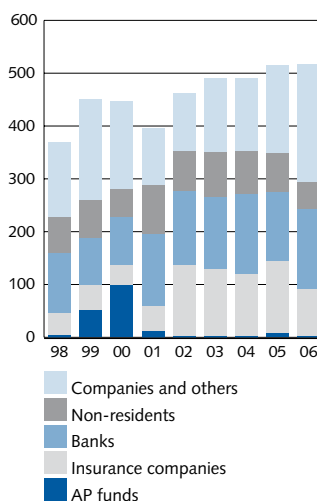
"Companies and others"<sup>23</sup> have the largest holdings in the money market. At year-end 2006, companies and others represented more

**Chart 5. Issuers in the money market  
SEK billion**



Source: The Riksbank

**Chart 6. Investors in the money market  
SEK billion**



Source: The Riksbank

<sup>22</sup> However, the level of borrowing by the mortgage institutions via certificates is relatively low, compared to their short fixed-rate lending. In order to match the fixed-interest periods of financing by the institutions and their lending to households, the institutions issue bonds that are subsequently converted into short interest via swap contracts. In addition, mortgage institutions borrow from their parent banks. For more information, see the description of swap contracts in the sections "Derivative instruments in the fixed income market" and "Standard instruments in the Swedish currency market".

<sup>23</sup> The "Companies and others" category is a heading for residual items in the figures provided by Statistics Sweden, calculated from the discrepancy between the outstanding stock of securities in the money market and the holdings of these securities by the major investors.

than 40 per cent of short-term debt securities. The banks' holdings represented around 30 per cent, while those of the insurance companies made up just under 20 per cent (see Chart 6). Companies and others increased their holdings by around SEK 55 billion to a total of just over SEK 220 billion, while the insurance companies reduced their money market holdings by almost as much during 2006. This means that the outstanding nominal amounts for the insurance companies totalled nearly SEK 90 billion at year-end.

The banks' investments rose by around SEK 20 billion in 2006 to approximately SEK 150 billion, compared to the figure at the end of the preceding year. "Non-resident investors"<sup>24</sup> reduced their holdings by nearly as much as investments by the banks increased. At year-end 2006, holdings of money market securities by non-resident investors totalled nearly SEK 55 billion compared to around SEK 75 billion at year-end 2005. Thus, holdings of securities in the Swedish money market by non-resident investors account for just below 10 per cent of the total.

At year-end 2006, money market investments by the AP funds had halved to SEK 3 billion, compared to the figure for the preceding year, SEK 7 billion. However, the share of the total outstanding volume represented by the AP funds was just 1 per cent, as at the preceding year-end.

It is worth noting that from 2000–2005, the insurance companies raised their outstanding volumes in short-term securities by almost SEK 100 billion, while during the same period the AP funds have reduced their holding in corresponding securities by approximately SEK 90 billion.

#### *Turnover in the money market*

In 2006, turnover in Swedish Treasury bills amounted to around SEK 10 billion per day, in line with turnover in the preceding year. Turnover in mortgage certificates rose from around SEK 2 billion in 2006 to just over SEK 3 billion on average per day between year-ends 2005 and 2006 (see Chart 7).

Of the total turnover in Swedish Treasury bills during the whole of 2006, the secondary market accounted for just over SEK 1,900 billion, while the primary market accounted for around SEK 650 billion (roughly one quarter), i.e. via new issues.

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<sup>24</sup> No detailed information exists as to which types of non-residential investor make up the category "non-residential" in statistics for the financial market that are issued by Statistics Sweden (SCB). It is likely that major foreign pension funds represent a major share of this category, together with holdings by Swedish investors via foreign companies.

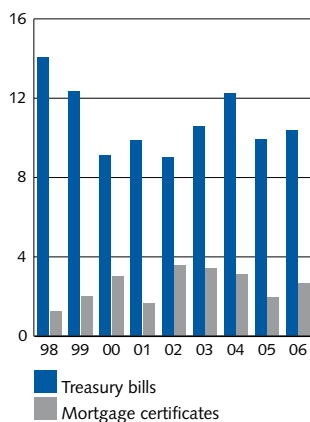
In total, turnover in the money market rose by approximately SEK 1 billion per day in 2006 compared to 2005.

### THE MONEY MARKET'S SHORTEST SEGMENT

Ordinary securities are less practical when maturities in the money market are reduced to a week or less. Other contract solutions are used instead, such as *deposit contracts*, *repos* and *FX swaps*. These standardised contracts offer the participants greater flexibility in borrowing or investing in the shortest periods of maturity. The money market's shortest segment is also referred to as the overnight market.

The Riksbank can also provide deposit and lending facilities for the shortest periods of maturity (even though the conditions offered are always less advantageous as is explained below). Institutions that are participants in the Riksbank's central settlement system, RIX<sup>25</sup>, and are involved in the implementation of monetary policy through an agreement with the Riksbank, may in fact take advantage of a number of separate facilities for depositing or borrowing money with short maturities. Depending on the level of counterparty agreement the participant has signed with the Riksbank, short-term lending or deposit facilities may be provided in the form of intra-day facilities, fine-tuning operations, standing facilities or monetary policy repos (see the fact box on Riksbank facilities for short-term borrowing and investment requirements).

**Chart 7. Average daily turnover in the money market SEK billion**



Source: The Riksbank

Note: Spot turnover on the money market (including new issues). Spot means that purchase and sales decisions are closely linked to delivery – unlike derivatives. For Treasury bills and mortgage certificates payment and delivery takes place two days after trade date.

<sup>25</sup> See the section on RIX in the chapter *The financial infrastructure*.

The shortest part of the money market is especially important in evening out the banks' daily deficits and surpluses in their transaction accounts in the RIX settlement system. These imbalances arise when the banks' inward and outward payments do not match one another in time and when unforeseen payments arise during the day. While the banks make forecasts in order to determine the need for liquidity to carry out their payments, customers' business transactions and transfers by portfolio managers and other financial participants within their foreign exchange and securities portfolios may create further imbalances that may need to be adjusted during the day.

Because the Riksbank, along with the market participants, offers its counterparties facilities for borrowing or depositing funds at predetermined interest rates, a potential alternative always exists to the interest rates offered by the market.<sup>26</sup> The market participants therefore have an incentive for agreeing a rate within those offered by the Riksbank for depositing and borrowing.<sup>27</sup> In this way, the terms for the money market's shortest segment are decided in practice by the Riksbank.<sup>28</sup>

### *Deposit contracts*

Deposit contracts (deposits) are standardised deposit and loan agreements, without requirements for collateral. As with bonds and certificates, for example, the loan ceiling is set for deposits by the banks' counterparty limits. Investments in deposits affect the banks' balance sheets and capital adequacy requirements. Every time lending takes place via deposit contracts, the capital adequacy requirement is affected, depending on the risk associated with the counterparty.<sup>29</sup> Normally, market participants do not use deposit contracts for depositing and lending for longer than a week. This is because the counterparty limits and capital adequacy requirements make this form of contract more expensive than other financial contracts with longer maturities. Deposits are more likely to be used to even out the need for liquidity between the banks overnight. The banks have, quite simply, agreed to trade in liquidity among themselves and in return to pay neither more nor less than the Riksbank's repo interest rate.<sup>30</sup>

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<sup>26</sup> For example, the Riksbank offers an interest rate for borrowing and deposits 75 points above/below the repo rate. The bank's key interest rates may be viewed at [www.riksbank.se](http://www.riksbank.se).

<sup>27</sup> See for example the brochure *The Riksbank's Management of Interest Rates – Monetary Policy in Practice*, Sveriges riksbank 2005.

<sup>28</sup> More information on the shortest segment in the money market may be found in an article entitled *The Swedish Market for Balancing Liquidity* in *Economic Review* 2005:4.

<sup>29</sup> See article *The Swedish Market for Balancing Liquidity* in *Economic Review* 2005:4.

<sup>30</sup> See the book "Penningmarknaden", Nyberg, Viotti and Wissen, 2006.



The major banks estimate that around 90 per cent of the turnover on deposit contracts involves maturities of up to two days. In 2006, the institutions designated by Statistics Sweden as Monetary Financial Institutions<sup>31</sup> had, at the end of each month, average outstanding deposit volumes of SEK 160 billion. The major share of this amount, SEK 140 billion, consisted of deposits in Swedish credit institutions.<sup>32</sup>

#### *Repos ("repurchase agreements")*

A repo is an agreement whereby one party undertakes to sell a security to another party in return for liquid funds. At the same time, it is also agreed that the same security will be repurchased at a fixed price at a given time in the future.

A repo transaction is composed therefore of two parts, a sale (spot) and an agreement to repurchase at a later date (forward). The company that wants to obtain liquidity via repos must have a portfolio of securities on which it can raise loans, which is not the case when deposits are used. It also means that the financial risk to the lender in a repo transaction is considerably lower than in a deposit contract. This risk consists only of the risk of a fall in the market value of the security of the repo. The repo functions essentially as a collateralised loan over the life of the repo. Conversely, repos may be viewed as security loans collateralised with cash. The pledged security cannot be sold during the term of the agreement. If the borrower cannot honour his or her debts at the end of the period, ownership of the security is transferred to the lender; hence repos expose the lender to minimal counterparty risk. In principle, all securities that can be traded on the fixed-income market can be used as securities for repos.

Turnover in repo transactions backed by government and mortgage securities<sup>33</sup> is very high. Among the Riksbank's primary monetary policy counterparties, turnover averaged just over SEK 176 billion per day in 2006. This may be compared with the spot turnover in similar certificates, which totalled around SEK 53 billion per day in 2006. In other words, spot trades represented no more than just over a third of average daily turnover in repos. The turnover in repos increased by nearly SEK 35 billion on average per day during 2006, compared to

<sup>31</sup> Monetary Financial Institutions comprise banks, mortgage institutions and credit market companies.

<sup>32</sup> Swedish credit institutions report their outstanding volumes in deposits in different currencies monthly to Statistics Sweden, which compiles financial market statistics. A credit institution is a bank, mortgage institution or finance company that accepts deposits or close substitutes for deposits from others (not only credit institutions) and that provides credits or invests in securities on its own behalf. The definition of the Swedish banking day is not unambiguous; the definition usually refers to maturity O/N, but T/N may also appear (see the annex on trade conventions).

<sup>33</sup> Includes Treasury bills, nominal government bonds, mortgage certificates and mortgage bonds. Inflation linked government bonds are not included in these figures.

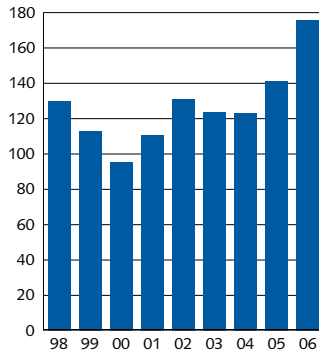
the figure for the preceding year (see Chart 8). An estimated 90 per cent of the turnover in repos involved maturities of up to one week.

According to Statistics Sweden's financial market statistics, the outstanding volume of repo borrowing by the monetary financial institutes at the end of each month averaged just over SEK 150 billion in 2006. Roughly half of this amount, SEK 75 billion, was attributable to the repo borrowings of Swedish credit institutions.

Figure 1 presents the financial contracts available in the shortest segment of the money market for maturities of up to one week, as well as the participants that use them.

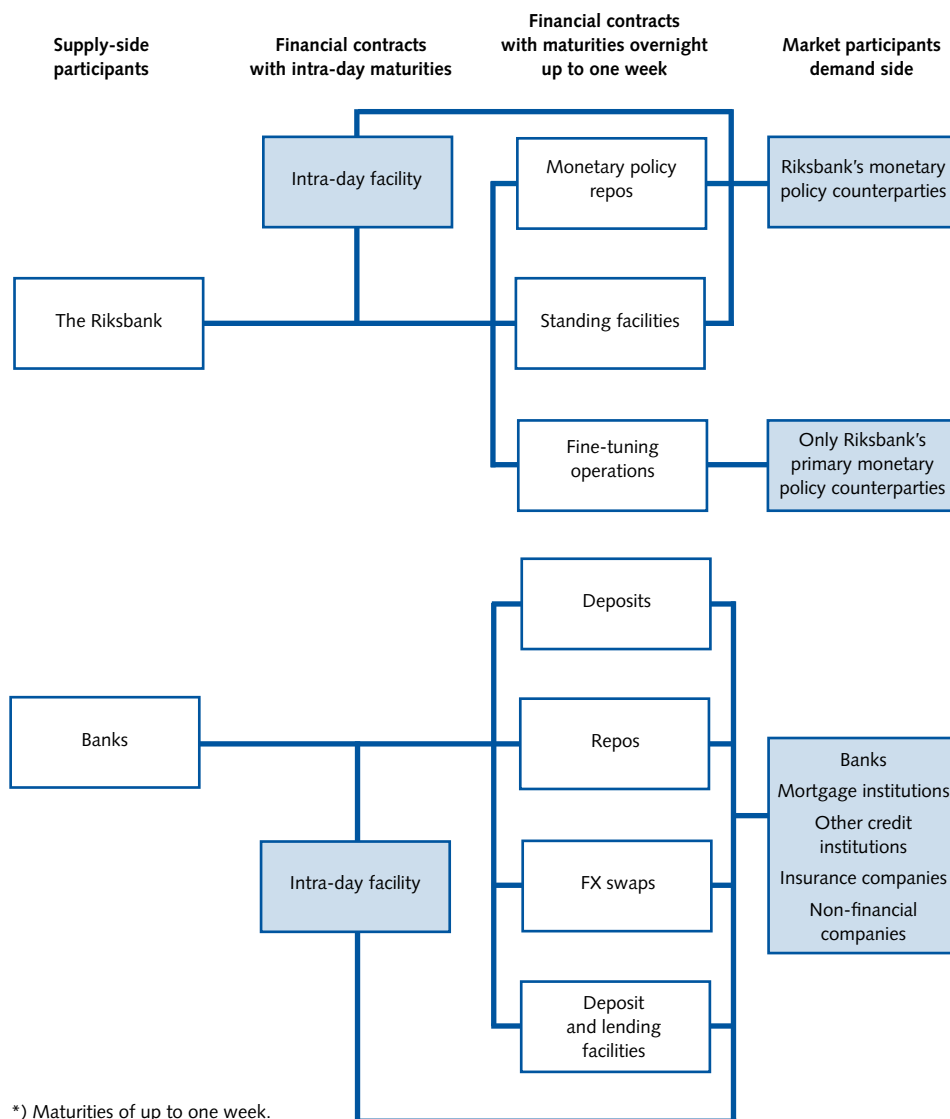
The particular conventions used in trading in short-term contracts in the money market can be found in Annex 2.

**Chart 8. Average daily turnover  
in repos  
SEK billion**



Source: The Riksbank

Figure 1. Participants and types of contract in the shortest segment of the money market\*



## Riksbank facilities for short-term borrowing and deposit requirements

The Riksbank offers facilities for depositing or borrowing money for short periods of maturity. These facilities are available to participants in the Riksbank's central settlement system RIX and institutions involved in the implementation of monetary policy through another agreement with the Riksbank. Depending on the level of the involvement in monetary policy laid down in the agreement with the Riksbank, short-term lending and deposit facilities may take the form of *intra-day facilities*, *fine-tuning operations*, *standing facilities* or *monetary policy repos*.

The Riksbank's counterparties in the fixed-income market comprise RIX participants, monetary policy counterparties and primary monetary policy counterparties. In 2006, the Riksbank had 20 RIX participants, 13 which were also monetary policy counterparties. Seven participants were also primary monetary policy counterparties.<sup>34</sup>

RIX participants have access to the Riksbank's intra-day facilities. RIX participants that are also monetary policy counterparts are also entitled to use the Riksbank's standing facilities and its weekly repos. However, to be able to take part in the weekly repos, the monetary policy counterparty must have signed a special repo agreement with the Riksbank. In

addition to intra-day facilities, standing facilities and weekly repos, primary monetary policy counterparties also have access to the fine-tuning operations.

### *Intra-day facilities (intra-day credits) – for RIX participants*

Banks participating in RIX are able to borrow from the Riksbank interest-free during the day against collateral in securities. A loan of this type is called an intra-day credit (intra-day facility). The value of the securities after any deductions that may have been made during valuation (hair cut) sets the borrowing ceiling. This is the maximum limit for the size of the credit the counterparty may be granted at the Riksbank during the day. The intra-day facility is the fastest way of acquiring liquidity, as long as there are sufficient collaterals. The credit is provided more or less instantaneously. The facility will be needed mainly from when RIX opens until the early afternoon when the surpluses and deficits in the banks' transaction accounts have been determined.

When there is not enough collateral for the borrowings from the Riksbank via RIX during the day, certain banks have an informal agreement by which they can provide each other with "interest-free" intra-day credits. The counterparty limits set the ceiling for how much the banks

<sup>34</sup> For more information on the Riksbank's counterparties, go to [www.riksbank.se](http://www.riksbank.se).

are allowed to lend each other. However the banks have rarely needed to turn to each other for intra-day credits.

*Fine-tuning operations – for primary monetary policy counterparties*

At the end of the day, the banking system as a whole (all participants in RIX) may have a deficit or surplus vis-à-vis the Riksbank. The primary monetary policy counterparty that is responsible for this surplus or deficit may participate in the Riksbank's fine-tuning operations.<sup>35</sup> The counterparty that is responsible for the final deficit in the banking system at the end of the day and that needs to borrow from the Riksbank overnight pays the Riksbank's repo rate plus 10 basis points for this loan. If at the end of the day, the banking system instead generates a surplus, the counterparty holding this surplus may deposit the amount with the Riksbank overnight. The counterparty then receives the Riksbank's repo rate less 10 basis points. Whether the banking system closes with a deficit or surplus may vary from one day to another. Similarly, the counterparty that ends up with the final deficit or surplus, and thus

that needs to implement the fine-tuning mechanism, will also vary.

The Riksbank fine-tunes the relative positions of the banking system vis-à-vis the Riksbank (virtually) every day. The amounts that are fine-tuned by the Riksbank are very small, relative to the volumes of deposits and repos on the overnight market. This is because the Riksbank offers poorer interest terms than can be arranged between the participants. In 2006, lending at the Riksbank via fine-tuned operations averaged SEK 400 million per day. The daily average borrowings totalled roughly SEK 300 million. The greatest amount of fine-tuning takes place in connection with the Christmas and New Year holidays. At that time, the period of maturity for the monetary policy repo (see below) is longer than normal. At the same time, large deposits and withdrawals of notes and coins take place.

*Standing facilities – for monetary policy counterparties*

It may happen that the transaction accounts of the individual banks at the Riksbank are not balanced when RIX

<sup>35</sup> Fine-tuning is carried out because on some days the actual outcome of borrowing and deposit needs of the banking system from the Riksbank may differ from the forecast made by the Riksbank for the period of maturity of the monetary policy repo. This difference may result from the fact that the Riksbank's forecast of the borrowing and deposit needs of the banking system is made for the entire term of the repo and not for particular days, or may be the outcome of erroneous assumption made during the forecast.

closes, although the banking system as a whole is in balance. If so, any deficits or surpluses are placed in the Riksbank's standing facilities overnight. Even smaller amounts are involved than in the fine-tuning operations. In the standing facilities, the counterpart is in fact required to pay the Riksbank's repo basis rate plus 75 basis points for an overnight loan. Conversely, an overnight deposit pays a return at the Riksbank's repo basis rate less 75 basis points. During 2006, the average deposit in the Riksbank at the rate of interest for this facility amounted to less than SEK 100 million per day. The average lending totalled around SEK 24 million per day. Peaks in deposits and troughs in borrowing are normally the result of the Riksbank's primary monetary policy counterparties choosing not to participate in fine-tuning. This situation can arise when the added cost of deposits in or borrowing from the Riksbank at fine-tuning interest rates is considered to be lower than the banks' administrative costs for participating in liquidity balancing.

*Monetary policy repos – for monetary policy counterparties<sup>36</sup>*

The Riksbank ensures that the banking system as a whole has access to

loans against collateral in securities via its weekly monetary policy repo.<sup>37</sup> The Riksbank makes a forecast for the banks' total liquidity needs for the week ahead. When the volume of the repo has been advertised, the banks (monetary policy counterparties) can submit a bid for the required allocation.<sup>38</sup> Normally, the size of the repo is around SEK 2–3 billion. The lowest bid allowed by the Riksbank is SEK 200 million and the highest SEK 5 billion. The interest rate paid by the banks to the Riksbank for the loan is equal to the Riksbank's repo basis rate. Whether or not a particular bank submits a monetary policy repo bid will be determined by the liquidity needs of the bank (or its customers). Because the Riksbank's method of allocation means that banks with a need for liquidity are rarely allocated the full amount of their bid,<sup>39</sup> bids are usually made for the maximum amount allowed, SEK 5 billion. The banks' bidding tactics ensure that they are allowed to borrow the maximum possible relative to the percentage allocation determined by the Riksbank. This is desirable because interest on this loan is relatively low. In 2006, the banks were awarded on average 15.6 per cent of their bids.

<sup>36</sup> However, the monetary policy counterparty must have signed a special repo agreement with the Riksbank to be able to take part in monetary policy repos.

<sup>37</sup> Not to be confused with the above-mentioned repos/repurchase agreements.

<sup>38</sup> The amount of the monetary policy repo is to a large extent determined by changes in the public's demand for notes and coins.

<sup>39</sup> The allocation to each bank is made by multiplying the Riksbank's allocation percentage by the bank's bid. The allocation percentage is calculated by dividing the size of the monetary policy repo by the total of the bids from the banks.

## DERIVATIVES IN THE FIXED-INCOME MARKET

The fixed-income market comprises various types of derivative instrument, including *interest rate forwards*, *interest rate swaps* and *interest rate options*. Other variants of derivatives include *credit derivative* and *structured products*.

### *Interest rate forwards*

A forward is a contract whereby the parties have undertaken to buy/sell an asset at a predetermined price. The most common derivative instruments in the Swedish fixed-income market are *International Money Market Forward Rate Agreements (IMM-FRAs)*. These are standardised interest rate forwards that have deposit contracts as the underlying asset and specific maturity dates known as IMM days.<sup>40 41</sup> Statistics on turnover in IMM-FRAs refer mainly to the trade conducted on ONBS. Turnover in IMM-FRAs among the Riksbank's primary monetary policy counterparties averaged SEK 65 billion per day during 2006. Turnover during 2006 rose by on average around SEK 20 billion per day.

Other forwards in the Swedish fixed-income market consist of *forward contracts* on bonds and *Treasury bills*. These contracts are binding agreements to buy or sell government or mortgage bonds, or Treasury bills at a specified date in the future. Relative to the estimated turnover on IMM-FRAs, the market in bond and Treasury bill forwards is not especially large. The average turnover in forwards on government bonds was around SEK 15 billion per day in 2006, an increase of SEK 4 billion per day on average since the preceding year. The turnover in forwards on mortgage bonds averaged just under SEK 2.5 billion per day in 2006, an increase of around SEK 500 million per day on average since the preceding year. The turnover in the Treasury bill forwards averaged SEK 1 billion per day in 2006, a fall of SEK 500 million on average per day over the past year. However, from a longer-term perspective, the turnover in Treasury bill forwards has more than halved since 2000. The likely explanation for the decline in turnover in Treasury bill forwards over the years is to be found in the gradually growing use of IMM-FRAs.

<sup>40</sup> IMM days always fall on the third Wednesday in March, June, September and December.

<sup>41</sup> When a contract for an IMM-FRA matures, the underlying instrument (the deposit contract) is not exchanged, however. Instead, there is a cash settlement between the agreed interest rate at the time of entry into the contract and the market rate when the contract matures.

### *Interest-rate swaps*

*Swaps* are another type of derivative in the fixed-income market. An interest rate swap is an agreement between two parties to exchange interest payments over a specific period of time. For example, one party can choose to pay a fixed rate of interest in exchange for a variable rate. Interest-rate swaps with long maturities are referred to by their abbreviation IRS and involve the exchange of interest rate payments over several years. Another type of interest rate swap – with shorter maturities – used in Sweden is known by the acronym STINA (*Stockholm TomNext Interbank Average*). A STINA contract is an agreement, over a period of up to one year, to pay/receive the difference between an agreed fixed rate of interest and a variable overnight rate. The turnover in STINA swaps among the Riksbank's primary monetary policy counterparties totalled around SEK 11 billion on average per day during 2006.

### *Interest-rate options*

An *option* in the fixed-income market is a contract whereby the holder has the right, but not the obligation, to buy or sell a debt security at a specified price and on a specified date in the future. In turn, the writer of the option has the obligation, but not the right, to exercise the contract. In Sweden, trade is conducted in *government bond options*, where the underlying financial asset is a government bond. The turnover in government bond auctions fell sharply between the years 1998 and 2003, from around SEK 500 million on average per day to just over SEK 36 million. However, over the following years, this trade rose to around SEK 130 million per day in 2006. Nevertheless, this remains a modest level of turnover relative to other interest-rate derivatives.

One type of derivative instrument that has become more common in recent years is *structured products*. In most cases, these instruments combine securities with various types of options. One of the most hotly debated instruments in the category of structured products is known as *credit derivatives* (see the fact box on credit derivatives).<sup>42</sup>

Trade in credit derivatives and structured products has up to now been more highly developed internationally than in Sweden. The Riksbank is not currently collecting statistics on turnover in these instruments from its counterparties.

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<sup>42</sup> More information on credit derivatives and structured products will be found in the book "Penningmarknaden", Nyberg, Viotti and Wissen 2006, and in the publication "Financial Stability 2006:2", Sveriges riksbank 2006.



## Credit derivatives

The international trade in credit derivatives has grown dramatically during the 2000s, although the volume of trade remains relatively modest in Sweden. Credit derivatives have made it simple and cheap to trade in credit risk. This has enticed institutional investors such as insurance companies, hedge funds and pension funds to invest in credit derivatives.

Credit derivatives are linked to the credit risk of the underlying asset, usually corporate bonds. To buyers of credit protection, credit derivatives work more or less like an ordinary insurance policy. The seller of the credit protection undertakes to compensate the buyer if the underlying bond is affected by a credit event during the term of the contract. In return, the buyer pays a regular premium that reflects the credit risk in the asset. What represents a credit event is defined in the contract and may include bankruptcy and suspension of payments on outstanding debt.

The most commonly used instruments in the credit derivative category are credit default swaps (CDS). These are linked to an underlying asset, normally a corporate bond. If a credit event occurs, the contract requires the seller to take ownership of the bond at its nominal amount – despite the fact that the credit event may have made the bond worth-

less. The premium for a CDS contract is based on the interest differential between the underlying corporate bond and a risk-free bond with a similar maturity, since both reflect the market's perception of the underlying risk of default. Thus, the market value of a CDS contract varies according to the market's estimation of the probability of different credit events. The most important buyers of credit risk in the credit derivatives market are major institutional investors such as insurance companies and pension funds. The main net sellers of credit risk are banks, mortgage institutions and other credit institutions wishing to unburden themselves of aspects of their credit risk.

CDS contracts issued against individual corporate bonds are the most common type of credit derivative. However, growth is highest in other categories of products, including index-linked products and *synthetic CDOs*. The CDS Index reflects changes in a portfolio of CDS contracts. The advantage of index-linked products is that they offer more scope to investors to make diversified investments in the credit market. Liquidity is high in the index of standardised contract structures.

In Sweden, the number of transactions executed has risen in recent years, although the total number of exposures is generally low. The major explanation

for the limited use of these instruments in Sweden is that the market in corporate bonds in Sweden is small. This impacts on the trade in credit derivatives, since the latter are mainly based on corporate bonds as the underlying asset. With the

paucity of corporate bonds on offer, in combination with weak demand from customers, Swedish banks have up to now had little reason to develop a market for credit derivatives in SEK.

### *Trading structure in market for interest derivatives*

Derivatives can either be traded direct, "over the counter" (OTC), between a buyer and a seller or via an organised exchange. On exchanges, trading in derivatives is standardised, with known maturity dates and contract sizes. Derivatives traded off organised exchanges may either be standardised or tailored to suit the buyer's or seller's requirements. Liquidity is generally better in exchange-traded derivatives. In Sweden, derivatives in the fixed-income market are mostly traded OTC and are very often of the standardised type. Some of these OTC derivatives are cleared by ONBS, which then takes the role of clearing counterparty vis-à-vis buyer and seller.<sup>43</sup> The active trade in derivative instruments is conducted in a market where a number of market makers set prices by telephone or electronically.

### The foreign exchange market

Another important financial market is the foreign exchange market. What we normally call the foreign exchange market is a worldwide market. This is characterised by the large amounts involved, a large number of participants, low transaction costs and fast dissemination of price information. The global turnover in this market every day involves sums corresponding to tens of thousands of billions of SEK. In this section, the term "the *Swedish* foreign exchange market" mostly refers to foreign exchange transactions that take place in this global market, where one part of the transaction consists of Swedish kronor (SEK). The Swedish foreign exchange market may also be defined as the trade in (all) currency pairs that is performed by institutions in Sweden, and so an account is provided according to that definition at the end of this section.

One reason why participants exchange Swedish kronor for foreign currency and vice versa is to match revenue and disbursements in foreign currency. These payments may be generated for instance by trade in goods and services. Another common reason is to obtain protection against the foreign exchange risk that arises during trading in foreign debt securities. Foreign exchange derivatives may be used to avoid risk of this kind. The close link between the fixed-income and foreign exchange markets is explained in the fact box below.

Swedish kronor may be exchanged either by *spot transactions*, when delivery normally takes place after two days, or via a derivative instrument, when delivery takes place at some other agreed time. (See

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<sup>43</sup> For more details, see the chapter *The financial infrastructure*.

the section on frequently used instruments in the Swedish foreign exchange market, below.)

Even if the major share of turnover, calculated as *amounts*, takes place in the foreign exchange market, it may be worth mentioning that a large share of the *number* of foreign exchange transactions is usually *not* conducted in this foreign exchange market. This is because banks and enterprises that operate internationally neutralise a large share of their income and expenditure in foreign currencies internally. For example, a sale in EUR can be balanced against purchases of goods in EUR. In this way a company can, for example, minimise the hedging it needs. *Netting*, as this is called, does not generate any flows in the foreign exchange market, however, but offers a method for dealing with transactions in foreign currency without requiring an exchange transaction for each and every one of them. When a bank or company needs to reduce or raise the amount of foreign exchange in its account with a foreign bank, they normally turn to the institutionalised foreign exchange market.

The following section describes the instruments most commonly used in the trade in SEK and the structure of trading in the foreign exchange market. An account is then provided of the turnover in the Swedish foreign exchange market from two separate perspectives.

*Frequently used instruments in  
the Swedish foreign exchange market*

In foreign exchange transactions in which SEK is one of the currencies involved, the following instruments are frequently used.

Spot

The definition of "spot" is "a system of trading in which commodities are delivered and paid for immediately after a sale".<sup>44</sup> However, in the foreign exchange market, payment and delivery in a foreign exchange transaction in practice take place two banking days after trade date. Transactions involving both longer and shorter maturities are considered derivative transactions.

Derivatives

Derivate instruments are used, for example, as a means of spreading and managing risks. The choice of derivative instrument is made according to the purposes of the participants. Derivative instruments traded in the foreign exchange market include *foreign exchange for-*

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<sup>44</sup> Concise Oxford Dictionary, 11th edition.

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## Covered interest rate parity

There is a close connection between the fixed-income and the foreign exchange markets through the foreign exchange derivative market. One effect of this connection is to provide two options to major Swedish participants when borrowing money. They may choose – at the same interest cost – either to issue securities in Sweden or to issue securities abroad and then convert the loan to Swedish kronor using currency derivatives. The reason for this is that exchange rates in the spot and forward markets are affected by interest rates in the respective countries. In other words, the spread of interest rates between two countries is reflected in the price difference between the spot and forward price for the currency pair of the two countries. This link is usually referred to as *covered interest rate parity (CIP)*.

If, for example, a Swedish company has to make a payment in USD in three months, the company can choose between two equivalent alternatives: it can

either purchase USD for SEK today and invest these USD at US interest rates for three months (for example by buying US government securities) or it can invest SEK at Swedish interest rates for three months and at the same time purchase dollars forward, i.e. with delivery and payment in three months at a price in SEK that is known today.

Any difference in prices between these two options would provide risk-free opportunities for arbitrage, which would immediately be taken up by participants in the market. As a result, the prices on the fixed-income and foreign exchange markets will be adjusted in such a way that interest rate parity prevails. This relationship also enables major Swedish participants to borrow abroad and then, using foreign exchange derivatives (above all, foreign exchange swaps) to convert their foreign currency loan to SEK. By using the arbitrage correlation, it is possible to borrow SEK at the same cost in Sweden as abroad.

wards, foreign exchange swaps, interest rate and currency swaps, and foreign exchange options.

*Foreign exchange forwards* are used by companies to hedge currency risks during handling payments to and from abroad. A foreign exchange forward is an undertaking to purchase/sell the currency in the future on a set date and at a set price.

One of the most commonly types of contract used in the foreign exchange market is *foreign exchange swaps* (FX swaps). These instruments work as an agreement to buy currency in the spot market and sell it back on a specific date in the future in the forward market. They could be regarded as the counterparts of the money market's repos. After all, a repo also consists of a spot and a forward transaction that are linked to each other. However, in the fixed-income market, it is a security, not a currency, that is sold and repurchased at a later date. (See the section on the money market's shortest segment). FX swaps can be classified according to maturity: short swaps with maturities of up to one week and longer swaps with maturities of more than one week and up to (normally) one year, or longer. Short swaps are normally used to manage liquidity while longer swaps are pivotal instruments for the banks in their pricing of interest rate spreads for different currency pairs.

*Interest rate and currency swaps* are another type of contract that is also a combination of transactions. An interest rate and currency swap is an exchange of interest payments in two currencies, for example Swedish interest against euro interest, and, where appropriate, exchanges of capital amounts (at the beginning and end of the period). A swap of this kind normally has a maturity of more than one year.

Options are also traded on the foreign exchange market. These are known as *foreign exchange options*. Option transactions in the foreign exchange market are structured in the same way as in the fixed-income market, with the difference that the underlying asset is a currency pair.<sup>45</sup> Foreign exchange options may be used, for example, to reduce the foreign exchange risk in future transactions. The buyer of a foreign exchange option has the opportunity, but not the obligation to exercise the option on the date that the payment falls due. If the market price is more advantageous than the foreign exchange rate at which the option entitles the holder to buy, the buyer will probably decide not to exercise the option.

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<sup>45</sup> See description in the section on derivatives in the fixed-income market.

### Trading structure

Trading in SEK does not differ significantly from trading in other currencies in the foreign exchange market. As a result, this account may be considered to apply to the foreign exchange market in general.

Transactions in the foreign exchange market are conducted by market makers, who on request quote bid and ask prices via an electronic system or telephone. Like fixed-income derivatives, foreign exchange derivatives in SEK are only traded OTC.<sup>46</sup> A standard spot transaction involving the EUR/SEK currency pair is EUR 5 million.

### Interbank trade and customer trade

Of the trade in the foreign exchange market, just over half of the volume of turnover consists of what is called interbank trade.<sup>47</sup> This refers to trade between participants (market makers) who are dealers in various instruments. These dealers may be banks or securities companies.

Interbank trade is often, in turn, the result of *customer trade*, i.e. transactions between dealers and customers. Customers are, generally speaking, all participants other than dealers. If the customer, for example a Swedish company, needs EUR to execute a payment today, it will request its bank, which will quote an EUR rate. If the bank wants to restore its foreign exchange allocations to the position before the sale of EUR, it will buy EUR for SEK from another bank. This transaction between the two banks gives rise to further interbank trade.

The pricing of currency is largely determined in the interbank market, where bid and ask prices are regularly listed for different currencies against SEK. The prices that are quoted to Swedish customers are therefore very often a result of pricing in this market.

### Electronic trade

Foreign currency trading is increasingly shifting from telephone trading to order-driven trading using different electronic platforms and systems. When a participant finds an attractive rate it can immediately accept the rate by pressing a buy or sell key. As a result, an order may be immediately entered into the system.

Roughly 85 per cent of the spot trade in SEK between the Riksbank's counterparties is performed via electronic systems. Most SEK trading is conducted via systems such as Reuter Dealing 3000. Most of the major currency pairs (such as EUR/USD, GBP/USD, USD/JPY and EUR/JPY) are traded via EBS (Electronic Broking System). As for

<sup>46</sup> See description in the section on the fixed-income market.

<sup>47</sup> Source: Bank for International Settlements (BIS).

interbank trading in foreign exchange derivatives, the situation is somewhat different. There, about one-third of derivative transactions are electronic. However, the proportion varies according to the type of derivative instruments traded.

In the trading conducted by the Riksbank's counterparties on behalf of their customers, including major companies, many of the major banks use their own, in-house developed electronic platforms. These are called *single-bank platforms* and quote the customer rates only from the bank itself. There are also *multi-bank platforms* (such as FX-all) in which several banks participate. These quote the customer rates from several banks, enabling the customer to compare rates. Just over 40 per cent of customer trade takes place using electronic systems.

Just as in trading in equities and fixed-income instruments, *black box* trading has become increasingly common in the foreign exchange market. Here, decisions on currency positions are taken by computers rather than people. The computers are programmed to monitor market movements and take positions accordingly. One popular strategy in the foreign exchange market has been to allow interest-rate differentials between countries to determine investments. In that strategy, the computer system is programmed to borrow in low-interest countries and invest in high-interest countries. In the foreign exchange market, these transactions are known as *carry trades*.

#### Cross-trading

Trading in currency usually takes place via one of the largest currencies. In the case of SEK, this means that the price relative to other currencies is set via the euro, which is what is known as a *hub currency*. Before the introduction of the euro, cross-trading spot-prices for SEK were set in relation to the German mark (DEM). As a result, the price of SEK against, for example, the Norwegian krone (NOK) is calculated via the euro. So, by starting from the price for NOK against EUR and SEK against EUR, a price for SEK against NOK is obtained. This is usually called "cross-trading". Cross-trading is a practical arrangement, as the banks would otherwise need to price SEK against every imaginable currency. In smoothly operating markets, which currency is used for pricing is irrelevant, as long as the transaction costs are low. The reverse would create opportunities for risk-free profits, known as arbitrage. Then, the participants would be able to sell SEK at a high price against a currency and buy SEK back at a low price against another currency.



Unlike in spot trading, the hub currency for derivative trading in SEK against other currencies is not EUR but USD. Until the end of the 1960s the hub currency for forwards was the pound sterling (GBP).

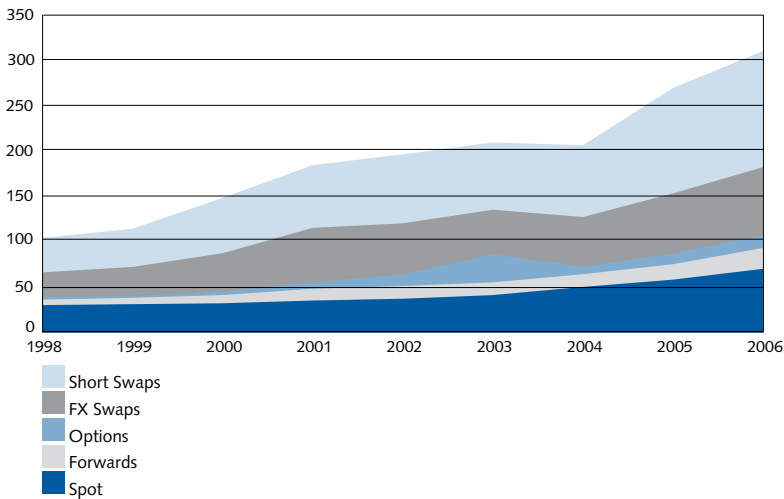
A number of market conventions applying to foreign exchange trading in SEK are described in Annex 2 as well.

### *Turnover in SEK*

There are no comprehensive statistics on turnover in SEK in the foreign exchange market. However, the Riksbank collect turnover statistics from its counterparties in foreign exchange transactions. These counterparties comprise the four major banks, plus seven large international participants.<sup>48</sup> According to a survey conducted by Bank for International Settlements (BIS) every three years – most recently in April 2004 – the Riksbank’s counterparties account for around three quarters of the global turnover in SEK.<sup>49</sup>

According to the Riksbank’s statistics, trading among its counterparties, in which SEK was one component in the currency transaction, averaged around SEK 310 billion daily during 2006 (see Chart 9 below), representing a rise of SEK 40 billion per day since the preceding year.<sup>50</sup>

**Chart 9. Average daily turnover in Swedish kronor SEK billion**



Source: The Riksbank

<sup>48</sup> The Riksbank’s counterparties in foreign exchange transactions in 2006 were ABN AMRO Bank, Ca-lyon, Citibank N.A., Danske Bank, Deutsche Bank, JP Morgan Bank, Nordea, SEB, Svenska Handelsbanken, Swedbank and UBS.

<sup>49</sup> “The Triennial Central Bank Survey”, Bank for International Settlements (BIS), April 2004.

<sup>50</sup> Only one element of the swap transactions is included in these figures.

Of this, the daily turnover in spot transactions averaged around SEK 70 billion in 2006, an increase of SEK 12 billion per day compared to the preceding year. The turnover in foreign exchange forwards in SEK at the Riksbank's counterparties in 2006 totalled approximately SEK 23 billion per day. This represented an increase of around SEK 6 billion compared to the figure for 2005.

The turnover in foreign exchange swaps in 2006 totalled approximately SEK 200 billion per day, an increase of around SEK 20 billion per day on the 2005 figure. Of the total, the turnover in short swaps<sup>51</sup> – with maturities of up to two days – accounted for around SEK 128 billion per day, compared to roughly SEK 116 billion per day in 2005. The turnover in longer swaps, with maturities of between two days and 18 months,<sup>52</sup> totalled around SEK 75 billion per day (compared to around SEK 66 billion per day in 2005).

The turnover in foreign exchange options among the Riksbank's counterparties increased marginally during 2006, by on average around SEK 2 billion per day, to in all approximately SEK 14 billion per day.

The Riksbank does not collect statistics on the turnover in interest rate and foreign exchange swaps among its counterparties, but according to the BIS survey mentioned above, average turnover totalled around SEK 400 billion per day in April 2004.

According to the BIS survey, nearly two thirds of the trade in SEK took place outside Sweden in April 2004 and 34 per cent was traded by banks based in Sweden. Banks based in the United Kingdom accounted for 29 per cent of the turnover. There may be several explanations for this major foreign participation in trade in SEK. To begin with London is the dominant financial centre for the global foreign exchange market and many of the largest banks are based there. In addition, the SEK attracts interest outside Sweden as an alternative currency to the euro. This provides participants with an option for spreading their currency risks (diversification).

Spot and forward trading account for the greatest amount of trading in London, while in Stockholm FX swaps predominate. Other countries where there is extensive trading in SEK are the USA (13 per cent), Denmark (10 per cent) and Germany (5 per cent).

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<sup>51</sup> Known as overnight and tomorrow next swaps.

<sup>52</sup> This is the definition of short and long foreign currency swaps used by the Riksbank in collecting turnover statistics. The distinction made by participants in the market with regard to maturity periods for foreign exchange swaps are described in the section on derivatives.

### *Foreign exchange in Sweden*

In the above, we have been describing the Swedish foreign exchange market defined as all the foreign exchange trading where SEK forms one element of the transaction, wherever in the world the transaction takes place. An alternative definition of the Swedish foreign exchange market is all the foreign exchange takes place in Sweden, irrespective of the currency pairs involved. One issue examined in the BIS survey previously cited was the foreign exchange undertaken in April 2004 by the four major Swedish banks based in Stockholm. According to the survey, Stockholm is the 13th largest trading venue in foreign exchange in global terms. Since 1989, foreign exchange trading in Stockholm has grown by around 6 per cent annually, from an average corresponding to USD 13 billion per day in 1989 to an average of USD 31 billion per day in 2004. However, foreign exchange trading in Stockholm has expanded somewhat more slowly than the global foreign exchange market overall (which grew by 8 per cent annually between 1989 and 2004).

The currency pair with the highest turnover in Stockholm is USD/SEK. Its share of total turnover has risen somewhat, from 28 per cent in 1995 to 31 per cent in 2004 (see Table 3, below). A reason for this is that FX swaps are traded relatively frequently in Stockholm, and USD is the hub currency for transactions in these instruments. The currency pair with the next highest turnover is EUR/USD, representing 16 per cent of trading in Stockholm during 2004. The third-largest currency pair is EUR/SEK. In 2004, this pair accounted for 11 per cent of the trade in Stockholm. Further down the line, the ranking of the most frequently traded currency pairs in Stockholm varies from year to year.

The largest single currency traded in Stockholm in April 2004 was not the SEK but the USD, which was one of the currencies in 34 per cent of all the currency pairs traded. It was followed by the SEK (nearly 30 per cent) and the EUR (around 17 per cent).

**Table 3. The six currencies most frequently involved in foreign exchange in Stockholm**  
Per cent

	1995		1998		2001		2004	
1	USD/SEK	28	USD/SEK	28	USD/SEK	33	USD/SEK	31
2	DEM/USD	19	DEM/USD	16	EUR/USD	14	EUR/USD	16
3	DEM/SEK	18	DEM/SEK	7	EUR/SEK	12	EUR/SEK	11
4	USD/CHF	4	USD/JPY	4	GBP/USD	4	GBP/USD	5
5	DEM/FRF	2	GBP/USD	2	USD/JPY	3	USD/JPY	2
6	USD/JPY	2	GBP/SEK	2	GBP/SEK	1	USD/CHF	2
	Others	27	Others	40	Others	32	Others	33
	Total	100	Total	100	Total	100	Total	100

Source: BIS

Note. The figures represent the month of April.

## Financial intermediaries

The financial system includes various kinds of middlemen known as *intermediaries*. These can be classified in different ways. In this report, they are divided into *credit institutions*, in the form of banks and credit market companies, *investors*, in the form of insurance companies, pension funds and fund management companies, and *securities companies*, whose roles include acting as brokers and market makers in the financial markets. Recently, a new type of intermediary has started to play a more significant role in providing risk capital, namely *private equity investment companies*. As a result, a special section will be devoted to these operators.

Several different kinds of intermediary are often included in one and the same group. For example, it is quite common for a financial group to include a bank, a mortgage institution, an insurance company and a fund management company. This is because the major Swedish banks have long sought to fulfil the role of universal banks. The basic idea of a universal bank is to be able to provide products and services across the entire financial sector.

**Table 4. Division of business activities in the Swedish banking groups**

PARENT COMPANY	BANK	MORTGAGE INSTITUTION	FUND MANAGEMENT COMPANIES	INVESTMENT BANK	LIFE INSURANCE COMPANY	FINANCE COMPANY
Nordea AB	Nordea Bank AB	Nordea Hypotek AB	Nordea Fonder AB	Nordea Investment Management AB	Nordea Liv and Pension AB	Nordea Finans AB
Svenska Handelsbanken AB	Svenska Handelsbanken AB	Stads-hypotek AB	Handelsbanken Fonder AB	Handelsbanken Markets. not a special company but a business division in the group	Handelsbanken Liv AB /SPP Livförsäkringar AB	Handelsbanken Finans AB
Skandinaviska Enskilda Banken AB	Skandinaviska Enskilda Banken AB	SEB Bolån AB <sup>1</sup>	SEB Fonder AB	Enskilda Securities AB	SEB Trygg Liv AB	SEB Finans AB
Swedbank AB	Swedbank AB	Swedbank Hypotek	Swedbank Fonder AB	Swedbank Markets, not a special company but a business division in the group	Swedbank Försäkring AB	Swedbank Finans AB/ Jordbrukskredit AB
Danske Bank A/S	Danske Bank A/S <sup>2</sup>	Provided by bank/ Bokredit AB	Firstnordic Fonder AB	Provided by bank	Danica AB	Nordania Finans
Skandia AB	Skandia-banken AB	Provided by bank	Skandia Fonder AB	Skandia Link Multifond AB	Livförsäkrings-aktiebolaget Skandia	-

Source: Annual reports by the banks

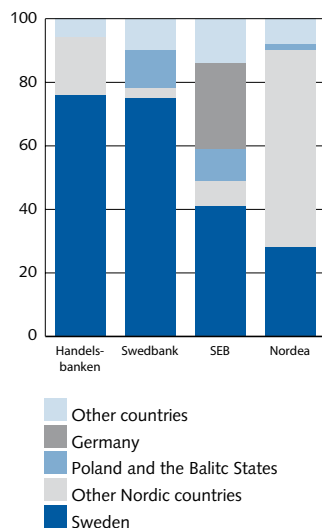
<sup>1</sup> As of July 2007, the business of SEB Bolån will be conducted within the bank and not as a separate subsidiary.

<sup>2</sup> Through Östgöta Enskilda Bank/province banks

To those who analyse financial companies, it is often advantageous to assess the corporate group as a whole, whether the perspective is that of an equity analyst or the supervisory authority. To gain an idea of the group's lending, it is not enough simply to look at the lending activities of the group's banking arm; it is also necessary to include the lending carried out by its mortgage institution and finance company. However, financial groups do not organise their businesses in identical ways. For example, two of the four major banking groups have their securities trading businesses in separate subsidiaries, while the others have opted to offer these services within the framework of the bank.<sup>53</sup> Table 4 provides an overview of the way in which business activities have been divided within the six most important financial groups in Sweden.

The operations of the financial groups are also becoming increasingly geographically diversified. The four major banking groups, in particular, have extensive activities outside Sweden, above all in the other Nordic countries. A geographical analysis of lending can provide a picture of where operations are conducted in each group. Lending represents around 60 per cent of the major banks' total assets. Today, lenders abroad account for half of total lending. However, there are clear differences among the different major banks. In the case of

**Chart 10. Lending by the four major banking groups, by geographical region**  
Per cent



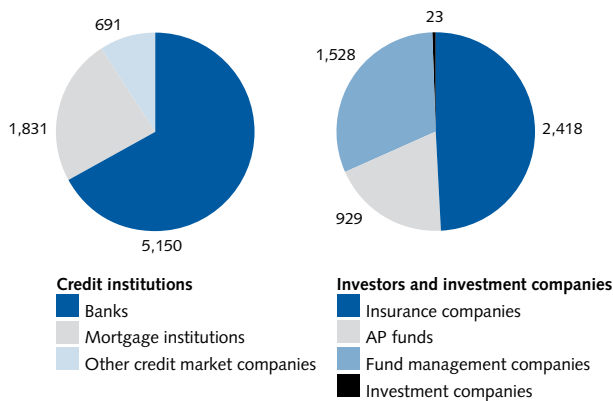
Sources: Bank's annual reports and Riksbank  
Note: SEB and Swedbank include credit institutions, while Handelsbanken and Nordea exclude credit institutions.

<sup>53</sup> The four major banks in Sweden are Swedbank, Svenska Handelsbanken, Nordea and Skandinaviska Enskilda Banken (SEB). In September 2006, Föreningssparbanken was renamed Swedbank.

Nordea, Sweden accounts for just over a quarter of lending, with the major share of the remaining credit volume being lent in the other Nordic countries. Handelsbanken and Swedbank have the major share of their lending in Sweden. Handelsbanken also has lending in the other Nordic countries. Swedbank and SEB operate in the Baltic countries. In addition, SEB has substantial lending in Germany. Chart 10 illustrates the geographical distribution of lending within the major Swedish banking groups.

With the ever-increasing diversification in the operations of the intermediaries and their steadily widening geographical spread, it is reasonable in some cases to describe these groups as a sum of the parts, as we have mentioned.<sup>54</sup> However, the following accounts will focus on their operations in Sweden, which follow the legal distinctions that apply. This means that banks, mortgage institutions, insurance companies, securities companies etc. are dealt with separately. Chart 11 provides an overview of the extent of the operations conducted in the most important categories of financial intermediaries. The pie chart on the left shows the total assets of the credit institutions, i.e. the total book value of the assets shown on their balance sheets. The chart on the right shows the total value of the assets managed by intermediaries such as insurance companies, fund management companies, the AP funds and securities companies.

**Chart 11. Total assets of the financial intermediaries and investment assets at year-end 2006**  
SEK billion



Sources: AP pension funds annual reports, Statistics Sweden, Swedish fund statistics and the Riksbank

Note. The diagrams show the balance sheet total for banks, mortgage institutions, other credit market companies and securities companies, while for insurance companies and the AP pension funds they show investment assets and for the fund companies they show the funds managed.

<sup>54</sup> More information on the four major banking groups will be found in the Riksbank's *Financial Stability Report*, which is issued twice a year.

## Credit institutions

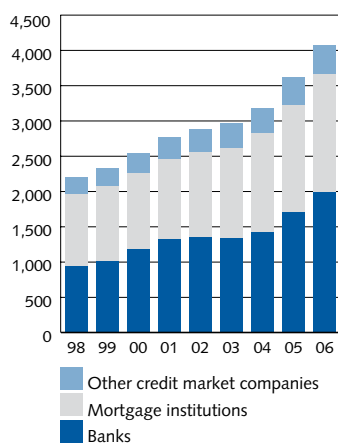
Credit institutions are specialists in assessing and monitoring credit risks, thanks to the often long-term relationships they have with their customers. Consequently, they play an important part in ensuring the supply of capital in the economy. Credit institutions include *banks* and non-bank credit institutions, in Sweden called *credit market companies*.

The banks have long played a key role among credit institutions. For example, the banks have traditionally had a monopoly on accepting deposits. These deposits, which can very quickly be converted into cash or payments, mean that the banks contribute to the supply of liquidity in the economy. However, the banks' monopoly on accepting deposits was abolished 1 July 2004, enabling credit market companies also to accept deposits from the public. As with the banks, these deposits are covered by the Swedish deposit guarantee scheme.<sup>55</sup>

Perhaps the most critical function of the banks in society is their role in the payments system (read more about the payment system in the chapter *The financial infrastructure*). The banks, for example, provide the accounts through which many payment transactions are made, plus a number of payment services associated with the transactions.

In general, credit market companies are specialist lenders within a particular area. Especially prominent among credit market companies are *mortgage institutions* and *finance companies*. Chart 12 shows a breakdown of lending to the public, between banks, mortgage institutions and other credit market companies.

**Chart 12. Lending by credit institutions to the public  
SEK billion**



Source: The Riksbank

<sup>55</sup> According to the Act that came into force on 1 July 2004, undertakings other than banks and credit market companies may, subject to certain conditions, also accept deposits from the public. However, these deposits are not covered by the deposit guarantee scheme. The purpose of the deposit guarantee scheme is to protect customers' deposits, in short notice accounts, of up to SEK 250,000 per customer per institution.

## BANKS

The banks are the largest group of lenders among the credit institutions. Of total lending by the credit institutions to the public, the banks account for nearly half. This is equal to approximately SEK 2,000 billion (see Chart 12). In the Swedish market, the four biggest banking corporations, Swedbank, Handelsbanken, Nordea and SEB, together account for nearly 80 per cent of the total assets of the banks (see Table 5).

In addition to limited liability banks, the Swedish market includes savings banks and co-operative banks. There are a large number of independent savings banks in Sweden. These are usually small, operating in regional or local markets. Unlike limited liability banks, savings banks lack equity capital and therefore have no shareholders. The profits of the business are therefore not distributed. Instead, any surpluses are retained in the bank as reserves. A co-operative bank is an economic association established to offer banking services on behalf of its members. The members of the bank are involved in the decisions that affect the bank's activities. Co-operative banks do not have shareholders either; the profits are re-invested in the business and can to a certain extent be distributed to the bank's members in the form of a bonus dividend. The Swedish market also includes subsidiaries branches of foreign banks.

At the end of 2006, a total of 126 banks were established in Sweden. These comprised 31 limited liability banks (of which four were foreign owned), 68 savings banks, 25 foreign-owned branches and 2 co-operative banks.

**Table 5. The ten largest banks and bank branches, total assets at year-end of 2006 SEK billion**

Handelsbanken	1 288
SEB	1 184
Nordea Bank	811
Swedbank	797
Danske Bank <sup>1</sup>	528
Länsförsäkringar Bank	64
Skandiabanken	56
Carnegie Investment Bank	39
GE Money Bank	35
Dexia <sup>1</sup>	24
<b>Total 10 largest</b>	<b>4 825</b>
<b>All banks</b>	<b>5 149</b>

<sup>1</sup> Foreign branches

Source: The Riksbank



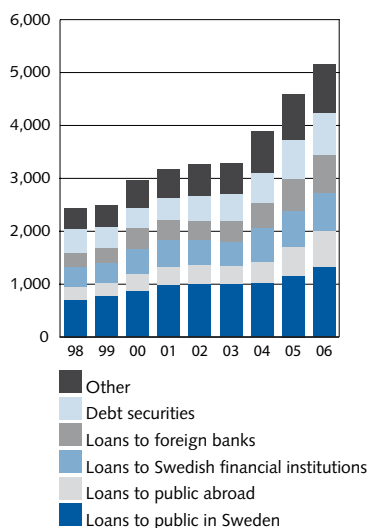
### The banks' assets

The banks' assets consist for the most part of lending to the public. At year-end 2006, this lending totalled SEK 1,995 billion, roughly half of total assets (see Chart 13). Approximately 40 per cent of lending to the public went to non-financial companies and around 20 per cent to households (see Chart 14).

In recent years, banking groups have been expanding their business into other countries by acquiring subsidiaries or establishing branches there. As a result of these foreign operations, lending to foreign borrowers has also increased in importance. At year-end 2006, a third of total lending to the public was to borrowers abroad.<sup>56</sup> The banks also have major claims on Swedish financial institutions.<sup>57</sup> These claims represented around 15 per cent of the banks' assets. In addition, around 15 per cent of the assets consisted of bonds and other interest-bearing securities.

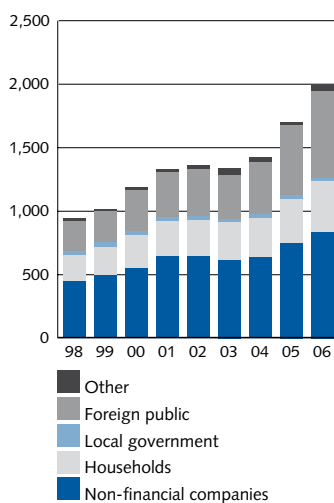
At year-end 2006, bank deposits from the public totalled SEK 1,731 billion. On the debit side, these deposits corresponded to approximately 35 per cent of the banks' liabilities (see Chart 15). Swedish households accounted for around 40 per cent of deposits from the public and Swedish non-financial undertakings for around 30 per cent

**Chart 13. The banks' assets  
SEK billion**



Source: The Riksbank

**Chart 14. The banks' lending to the  
public by borrower category  
SEK billion**



Source: The Riksbank

<sup>56</sup> However, this is a small portion of the lending to borrowers abroad. Loans made to subsidiaries are not included.

<sup>57</sup> The financial institutions comprise banks, finance companies and stockbroking firms.

(see Chart 16). The banks' liabilities to depositors abroad were just under a quarter of all deposits from the public. In addition, the banks had liabilities to both Swedish and foreign financial institutions in the form of securities issued and equity capital.

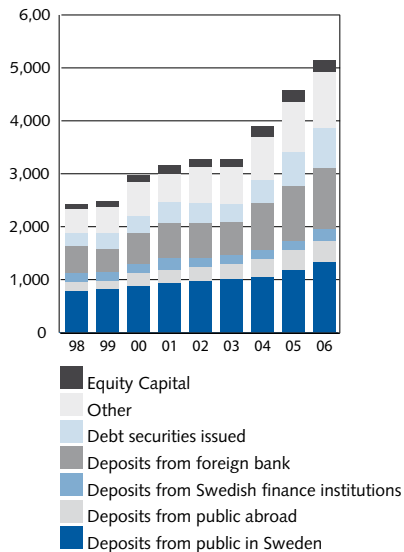
### MORTGAGE INSTITUTIONS

The primary purpose of the mortgage institutions is to finance real estate, in particular residential property. Loans are secured mainly by real estate mortgages or municipal sureties. State credit guarantees are also used. Lending by mortgage institutions constitutes just over 40 per cent of the total lending of the credit institutions.

There are in all eight mortgage institutions in the Swedish market. Five of these are part of a banking group.<sup>58</sup> SBAB and Venantius AB are owned by the State. Frispar Bolån is partly owned by SBAB, Sparbanken Finn and Sparbanken Gripen.

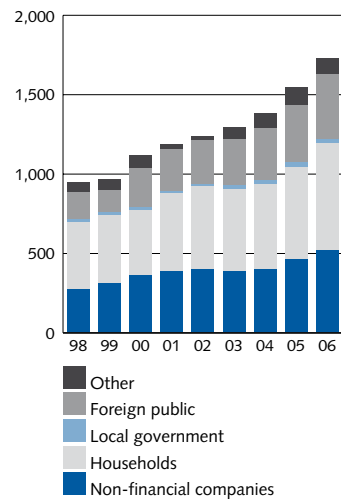
Stadshypotek and Swedbank Hypotek, which are owned by the Handelsbanken and Swedbank groups, respectively, are the largest institutions. Together, they account for approximately 59 per cent of the total assets held by mortgage institutions (see Table 6).

**Chart 15. The banks' liabilities and shareholders' equity**  
SEK billion



Source: The Riksbank

**Chart 16. The banks' deposits from the public, by lender category**  
SEK billion



Source: The Riksbank

<sup>58</sup> The four major Swedish banks and Danske bank.

At year-end 2006, lending by the mortgage institutions to the public amounted to SEK 1,663 billion. Lending for single-family dwellings and multi-family dwellings together represented roughly 85 per cent (see Chart 17). Lending for tenant-owner apartments has risen very sharply. It is now seven times the amount at year-end 1998. Contributory factors include both higher market prices and the conversions of rental properties to tenant-owned properties that have taken place during the period.

Interest rates on loans can be fixed, for different terms, or variable. The choice of fixed-interest period is affected by customers' expectations as to how short- and long-term interest rates will change. In December 2006, the percentage of new loans granted at variable rates was 54 per cent. Fixed-rate loans with terms of five years or

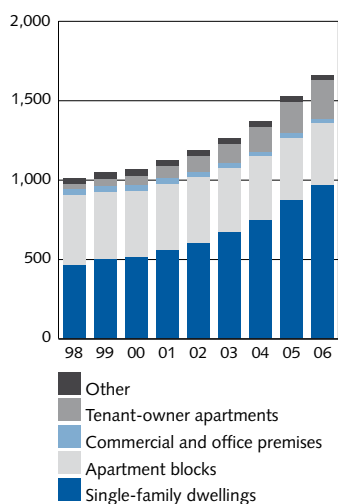
**Table 6. Mortgage institutions in Sweden, total assets and loans at year-end of 2006**  
SEK billion

	TOTAL ASSETS	%	LOANS	%
Swedbank Hypotek	567	31	479	29
Stadshypotek AB	491	27	480	29
Nordea Hypotek	285	16	283	17
SEB Bolån	211	12	210	13
SBAB <sup>1</sup>	210	11	154	9
Länsförsäkringar Hypotek	39	2	37	2
Frispar Bolån	18	1.0	17	1.0
Venantius AB	10	0.5	3	0.2
Summary	1,831	100	1,663	100

<sup>1</sup> Including SBAB's wholly-owned subsidiary the Swedish Covered Bond Corporation.

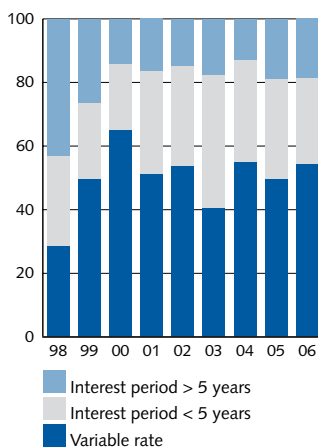
Source: Riksbank

**Chart 17. Lending by mortgage institutions to the public**  
SEK billion



Source: The Riksbank

**Chart 18. New lending by mortgage institutions according to the original fixed-rate term**  
Per cent



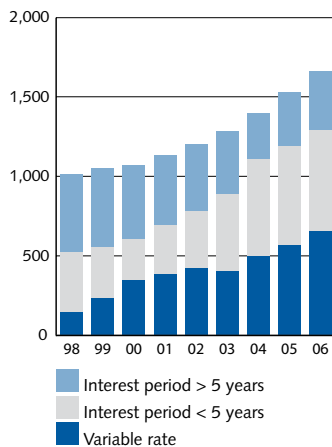
Source: The Riksbank

more and fixed-rate loans with shorter terms accounted for 19 per cent and 27 per cent, respectively, of total new loans (see Chart 18).

Of the mortgage institutions' total loan stock, the percentage of variable-rate loans increased markedly during the period 1998–2002. In 2003, however, the increase in the number of variable-rate loans came to a halt, but began to grow again in 2004–2006 (see Chart 19). The percentage of fixed-rate loans for five years or more has declined since 1998. From having accounted for half of the volume of the loan stock in 1998, the proportion of fixed-rate loans with terms of five years or more is down to around 20 per cent. At year-end 2006, about 40 per cent of total consisted of variable-rate loans. About 40 per cent of loans at fixed rates were for terms of up to five years while around 20 per cent had fixed rates for terms of five years or more.

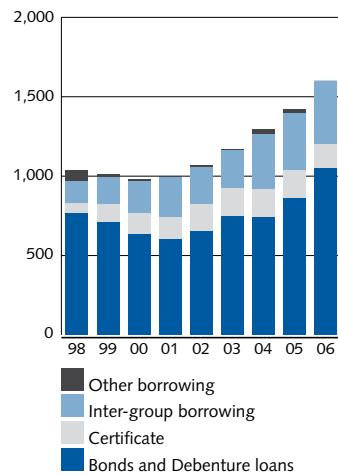
The mortgage institutions mainly finance the credit granted by issuing bonds and certificates (see Chart 20). These are purchased primarily by large asset managers, such as the AP funds, the insurance companies and the banks. Borrowing by the bank-owned mortgage institutions also consists in large part of loans from their parent bank. Mortgage institutions also borrow from domestic companies and households, for example by issuing private bonds. Another major share of borrowing takes place in foreign markets. At year-end 2006, more than 25 per cent of securities issued were in foreign currency.

**Chart 19. Loan stock of mortgage institutions according to original fixed-rate term  
SEK billion**



Source: The Riksbank

**Chart 20. Borrowing by mortgage institutions  
SEK billion**



Source: The Riksbank

Mortgage institutions endeavour to match the maturities of their assets and liabilities in order to limit interest rate risk. As the proportion of lending at variable rates increases, so too does the proportion of short borrowing via certificates and borrowing from group companies. In the same way, more bonds with longer maturities are issued when lending at fixed rates increases. In recent years, the mortgage lending institutions have to a certain extent used derivatives to match the terms of their assets and liabilities.

In 2006, borrowing through bonds and debenture loans rose by 22 per cent, while short-term borrowing rose by only 2 per cent.

#### OTHER CREDIT MARKET COMPANIES

Other credit market companies also include finance companies and companies that offer financing to corporations and municipalities. At year-end 2006, lending by these institutions comprised just over 9 per cent of total lending by credit institutions. Approximately one-quarter of the total assets of SEK 691 billion is attributable to the four major banking groups (see Table 7).

Before 1985, restrictions limited the scope of banks to lend money. By setting up finance companies, which were not subject to these restrictions, the banks became able to increase lending. Today, finance companies typically have specialist competence in various kinds of financing, for example leasing and factoring services for corporate customers and promissory note loans and credit card accounts to households. For administrative reasons, they still operate as independent companies within the banking groups.

Finance companies are also owned by non-financial companies. In such cases, they provide complementary services to normal operations through the financing facilities they can offer to customers. For

**Table 7. The ten largest companies in the category Other credit market companies, total assets at year-end 2006 SEK billion**

Svensk Exportkredit AB	230
Kommuninvest i Sverige	99
Handelsbanken Finans AB	52
Landshypotek AB	42
SEB Finans AB	37
Nordea Finans Sverige AB	36
Swedbank Jordbrukskredit	33
Swedbank Finans	26
AB Volvo Finans	24
GE Capital Solutions AB	9
Total 10 largest	590
Total other credit market companies	691

Source: The Riksbank

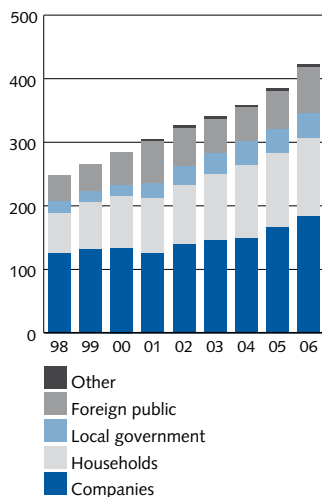
example, large car manufacturers often provide financing opportunities to purchasers.

Institutions offering financing to corporations and municipalities focus on granting loans to a particular sector. The largest of these institutions by far is Svensk Exportkredit (SEK), a mainly State-owned company charged with the task of fostering growth in the Swedish export industry. In addition, Kommuninvest i Sverige AB was established by a number of municipalities and county councils with a view to arranging financing for its members that is as cost-efficient as possible. Similarly, Landshypotek AB aims to provide its members (agricultural and forestry companies in Sweden) with financing on favourable terms.

The finance companies fund their operations mainly through loans from other financial institutions, in particular the banks. Some of the larger finance companies also obtain financing by issuing certificates in the securities market. The institutions offering financing for corporations and municipalities fund their activities by issuing bonds, certificates and promissory notes.

Outstanding loans to the public by other credit market companies amounted at the end of 2006 to SEK 422 billion (see Chart 21). Of these loans, 43 per cent were made to companies, while around 29 per cent went to households and 17 per cent to public borrowers abroad. There are 62 other credit market companies in the Swedish market, of which 54 are finance companies.

**Chart 21. Lending by other credit market companies to the public  
SEK billion**



Source: The Riksbank

## Private equity investment companies

Both established companies and those that are not yet ready for listing on the stock exchange or other forms of public trade in their shares can sometimes acquire funding in the form of private equity. This kind of finance has increasingly been channelled through a special type of intermediary, the private equity investment companies. Through private equity funds, they are able to own unlisted companies, known as *portfolio companies*.

Private equity investments may basically be categorised as investments in early phases of a company's life cycle, known as *venture capital*, and investments in later phases of the company's life cycle, known as *buy-out investments*. To simplify somewhat, early investments may in turn be divided into three different investment phases. Seed financing is financing to enable entrepreneurs to develop their ideas or products, which can lead to a company being started up. Start-up financing consists of financing to form a company and develop products. Finally, expansion financing allows existing companies to receive financing so that they can expand.

Investments in any of these early phases usually entail high risk. That is because in many cases they relate to nearly started companies with weak cash flows and few tangible assets. Banks do not normally contribute venture capital, as this does not lie within their business concept. Entrepreneurs wishing to develop an undertaking therefore have to seek another form of financing. They may borrow on their private assets, for example their house, or acquire capital for their business by allowing a private equity investment company to enter as a partner.

Buy-out investments normally entail a somewhat lower risk, since these involve mature companies with more stable cash flows and more tangible assets. They mainly consist of acquisitions of unlisted companies or buy-outs of listed companies from the stock exchange. The private equity investment company finances the acquisition partly by loans, preferably from banks. In this case, it is an acquisition funded by loans (Leveraged Buy Out (LBO)). A loan is then raised on the assets of the acquired company and the idea is to use the cash flow for interest payments and amortisation of the amounts borrowed.

What all private equity investment companies have in common, regardless of their investment approach, is that they invest for a limited period. The investment horizons of the private equity funds differ according to which investment phase the portfolio company is in. Seed financing generally represents the longest investment horizon, 10–12 years, while buy-out investments often have an investment horizon

of 5–8 years. In most cases, the private equity investment company plays an active, controlling ownership role, working closely with the executive management with a view to improving operating profit and cash flow, thereby increasing the value of the portfolio company. This applies regardless of the investment phase of the portfolio company. When the period ends, the company is divested (“exited”). Various exit alternatives are available to a private equity investment company: to sell to a purchaser in the industry, i.e. another industry company that wants to buy the portfolio company for reasons of synergy; to list the company (via an initial public offering, IPO); or to sell to another private equity investment company.

In Sweden the first private equity investment companies were established at the end of the 1980s. However, the sector has grown rapidly, especially in recent years. According to the Swedish Venture Capital Association (SVCA), 114 private equity investment companies, with a total capital of around SEK 320 billion, were operating in Sweden in 2006. The majority – nearly 75 per cent – of these focus on the buy-out segment. Roughly half of assets under management are invested in portfolio companies.<sup>59</sup>

Sweden invests just over 1 per cent of GDP in private equity via private equity investment companies. With the UK, Sweden ranks among the leading countries in Europe in private equity. Around 70 per cent of the capital in Swedish private equity funds is from foreign investors. Institutional investors such as pension funds, fund-in-fund managers and banks are predominant among the categories of investors.<sup>60</sup>

### Insurance companies, pension funds and fund management companies

Financial intermediaries also include a number of middlemen whose prime concern is not the provision of capital. Examples of these are insurance companies, pension funds and fund management companies. While each serves separate functions in the financial system and the economy, they all have an important role as investors in the financial markets. As investors, they concentrate more on managing other people's money than their own.

The insurance companies supply the general public with life and non-life assurance, and in turn invest the premiums they receive in the securities market. Insurance companies are specialists in handling and diversifying risks of various kinds. Non-life assurance enables the

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<sup>59</sup> Information from the Swedish Venture Capital Association. [www.svsa.se](http://www.svsa.se).

<sup>60</sup> *Ibid.*



public to manage risks associated with property. Pension insurance enables private individuals to assure their livelihood after retirement. Life assurance provides security for survivors on the early death of the assured. Life assurance products are therefore often regarded as a form of long-term saving.

Other forms of long-term saving are provided by the national pension funds and by private fund management companies. The national pension funds administer the assets the State has set aside to cover its pension undertakings, while fund management companies manage the public's savings in securities funds.

### THE INSURANCE COMPANIES

At year-end 2006, 361 Swedish insurance companies were operating in the domestic market. In addition, 31 foreign companies were operating through branches in Sweden. Most of the Swedish insurance companies are small, local non-life companies but the market is concentrated to a few major companies. In the life and non-life assurance markets, the five largest insurance companies/groups together account for 78 and 84 per cent of the market (see Table 8). In the life assurance market, 29 per cent of the investment assets belong to the four major banking groups.

The insurance companies are either limited liability companies that distribute their profits or companies run according to mutual principles. Companies run on mutual principles do not distribute any surpluses as dividend. They are instead passed on to the policyholders.

Insurance companies are divided into life assurance and non-life assurance companies. These businesses may not be carried on in the same company, although it is common to have both types of business

**Table 8. The ten largest life and non-life insurance companies in Sweden, investment assets at year-end 2006  
SEK billion**

LIFE INSURANCE COMPANIES	INVESTMENT ASSETS	NON-LIFE INSURANCE COMPANIES	INVESTMENT ASSETS
Alecta	420	AFA	186
Skandia (Liv + Link)	391	Länsförsäkringar	67
SEB Trygg Liv (Nya + Gamla)	298	If Skade	65
AMF Pension	263	Trygg-Hansa	30
Handelsbanken Liv + SPP	182	Folksam	22
Länsförsäkringar (Liv + Fondliv)	150	FPG	17
Folksam (Liv + LO + Fond)	83	Sirius Inter	14
Swedbank Försäkring	68	Brandkontoret	3
KPA (Liv + Pension + Fond)	45	SEB	2
Nordea Liv (I och II)	24	Moderna Försäkringar	2
Others	55	Others	31
Total	1,979	Total	439

Sources: The Swedish Insurance Federation and Statistics Sweden

in the same corporate group. Life assurance and non-life assurance companies both offer insurance against risk, although totally different types of risk.

Life assurance companies can pay out compensation when an insured person is unable to work, dies or reaches retirement age. The type of compensation offered by the insurance cover depends on how the policies are formulated. The products may be seen as insurance, but also as a form of long-term saving in which the policyholder has a claim on the capital managed by the insurance company. Life assurance can be divided up into traditional life assurance and unit-linked insurance. Traditional life assurance pays a guaranteed return while the yield from a unit-linked policy is determined by the performance of the individual funds. Saving in index-linked insurance works essentially in the same way as a saving in mutual funds (see the section on mutual funds).

Non-life assurance companies compensate damage to property and pay third-party damages. Policyholders pay a premium in order to receive compensation in connection with the insurance event. Unlike life assurance, non-life assurance policies are not a form of savings. The activities of these companies in the securities market take place in order to manage the companies' own funds.

Wage earners can also take out group insurance policies, which are based on labour market agreements. These provide additional cover in the event of sickness, occupational injury or retirement.

The assets of a dividend-paying limited liability life assurance company consist of investment assets. Their liabilities comprise primarily shareholders' equity and technical provisions. The technical provisions must correspond to the amount needed by the company to meet all the commitments that arise from the insurance contracts it has entered into.<sup>61</sup> Shareholders' capital consists of bonus funds, which are the insurance company's accumulated profits. In a dividend-paying limited liability insurance company, equity is owned by the shareholders and policyholders do not take on any financial risk. On the other hand, financial risk is assumed by the policyholders in a company operated on mutual principles, where they themselves "own" the equity.

The total investment assets of the nationwide life assurance and non-life assurance companies amounted at year-end 2006 to SEK 2,418 billion. Of these assets, the life assurance companies accounted for roughly 80 per cent (see Chart 22).

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<sup>61</sup> The size of the technical provisions is calculated using a number of factors, including expected return and life expectancy, estimates of future operating costs and premium income of contracts entered into, as well as the "maximum rate of interest", which is the discount rate used to calculate the present value of the company's future commitments.

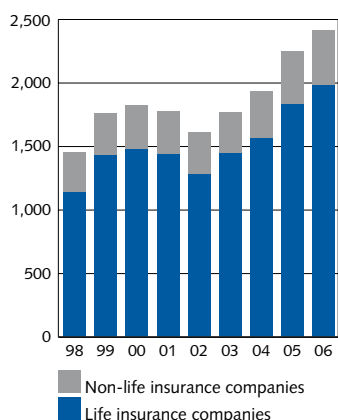
The investment assets of the insurance companies consist mainly of equities and bonds (see Chart 23). The percentage invested in equities fell during 2002, although it has risen over the past four years. In December 2006, equity accounted for 50 per cent of the assets under management. Holdings of bonds and short-term investments made up 39 per cent and 6 per cent respectively of assets under management. Investments in properties only accounted for a minor part and 30 per cent of the investment assets were foreign investments.

#### *Insurance associations and pension foundations*

In addition to insurance companies, insurance associations and pension foundations also provide insurance services. Compared to the insurance companies, these institutions represent only a small portion of the pension insurance market.

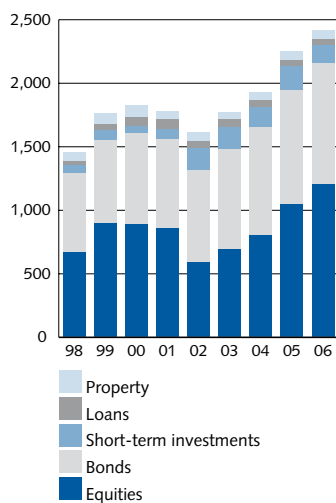
Insurance associations are associations that conduct insurance business on behalf of employees at one or more companies. Their activities are aimed at individuals in the same professional group or members of certain communities of interest. Most insurance associations only offer pension insurance, but a few also offer health insurance. At year-end 2006, 81 insurance associations were operating, with total assets amounting to around SEK 130 billion.<sup>62</sup>

**Chart 22. Investment assets of the insurance companies**  
SEK billion



Source: Statistics Sweden

**Chart 23. Allocation of investment assets by the insurance companies**  
SEK billion



Source: Statistics Sweden

<sup>62</sup> The majority of insurance associations conduct their own asset management, while some outsource asset management. The fact that some insurance associations outsource their asset management means that some overlapping exists in the reporting of data since these assets are also included in investment assets of fund management companies.

Pension foundations are another form of pension saving. An employer can choose to set up a pension foundation and transfer an amount to it each year, which is then later paid out to the employees in the form of pensions. A pension foundation is a legal entity in itself. At year-end 2006, approximately 2,400 pension foundations were operating in Sweden, with assets totalling around SEK 140 billion.<sup>63</sup>

#### FUND MANAGEMENT COMPANIES

Fund investment in Sweden totalled SEK 1,528 billion in managed capital at year-end 2006.

The funds are managed and administered by fund management companies. Generally, each fund management company can offer a large number of funds with a different investment focus. The Swedish fund management market is dominated by the bank-owned fund management companies. The four biggest fund management companies, owned by the largest banking groups, together account for nearly 70 percent of the market. In the case of these fund management companies, bank branches and Internet-based services act as distribution points.

**Table 9. The ten largest fund managers, assets managed at 2006-09-30 SEK billion**

Robur	370
SEB	239
Handelsbanken	198
Nordea	190
Länsförsäkringar	58
Skandia	52
Folksam	45
AMF Pension	37
Danske Fonder	25
Catella	18
Total 10 largest	1,234
Total	1,435

Source: Nyhetsbrevet Fond & Bank

**Table 10. Mutual fund wealth SEK billion**

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Equity funds	365	592	595	522	343	445	514	733	868
Fixed-income funds	104	116	123	162	205	244	275	310	340
Mixed funds	121	169	205	154	119	141	158	202	238
Hedge funds	-	-	-	28	36	43	50	71	82
Total	591	877	924	867	702	873	997	1,316	1,528

Source: Svensk Fondstatistik (part of MoneyMate)

<sup>63</sup> The figure for 2006 is provisional. Here, too, it should be pointed out that much of the pension foundations' asset management is conducted externally and therefore, just as in the case of the insurance associations, is included in the investment assets of the fund management companies.

Besides equity funds, other kinds of funds include fixed-income funds, which invest in interest-bearing securities, and "mixed funds", which invest in both equities and interest-bearing securities. There are also hedge funds, which differ from other funds in that their management is characterised by a relatively large amount of freedom regarding both investment strategies and the financial instruments that may be used, such as derivatives.

Fund management companies affiliated to insurance companies have substantially increased their share of the fund market in recent years, due to the growing interest in choosing funds for pension saving. This is partly the result of Sweden's pension reform in 2000, which saw the introduction of a premium pension system (PPM). In the premium pension system, the amounts set aside for premium pensions are invested in mutual funds. For private forms of pension savings, there are also a number of fund-based options (see the section on insurance companies). These forms of saving are basically the same product, the differences being the forms of ownership and taxation. Consequently, mutual funds today compete to some extent with the life assurance companies.

At the end of 2000, equity funds accounted for almost 65 per cent of the total investment fund assets. In 2001 and 2002, however, this proportion decreased due to the fall in prices in the stock market. In 2003, the stock market started to recover, which led to investment fund assets again increasing. Of total investment fund assets, equity funds accounted for 57 per cent at year-end 2006, fixed-income funds for 22 per cent and other funds for 21 per cent (see Table 10).

#### STATE-OWNED PENSION FUNDS

The Swedish public pension system is made up of two components, one collective and one individual. The collective element is a "pay as you go" system whereby pensions paid out are financed by current charges. The individual element consists of a premium reserve system in which pension disbursements are financed by money paid into funds during the individual's working lives and where individuals themselves chooses their fund management companies. Of the guaranteed pension entitlement, equivalent to 18.5 per cent of the individual's income, 16 per cent is managed under the "pay as you go" system and 2.5 per cent under the premium reserve system.

The task of the national pension funds is primarily to manage the pension capital within the framework of the “pay-as-you-go” system. This task is carried out in the first place by the First, Second, Third, Fourth and Sixth AP funds. The Seventh AP fund manages the capital in a premium reserve system in competition with private fund management companies. The Seventh AP fund also includes the pension capital of those people who did not exercise their right to choose a particular fund management company for their premium reserve pension.

The First, Second, Third and Fourth AP funds are bound by identical investment rules which state *inter alia* that pension capital may be invested in all capital market instruments that are tradable.<sup>64</sup> One restriction is that at least 30 per cent of the assets of the funds must be invested in low-risk debt securities. A limited proportion of the assets may be exposed to currency risk. The Sixth AP fund has the most flexible investment rules with regard to choice of instruments, but it may not invest abroad. The Seventh AP fund may also invest in instruments other than shares and debt securities and, like the first four AP funds, is also allowed to invest abroad.

At the end of 2006, the investment assets of the AP funds totalled SEK 929 billion. This can be compared to the life assurance companies and fund management companies, whose investment assets amounted to almost SEK 1,979 billion and SEK 1,528 billion respectively in December 2006.

## Securities institutions

Securities institutions is the term used to refer collectively to the securities companies and Swedish credit institutions that are licensed by the Swedish Financial Supervisory Authority to engage in securities trading. The term also covers foreign companies that engage in securities trading through a branch in Sweden. At present, the Authority can license five different kinds of an investment activity (see the fact box on central laws and forms of incorporation in the financial sector).

Securities institutions have two primary functions. One is to trade in securities in their own name on behalf of customers, i.e. commission trading, and the other is to buy and sell securities on their own behalf in their capacity as market makers. Being a market maker involves quoting two-way prices, i.e. bid and ask prices. All market makers must therefore be prepared at all times to buy and sell securities, which in turn makes for efficient pricing. By bringing together buyers

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<sup>64</sup> Up to 5 per cent of the assets may be invested in unlisted securities. However, these investments must be conducted indirectly via mutual funds or private equity investment companies.

and sellers of securities and acting as market makers, they contribute to liquidity, and thus a more efficient market in securities.

Another important role played by the securities companies is in underwriting and assisting in other ways in connection with the issue of securities. In this way, they play an important contribution in reducing the information gap between issuers and investors in different kinds of securities issues.

These companies are also able to provide credit to customers in conjunction with securities purchases and administrative services. They also accept deposits, to a limited extent, for these services.

At year-end 2006, approximately 200 Swedish companies had one or more of the above-mentioned licences to operate in securities trading. Just over half of these were securities companies, while the others were mainly banking companies and savings banks.

### SECURITIES COMPANIES

Of the 112 securities companies registered at year-end 2006, seven were full-range companies, i.e. they were licensed for all the above-mentioned securities trading. These companies are as a rule also members of ONBS. Examples of full-range securities companies are E. Öhman J:or and Erik Penser.

The securities companies not licensed for all activities often specialise in one or a small number of activities and therefore only need licences for those. This group includes, for example, a large number of small asset management companies, as well as companies with other specialisations. Of the group of securities companies that do not hold all licences, ten are members of ONBS.

The securities companies also include 14 power and commodity dealers. These offer their services primarily to professional customers.

Because many securities companies concentrate on arranging contacts between potential buyers and sellers, their balance sheets are often relatively modest. At year-end 2006, the total assets of the securities companies amounted to about SEK 23 billion.<sup>65</sup>

### SWEDISH CREDIT INSTITUTIONS THAT ENGAGE IN SECURITIES TRADING

In addition to securities companies, many banks engage in securities trading on a major scale. Of the total of 31 banking corporations registered in Sweden at year-end 2006, 27 were licensed for securities

<sup>65</sup> Based on the 33 largest securities companies, which account for most of the securities companies' total assets.

trading. Fourteen of these were members of ONBS and ten of them licensed for a full range of securities trading services.<sup>66</sup> These include the four major banks Swedbank, Handelsbanken, Nordea and SEB.

Another group of companies operate basically only in the investment business, but have, for different reasons, applied for and been granted a banking licence. To avoid restrictions and competitive disadvantages vis-à-vis the banks, a number of securities companies have applied for a banking licence. These include, for example, Carnegie Investment Bank, EFG Investment bank, Avanza Bankaktiebolag, HQ Bank, Kaupthing Bank Sweden and Nordnet Securities Bank. Furthermore, the Swedish securities companies may, subject to certain restrictions, accept deposits in order to facilitate their securities trading business.

Besides the securities companies and banking corporations referred to above, 67 savings banks had one or more securities trading licences at year-end 2006. Usually, this involved a licence to act as an agent in investment transactions, i.e. to accept the customer's order locally and submit it to an affiliated full-range bank. Among the savings banks, Sparbanken Finn alone is licensed for a full range of investment services and is moreover a member of ONBS.

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<sup>66</sup> See review of investment business licences, in-depth study "Central laws and forms of incorporation in the financial sector".



## Central laws and forms of incorporation in the financial sector

The regulations that apply to *banking and financing activities* in Sweden are laid down in the **Banking and Financing Business Act**. A licence is required from the Swedish Financial Supervisory Agency to operate a banking and finance business. A “banking business” is a business in two parts: it must be able both to mediate payments via general payment systems and to accept deposits that are available to the depositor within 30 days’ notice at most.

Banks may operate in limited liability form, as savings banks and as co-operative banks. The operations of all forms of banks are regulated by the Banking and Financing Business Act. The Act describes both what the banks are and are not allowed to do, as well as the way they are supervised. It also includes particular regulations on association for limited liability banks, while the establishment and organisation of savings banks and co-operative banks is regulated in separate acts.

A credit market company is a limited liability company or an economic association that is licensed to conduct financing activities. “Financing operations” is defined as business operations intended to accept funds from the general public and also to provide credit or credit guaran-

tees. The term also covers the acquisition of claims for financing purposes and the provision of leasing services.

Certain financial companies, for example those which do not accept funds from the public, do not need a licence and are therefore not subject to supervision by the Swedish Financial Supervisory Authority. However, these companies must be registered as financial institutions<sup>67</sup> and are subject to the legislation on money laundering and other crimes.

Under the **Deposits Business Act**, other limited companies and economic associations besides the credit institutions and securities companies can accept deposits from the public after registering with the Swedish Financial Supervisory Authority. These companies, known as *deposit companies*, may accept at most SEK 50,000 per consumer. Deposit companies are not subject to full supervision but are to be inspected by the Swedish Financial Supervisory Agency once a year.

One of the most important laws in the control of the banks and credit market companies is the **Capital Adequacy and Large Exposures for Credit Institutions and Securities Companies Act**. This Act stipulates how large the capital reserves a credit institution must have in relation to the risks that it assumes.

<sup>67</sup> In accordance with the Act on Compulsory Registration of Certain Financial Activities.

Examples of other laws that have a bearing on banks and credit market companies are the **Consumer Credit Act**, the main purpose of which is to regulate how credit services may be marketed, and the **Deposit Guarantee Act**, which is intended to guarantee the funds in depositors' accounts up to SEK 250,000. However, the deposit companies referred to above are not covered by the deposit guarantee.

Two fundamental statutory instruments regulate private insurance operations: **The Insurance Business Act**, which lays down the regulatory framework that governs insurance operations, and the **Insurance Contracts Act**, which regulates the relationship between insurance companies and policyholders.

The Insurance Business Act contains rules on the establishment of insurance companies in Sweden, their operations and on the supervision of Swedish insurance companies. The commercial rules distinguish between non-life assurance and life assurance business, operations that in principle must be conducted in separate companies. Policyholders are protected through a requirement to provide information, and a clear demarcation between shareholders' equity and policyholders' capital, as well as a contractual right to profits.

The Insurance Contracts Act regulates the legal relationship between the

insurer and the policyholder – as well as other beneficiaries. The Act applies to non-life casualty insurance, life assurance, accident insurance, consumer insurance and health insurance. **The Insurance Broking Act** applies to the actual distribution of insurance products. It regulates how these operations are licensed, stipulates a central register of brokers and lays down certain requirements they must comply with.

Securities trading is mainly regulated by the **Securities Trading Act**. Securities trading institutions is a collective term that refers to securities companies and Swedish credit institutions. The term covers banks and credit market companies licensed by the Swedish Financial Supervisory Authority to conduct securities trading, as well as foreign companies conducting securities trading from branches in Sweden. According to the Act, the Authority may grant licences for the following securities trading activities:

1. Trading in financial instruments on behalf of another party in its own name,
2. Acting as an intermediary in contacts between buyers and sellers of financial instruments, or other participation in transactions concerning such instruments,
3. Trading in financial instruments on its own behalf,

4. Management of another party's financial instruments,
5. The provision of guarantees or other participation in the issue of securities or offers to purchase or sell financial instruments directed to an open group.

Like the credit institutions, securities companies are also subject to the **Capital Adequacy and Large Exposures Act**.

Trading in securities also falls within the compass of, for example, the **Financial Instruments Trading Act** and the **Act on Penalties for Market Abuse in Trading in Financial Instruments**. The **Act on Financial Advice to Consumers** offers protection to consumers who seek what is called investment advice, i.e. advice concerning investment in financial instruments. The **Investor Protection Act** contains stipulations that provide some degree of financial protection to investors who have lost securities deposited, if the securities institution, fund management company or asset management company managing their assets should default. Matters concerning marketplaces for securities trading and clearing and settlement of securities transactions are mainly

regulated via the **Stock Exchange and Clearing Operations Act**.

In April 2004, the European Parliament and Council adopted the Directive on Markets in Financial Instruments (MiFID). This enjoins Member States to incorporate a number of joint regulations concerning securities companies and regulated markets. In Sweden, this affects the activities conducted by the stock exchanges and authorised marketplaces. According to the Directive, new legislation on the securities market will have to be passed and become effective in Sweden by 1 November 2007.

The operations of fund management companies are regulated in the **Mutual Funds Act**. The Act contains provisions on mutual funds on what are known as special funds. The latter differ from mutual funds, for instance, through their focus and the target group at which they are aimed. The assets of a mutual fund or a special fund, as well as incoming and outgoing payments relating to the fund, are administered by a *depository*, which must be a bank or other credit institution. The fund management company and the depository operate independently of each other.

## ■ The financial infrastructure

One of the financial system's most important functions is to create the right conditions for safe and efficient payments and securities transactions. The financial sector supplies an extensive infrastructure consisting of different systems, routines and instruments that facilitate the execution of payments.

This chapter first provides a general description of the instruments and the infrastructure needed to make payments and transactions in a modern economy. This is followed by a discussion of the use of different payment instruments in Sweden. The chapter concludes with a description of the most important components of the Swedish financial infrastructure.

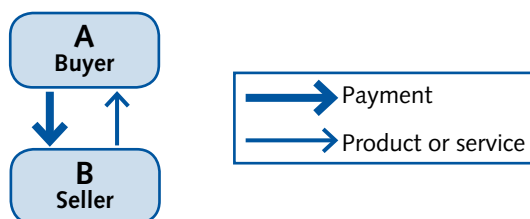
### Different types of payment – a general description

All market transactions consist in principle of two elements. The first part arises when the seller supplies the buyer with a product, a service or a financial instrument. The second part consists of the payment, i.e. a flow of money from the buyer to the seller. The two parts can occur simultaneously or at different points in time.

#### *A simple payment*

All payments essentially entail a transfer of money between two parties, a payment sender and a payment recipient. The way in which this transfer is made is determined by which *payment instrument* is used and through which *channel* the parties choose to make the payment. In a cash payment, the claim is extinguished and the payment completed at the actual time of payment, through the exchange of the payment instrument, that is to say, banknotes and coins. No intermediaries are required here. Figure 2 illustrates an example of a cash

Figure 2. Example of a cash transaction



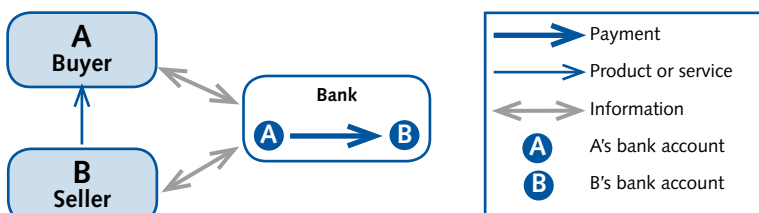
transaction. A and B may be individuals, companies or public authorities. A buys a product or a service from B and pays for it by giving B cash.

Examples of other payment instruments are giro transfer, credit transfer, cards, cheques and money orders. Unlike cash payments, payments using these instruments are not finalised at the time of payment. Instead they entail a transfer of money between two accounts at one or more banks, which then act as payment intermediaries. These instruments are therefore said to fall within the category of *account-based instruments*. Such instruments can often be used in different *channels*. A bank card, for instance, can be used for payments in a shop, via the Internet or by telephone. The payment channel thus states which route has been chosen for transmission of the information on the transaction.

#### *Payment using an intermediary*

The main difference between cash payments and account-based payments is that the latter require intermediaries. This means that more participants are required than those directly involved in the transaction.<sup>68</sup> It follows from this that in account-based payments, a time lag often arises between when the payment was initiated and when it is finalised. The payment sender initiates the payment by giving the bank an order to transfer the funds. The bank transfers the funds from the sender's account to the recipient's account and informs the recipient that his/her account has been credited. When the money has been transferred from the sender's account to the recipient's account, the payment has been *settled*, that is to say finalised. Figure 3 illustrates the transaction between A and B. The difference from the previous example is that A now pays via an account-based instrument. Both A and B have accounts at the same bank. The bank receives information on the transaction, debits A's account and credits B's account with the same amount.

Figure 3. Example of a payment using an intermediary



<sup>68</sup> However, cash also requires an infrastructure for storing and distributing the cash to post offices, banks and the general public.

The banks are central participants in the payment system because they provide the accounts through which households and companies make their payments. In addition, the banks supply their customers with the actual instruments of payment. A can pay B in cash, as in Figure 2, or by card, cheque or giro transfer, as in Figure 3. All of these are payment instruments to which A has access via a bank or, as is often the case with cash, via a bank-owned ATM or a cash dispenser in a shop. In other words, there is a market where the banks offer different payment services to companies and households.

*Payment using more than one intermediary*

The picture becomes more complicated if A and B have accounts with different banks. It is then necessary to have a more highly developed *financial infrastructure*, where information on the transaction and the actual payment can be transferred between the parties concerned. Such an infrastructure covers all of the systems, routines and rules required to manage an account-based payment from beginning to end. It also creates a market for sub-contractor services where various payment intermediaries act as buyers of infrastructure services. These payment intermediaries also provide parts of these services, as banks often jointly own many of the systems in the payment infrastructure. The financial infrastructure manages not only payments but also transactions in financial assets, for example securities (see the separate section further on).

The processes managed within the financial infrastructure can usually be summarised in three steps. Firstly, the payment must be *checked and authorised*. This is often performed at the actual point of payment and consists of a check of the parties' identities and the validity and genuineness of the payment instrument. It will also involve a check that sufficient funds are available to cover the transaction amount (funds sufficiency check).

After this, the transaction is *cleared*. This means that instructions are compiled on transferring the payment to the recipient's account. The process is performed by a *clearing organisation*. In Sweden it is Bankgirocentralen (BGC) (the bank giro centre) that clears most payments, such as giro transfers<sup>69</sup> and account-to-account transfers. In this example, clearing involves a compilation of the transactions between the two parties, A's and B's banks, and is therefore known as *bilateral clearing*. If several accounts and payment recipients are

<sup>69</sup> Plusgirot (formerly Postgirot) is not a clearing system but an internal system within Nordea. Although it is possible to pay into a postal giro account from another bank these payments are cleared by BGC or bilaterally between the banks.

involved, and if the compilation of transactions is conducted between all parties at the same time, this is called *multilateral clearing*.

In addition, clearing positions can be calculated either as gross amounts or net amounts. A's bank can, for example, pay B's bank SEK 100 while B's bank has to pay A's bank SEK 50. The clearing positions can then be calculated as gross amounts, i.e. total amounts. In this case, it means that A's bank pays SEK 100 and B's bank pays SEK 50.

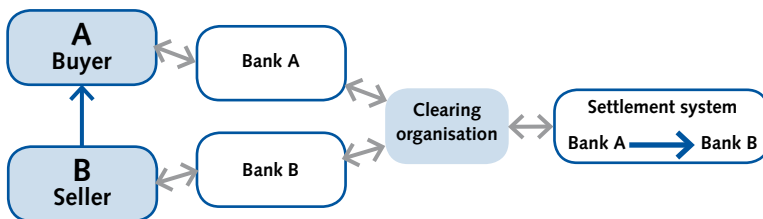
Alternatively, the clearing organisation can use bilateral netting. This takes place when two parties offset their debts and claims against one another. The effect is to reduce the size of the parties' exposures and liquidity requirements. In this case, the clearing positions are offset that A's bank pays SEK 50 to B's bank.

Multilateral netting involves all participants' debts and claims being offset against one another. Each participant then has a single claim on, or debt to, the other participants.<sup>70</sup> In some cases, the clearing can instead be performed through a central counterparty. This participant then becomes the counterparty in every transaction. The recipient then has a claim on the central counterparty and not on the payment sender, while the central counterparty has a claim on the sender. It is also possible for the central counterparty to use netting.

A payment using an account-based instrument from A to B, given that A and B have accounts with different banks, requires an infrastructure as illustrated in Figure 4.

The process after clearing is *settlement*<sup>71</sup>, when the amount is transferred from the sender's account to the recipient's account. If the payment sender and the payment recipient have accounts with different banks, settlement takes place via the accounts the banks themselves operate for this purpose in a *settlement system*. A settlement

Figure 4. Example of a payment where the payer and payee have different banks



<sup>70</sup> If we instead assume that there are three participants, where A will pay 100 to B and 120 to C, where B is to pay 50 to A and 20 to C and where C is to pay 150 to B, the net positions that arise are as follows: for A: -170, for B: +180 and for C: -10. The payment flows can then be simplified so that A pays 170 to B and C pays 10 to B.

<sup>71</sup> The three components of the process – checking/authorisation, clearing and settlement – also take place when the payment sender and the payment recipient have accounts in the same bank, but are then dealt with by the bank's internal systems instead. These transactions do not appear in the statistics on transactions between the banks.

system can thus be likened to a bank for the banks. The payment leads to the sender bank's account being debited and the recipient bank's account being credited with the amount transferred. The sending (receiving) bank in turn debits (credits) the respective customer's accounts. In Sweden, this settlement process takes place in the accounts that the banks and certain other financial companies, such as the clearing organisations, have with the Riksbank. The system that manages the settlement process is called RIX. This is used for settling payments that require funds to be transferred between different banks and clearing organisations (you can read more about RIX in the section on the payment infrastructure in Sweden).

Payments between banks and clearing organisations are different in character from those made by individual companies and households. The former are usually referred to as *large-value payments*, while the latter are termed *retail payments*.

The large-value payments are usually for substantial amounts, often between SEK 10 million and SEK 100 million. However, they are much fewer in number than retail payments. Because of their size, they also require more rapid settlement.

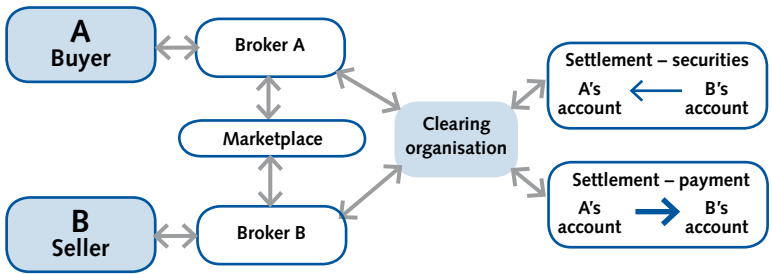
Retail payments are payments for relatively small amounts that are carried out in large numbers. They include both recurring payments, such as monthly bills, company invoices and salary payments, and also less urgent one-off payments, which are made by cash, cheques or card, for instance. Retail payments often have one or more banks as intermediaries. However, in some cases, company payments may cover sufficiently large amounts to be classified as large-value payments, even if the banks in these cases act as intermediaries.

#### *Transfers when trading financial instruments*

Financial instruments have many characteristics that create the need for an infrastructure in transactions in financial instruments similar to that for ordinary payments. In a transaction using financial instruments, such as equities or bonds, the process is similar to the example above. The difference is that trading in securities necessitates two flows. In addition to the transfer of the payment for the security from buyer to seller (the payment leg), there is also a transfer of the actual security from seller to buyer (the security leg). It is therefore also natural to integrate as far as possible the infrastructure required for transfers of financial instruments with the infrastructure for the payment leg of the transaction. A chart illustrating securities trading is provided in Figure 5.



Figure 5. Example of a transaction using financial instruments



A securities transaction comprises the following elements. When A and B have given their buy and sell orders respectively to the marketplace and these have been matched, a transaction is created. Given that trading in securities involves large amounts of money, the security aspect is especially important; any misunderstanding during such a deal could have serious consequences. For this reason, prior to clearing and settlement, a check is first made to ensure that the brokers on both sides have the same perceptions with regard to amounts, products and times.

The next step involves clearing, just as in the case of ordinary payments. The clearing organisation checks the parties' identities and whether the two transfers are possible. It also compiles instructions for the transfers. The deal is finally settled only when the transfers are made in both the payment leg and the security leg.

In Sweden, VPC AB clears and settles transactions from the equity market and the fixed-income market while ONBS clears derivative transactions. As in the case of other payments, payments are settled by the RIX system.

#### *Foreign exchange transactions*

The infrastructure for foreign exchange trading is essentially similar to the structure for trading in financial instruments. There are also two flows to be cleared and settled here. The difference is that two payments are exchanged for one another, one in each currency. Some of the foreign exchange trading is settled via an international settlement system, CLS, which is linked to the national settlement systems (you can read more about CLS in a later section).

This general description of payment instruments and the financial infrastructure is followed by a more detailed account of the different payment instruments in Sweden. The Swedish financial infrastructure is also discussed in more detail in a later section.

## Use of different payment instruments

The previous section provided an outline of the channels between participants in different types of payments. This section goes into greater detail as to how and to what extent the different payment instruments are used in Sweden. As pointed out in the general discussion, payments can be classified according to the type of payment instrument used. A rough classification can be made between *cash payments* and *account-based payments*. Another distinction may be made between *retail payments* and *large-value payments*. Today, large-value payments are now made only through transfers between accounts. Retail payments, on the other hand, can be made using different instruments of payment, both account-based and cash.

### CASH PAYMENTS

From the point of view of risk, cash payments have the advantage that they do not entail any time lag between the conclusion of the deal and the settlement of the payment. The seller supplies the product or service at the same time as the buyer hands over cash, and both sides of the transaction are thus finalised. In addition, banknotes and coins, because they are issued by the Riksbank, are claims against the central government that can always be redeemed by the banks. Holders of banknotes therefore run no credit risk. On the other hand, other types of risk arise with cash, such as counterfeiting or loss through theft or robbery.

Cash is also expensive to handle. Use of cash as a means of payment involves a large number of participants. These include the *Riksbank*, which issues banknotes and coins, and *the banks* which buy banknotes and coins from the Riksbank and provide ATMs. Other participants are the *companies* that distribute cash, fill the ATMs and count daily takings from shops. The *shops* themselves are also participants because they handle cash. Organising the distribution and storage of cash in a secure manner is expensive; one reason is the considerable risk of theft.

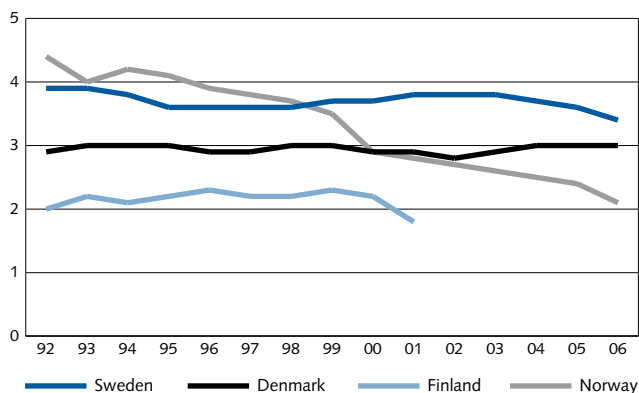
Cash is primarily used in transactions involving small amounts, where the seller and buyer meet directly. Nevertheless, cash payments account for a large proportion of the number of transactions. However, this proportion has fallen in recent years, in favour of the use of cards. As there are no overall statistics on cash usage, this can only be estimated. Measuring the value of currency in circulation ("M0" in economic terminology) relative to gross domestic product (GDP) can give an indication of the use of cash (see Chart 24). Over time, this measure has declined in Sweden. The value of banknotes and coins

as a percentage of GDP has more than halved since 1950, from 10 to 3.7 per cent. This reflects the emergence of alternative payment instruments, particularly cards. Given the rapid rise in the use of cards, especially in the late 1990s, it might have been expected that the use of cash would continue to fall. This, however, has not been the case; the trend of falling demand for cash has halted in recent years. In December 2006, the public's holdings of banknotes and coins totalled SEK 112 billion in Sweden.

Much suggests that the use of cash in Sweden has declined in recent years. For example, withdrawals from ATMs have fallen. On the other hand, cash withdrawals via payment card terminals in shops ("cash-back" withdrawals) have increased.

A study carried out by the Riksbank<sup>72</sup> shows that the percentage of cash payments in registered trade has fallen, from just over 75 per cent in the early 1990s to just under 60 per cent in the late 1990s. The study showed that up to 50 per cent of the demand for cash cannot be explained. Part of the explanation lies in the nature of cash – it is often the most appropriate instrument when making payments between people who meet face to face. The fact that transactions between individuals selling and buying second-hand goods are for obvious reasons not registered makes it difficult to estimate their real extent. Cash is also used as a means of payment in the black market and in illegal activities.

**Chart 24. Bank notes and coins in circulation in relation to GDP in the Nordic countries**  
Per cent



Sources: The Riksbank, Danmarks Nationalbank, Norges Bank and Bank of Finland  
Note. No figures are given for Finland after 2001 as the Eurosystem's reporting of the Euro banknotes affects the amount of the banknotes in circulation since January 2002. This has meant that Finland's banknote figure is not comparable with previous years.

<sup>72</sup> See Andersson and Guibourg (2001), "The use of cash in the Swedish economy" (Money and Foreign Exchange Policy) 2001/4. An estimate was made of the use of cash at points-of-sale. The value of the cash payments that take place during a year is calculated as the difference between the total turnover in the registered trade during the year and the total value of the transactions that have taken place using cards and cheques.

## ACCOUNT-BASED PAYMENTS

The expression “account-based payments” is a collective term for different types of account transfers. These include giro transfers, direct debit, cheques, debit cards, charge cards and credit cards. Cards and cheques are used more for one-off payments that are made at the actual time of transaction. Giro transfers are used more for long-distance payments, including monthly bills and one-off payments such as final settlement of credit card payments. (See the fact box for explanations.)

In account-based payments, a time lag arises between the conclusion of the deal and the settlement of the payment. This happens whether the payment is made before or after or during the transaction. In addition, these payments create a need for intermediaries. As a result, *settlement risks* arise, that is to say, the risk that one of the parties involved in the transaction will be unable to meet its obligations. Such risks may arise because of financial problems on the part of intermediaries involved. They may also arise because of technical problems or security shortcomings in the systems processing the payments.

Account-based payments tend to be more cost-efficient than cash payments. However, this is not always the case. The costs vary substantially, depending on the specific instrument and the efficiency of the channels used. It is generally the case that payments over the counter, cheques, cash withdrawals and paper-based giro payments<sup>73</sup> are expensive to produce. Electronically-initiated payments, such as direct debit, transfer from an Internet bank and bank card transactions are relatively less expensive.<sup>74</sup>

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<sup>73</sup> Paper-based payments are payments for which banks receive payment information from the payments sender on some type of form, regardless of whether the transaction is machine-read and processed electronically, for example a paper-based giro transfer form. Electronic transactions are payments initiated with the aid of electronic media – file transfer, the Internet etc.

<sup>74</sup> See Guibourg G., Segendorf B. (2004) “Do Prices Reflect Costs? A study of the price and cost structure of retail payment services in the Swedish banking sector 2002”, Sveriges Riksbank Working Paper Series no. 172, October 2004.

## Account-based payment instruments

A transfer involves a payment by transferring a credit balance from one account holder to another. A **giro payment** is a special form of transfer. The only difference from other forms of payment is a practical one. Giro payments use a special number to identify the payments sender and the payment recipient<sup>75</sup>. Other transfers use the normal bank account number. In English no difference is normally made between giro payments and transfers; both are referred to as credit transfers. **Direct debit** is an agreement giving the payment recipient the right to withdraw a specific amount from the payment sender's account. A **debit card** enables the amount for the transaction to be deducted directly from the cardholder's bank account. A **charge card** gives the cardholder credit facilities up to a certain limit. The entire debt is paid off after a specified period. A **credit card** provides the cardholder with credit facilities up to a certain limit. Either

the entire debt is paid in full, or part of it is repaid, after a specified period. In the latter case, the outstanding debt is rolled over into a new period. Interest is charged on the outstanding amount. A **cheque** is a written instruction from the writer of the cheque to the redeeming bank to pay a certain amount. The payment is made either to the person writing the cheque or a third party indicated by that person. In addition to those already mentioned, there are a few more types of account-based payments, although these have limited use. One such example is the **bank money order** which is a special type of cheque. It is made out by the bank to the customer wanting to execute a payment. After the customer has paid the bank, he or she is given a promissory note for the amount paid. The customer can then transfer this promissory note to the payment recipient, who can redeem it at the bank.

<sup>75</sup> Several bank giro numbers may be associated with one account number.

As mentioned earlier, payments are often classified as either large-value payments or retail payments. Although retail payments are often made using cash, the statistics on retail payments only cover the account-based instruments. A breakdown into large-value payments and account-based retail payments by number of transactions and value is contained in Tables 11 and 12.

Countries are often divided into giro/credit transfer-based or cheque-based, depending on how account-based payment instruments are used. Sweden, like the other Nordic countries, has a largely giro-based payment system. Charts 25 and 26 show how the use of account-based payment instruments in Sweden has changed in recent years in terms of both number and value of transactions. In terms of value, giro transfers have long been growing in importance, and in 2006 accounted for 91 per cent of the total value mediated. However, their percentage of total transactions has declined during this period. In 2006, giro transfers accounted for 29 per cent of the number of transactions. In 2002, the corresponding figure was 40 per cent. The decline in the proportion of giro transfers corresponds to an increase in the percentage of card payments. Over the period 2002 to 2006, their percentage of the number of transactions rose by 4 per cent.<sup>76</sup> Cards

**Table 11. Transaction value, breakdown into large-value and account-based retail payments**  
SEK billion

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Retail payments	7,079	7,681	10,141	9,105	9,465	9,135	6,896	7,032	7,853	8,763	9,762
Large-value payments	78,189	82,051	91,701	100,924	107,210	113,374	114,011	112,358	108,998	111,171	124,751

Note. The statistics include payments between accounts at different banks. However, they do not include cash payments nor, in most cases, transfers between accounts at the same bank. The reported reductions in volume and value of mass payments in 2002 are due to the acquisition of Postgirot by Nordea so that it became an internal bank system. The credit transfers between postal giro accounts are no longer included in the reported statistics. Most retail payments pass through BGC's netting system. The netted amounts from this system are also included in the category of large-value payments. The large-value payments are defined here as those settled in RIX.

Source: The Riksbank

**Table 12. Number of transactions, breakdown between large payments and account-base retail payments**  
Billion transactions

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Retail payments	863	912	1,014	1,140	1,207	1,264	1,078	1,308	1,561	1,743	1,959
Large-value payments	0.3	0.3	0.3	0.3	0.5	0.7	1.1	1.3	1.3	1.2	1.7

Note. The statistics include payments between accounts at different banks. However, they do not include cash payments nor, in most cases, transfers between accounts at the same bank. The reported reductions in volume and value of mass payments in 2002 are due to the acquisition of Postgirot by Nordea so that it became an internal bank system. The credit transfers between postal giro accounts are no longer included in the reported statistics. Most retail payments pass through BGC's netting system. The netted amounts from this system are also included in the category of large-value payments. The large-value payments are defined here as those settled in RIX.

Source: The Riksbank

<sup>76</sup> The Riksbank only gathers card information for the cards accepted as general instruments of payment. These are often issued by banks in collaboration with the large international card companies such as Visa and MasterCard. It also includes cards issued by American Express and Diners Club. It does not include cards issued by petrol companies etc.

now account for 61 per cent of the number of transactions. The use of cheques has gradually declined and at year-end 2006 was virtually non-existent.

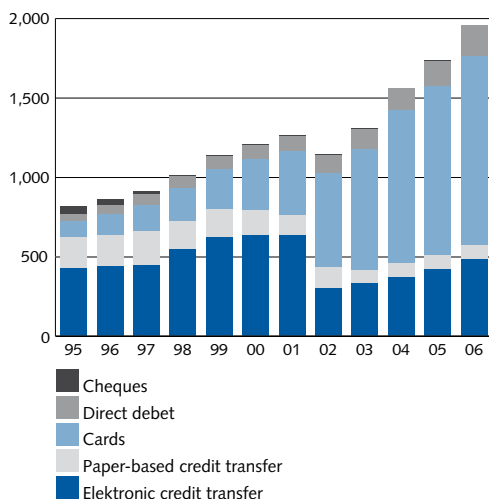
Although the Swedish card market overall has grown impressively in recent years, the use of cards still lags behind that in the other Nordic countries (see Chart 27).

### Internet payments

Use of the Internet is widespread in Sweden. Today, around 80 per cent of the Swedish households have access to the Internet.<sup>77</sup> This trend has resulted in increased use of the Internet as a channel for payments. As may be seen in Chart 28, the number of Internet bank customers in Sweden has risen sharply in the past six years.<sup>78</sup>

Today's payment solutions for the Internet generally require traditional payment instruments to be adapted to the new payment channel. A good example of this is giro transfers over the Internet. In some banks, more than 50 per cent of giro transfers are Internet-based, and this percentage is increasing rapidly. Electronic invoicing services, which are information services, are now linked to the Internet giro

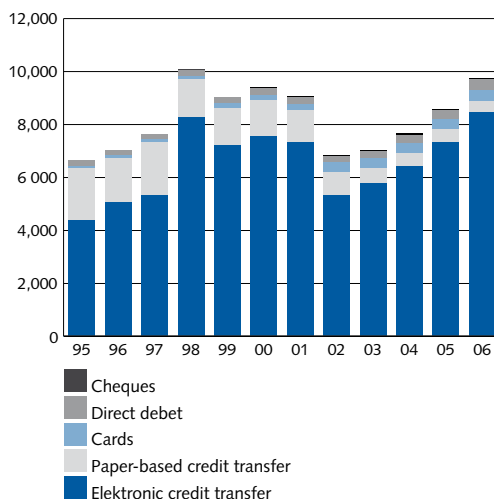
**Chart 25. Use of account-based retail payment instruments**  
Million transactions



Source: The Riksbank

Note: The reduction in the number of credit transfers from 2002 is explained to the credit transfers between two postal giro accounts no longer being included in the statistics since these are now internal transactions in Nordea.

**Chart 26. Use of account-based retail payment systems**  
SEK billion



Source: The Riksbank

Note: The reduction in the number of credit transfers from 2002 is explained to the credit transfers between two postal giro accounts no longer being included in the statistics since these are now internal transactions in Nordea.

<sup>77</sup> Eurostat.

<sup>78</sup> In interpreting the statistics on the number of Internet bank customers, it should be observed that one person may be a customer of several Internet banks.

transfer service. The payment recipient sends the billing information direct to the Internet bank of the invoice recipient, where the recipient can see the entire invoice and pay it as an ordinary Internet giro transfer, without having to key in all the information about the payment itself. Most banks offer some form of "secure" payment solution for Internet shopping.

One common method for paying for goods or services on the Internet is to use bank or credit cards. In addition, a number of different techniques are available for making Internet payments secure. One such technique is "e-cards", which are fictional bank cards that may only be used on one payment occasion.

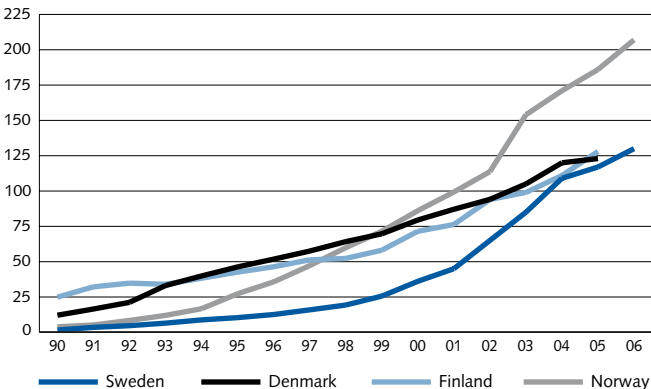
## The payment infrastructure in Sweden

The first section of this chapter contained a general description of payment instruments and the payment infrastructure. This general description was followed by a more in-depth review of how the payment instruments are used in Sweden and neighbouring countries. What follows below is a more detailed description of the infrastructure for payments and trade in financial instruments.

### *RIX system*

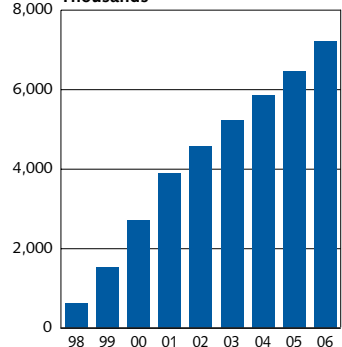
As mentioned in the first section of this chapter, the basis of the payment system is the banks' deposit accounts. Customers can use these accounts to make the payments they need to make. The banks can in turn make payments via their accounts in the Riksbank's RIX system, which in this way constitutes a central hub in the infrastructure. The banks' accounts with the Riksbank are used for both the direct pay-

Chart 27. Number of card transactions per capita in the Nordic countries



Sources: ECB and Norges Bank.

Chart 28. Number of Internet bank customers  
Thousands



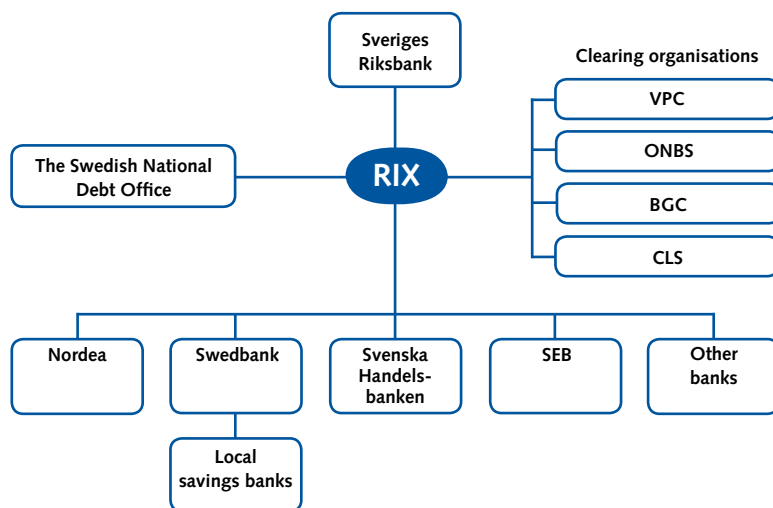
Source: The Swedish Bankers' Association



ments between the banks and for the final settlement of payment orders from bank customers. This means that all payments involving a transfer from an account in one bank to an account in another are settled through the banks' accounts in the RIX system. This also applies to account-based retail payments in aggregate form. Payments arising from transactions in financial instruments are also settled via the RIX system. In addition to the Riksbank, which owns and operates the system, all of the major banks and clearing organisations participate in RIX (see Figure 6).<sup>79</sup> Participants in a RIX system can also make payments on behalf of other, mainly smaller, banks.

Settlement in the RIX system is based on the principle of real-time gross settlement (RTGS), which means that payments are settled immediately and individually, provided that the payer has sufficient liquid funds. This method of settlement entails lowest settlement risk, but on the other hand requires substantial liquidity.<sup>80</sup> If liquidity at the payer bank is insufficient, the payment is queued until sufficient liquidity becomes available. In order to ensure the smooth settlement of payments, the banks are able to cover their liquidity requirements by borrowing intra-day funds from the Riksbank. All such borrowing is fully secured.

Figure 6. The Swedish payment system



<sup>79</sup> The participants in the RIX system are the 14 Swedish credit institutions, BGC, VPC, ONBS, CLS, the Swedish National Debt Office and the Riksbank.

<sup>80</sup> Multilateral net settlement involves offsetting all the participants' debts against one another. This method requires less liquidity, but at the cost of increased risk, as the entire settlement process is halted if one participant – regardless of size – cannot meet its obligations.

In 2006, the number of transactions in RIX averaged around 6,800 per banking day, while the daily turnover averaged approximately SEK 490 billion. This may be compared with the bank giro system, which was designed to handle a high volume of payments, but for considerably lesser amounts. In 2006, the bank giro system mediated on average around SEK 24 billion, represented by 2.3 million payment assignments, per banking day.

Some payments are first netted at one of the clearing organisations. Then, only the resulting net amount is settled in RIX. The vast majority of all payments, however, are sent directly from the participants for settlement in RIX.

#### *Bankgirocentralen – BGC*

In Sweden, BGC (Bankgirocentralen BGC AB) is the main intermediary for retail payments between the banks. BGC is owned jointly by the major banks in Sweden. BGC operates and develops the bank giro system, which is a clearing system for SEK payments and in some cases euro payments between bank accounts in Sweden. BGC also carries out certain clearing services outside the bank giro system.

#### *Bankgirot*

The bank giro system is an open system, which means that the same terms apply to all participating banks. The banks that meet the criteria for participation and the technical prerequisites for affiliation can participate in and access the payment services provided in the BGC system.

Currently 19 banks are members of the bank giro system. The banks distribute, in turn, BGC's range of payment products to their own corporate and private clients. The openness of the system means that a bank customer can make a payment to another customer via BGC even if the latter has a different bank. Companies can also establish direct customer contacts via BGC. BGC offers services to these customers where information on cleared and settled transactions is integrated into the customers' internal auditing systems via electronic file transfer.

The transfers between the banks are made via a bank giro number. A bank giro number is an address that refers to a specific bank account. BGC compiles and mediates information to the banks regarding the size of the transfers to be made and the accounts to be credited. The transactions are cleared in the BGC system as bilateral net transactions. This means that only one payment obligation arises for each pair of participants. The actual settlement of the net positions

is made via the participants' accounts in RIX. This procedure is carried out for a number of different types of payment products designed to meet different needs, for example giro payments, payments to suppliers by companies, salary payments into accounts and tax payments. Each of the payment services has one or more predetermined settlement times each day. In 2006, 559 million payment transactions were mediated by the bank giro system to a total value of SEK 5,724 billion.

Transactions via the bank giro system can be initiated in many different ways, for example over the counter at a bank branch, by payment instruction or over the Internet. Companies and public authorities can also deliver files with payment information directly to BGC. The bank giro system also manages debit transactions, i.e. transactions initiated by the payment recipient rather than the payment sender. This is the case, for instance, with direct debits.

The way transactions are managed in the bank giro system differs according to the type of transaction. In certain transactions, the bank giro system manages both authorisation and checking, as well as clearing and settlement. Other transactions, known as pre-debited transactions, will have been authorised at the time of the transaction by another system. Bankgirot then receives information from these systems and is only responsible for clearing and settlement, as well as crediting the customer's account after settlement. Examples of pre-debited transactions are paper-based giro transactions and giro transactions via an Internet bank. In the latter case, authorisation will have taken place in the bank's internal system, and in the former at **Privatgirot**, which manages paper-based giro transactions mainly initiated by households. The payment information in these "payment instructions" is machine-read, checked and then converted into computer files before being sent on to BGC and Plusgirot.

BGC also manages certain transactions that do not derive from payment products offered within the bank giro system. Examples of such payments include cheque payments, account-to-account transfers, Internet payments not using a bank giro number, card payments and cash withdrawals via ATMs. What all of these payments have in common is that they have been initiated in systems other than the bank giro system. Dataclearing is mainly used for standard bank transfers from account to account, not using a bank giro number and for cheque payments. Dataclearing is operated by BGC on behalf of the *Swedish Bankers Association* (Svenska Bankföreningen). CEKAB<sup>81</sup> deals with authorisation and clearing of cash withdrawals from ATMs

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<sup>81</sup> CEKAB was established in 1989 as part of the collaboration for operation and management of ATMs within the Bankomat system. CEKAB now has two major business areas - ATM and POS.

as well as authorisation of card payments. Clearing of card payments takes place, however, via Visa's and MasterCard Europe's international networks. The totals for clearing from cash withdrawals and MasterCard Europe's card payments in Sweden are calculated and forwarded via BGC for settlement in RIX.

BGC also sends settlement and credit information to RIX for the distribution of cash to and from banks and post offices on behalf of the banks.

Bankgirot's payment services also enable giro transactions to Plusgiro numbers in certain cases. It is also possible via Bankgirot's payment services to make deposits in personal accounts at Nordea. Plusgirot, formerly Postgirot, was acquired by Nordea in December 2002 and is now an internal system for transfers between accounts in Nordea.

#### TRANSACTIONS WITH FINANCIAL INSTRUMENTS

Trade in financial instruments covers transactions with securities, such as shares and bonds, and derivatives, such as options and futures. The actual trade in financial instruments is described in more detail in the chapter entitled *The financial markets*.

As with other transactions, trade in financial instruments needs an infrastructure that manages the exchange of payments and information between the parties, i.e. clearing and settlement of transactions. As mentioned earlier, financial transactions require two-stage settlement, one for the security and one for the payment. In addition, systems are required to register the financial instruments and keep account of them.

In Sweden, VPC AB clears and settles transactions from the equity market and the fixed-income market. ONBS clears derivative transactions. Both these institutions participate in the Riksbank's RIX system where the payment is settled.

#### *Transactions with equities and debt securities*

In Sweden, today, securities hardly exist in physical form. Instead, securities exist almost exclusively as electronic registrations. As a result, the institution that keeps the accounts in which the various participants' holdings are registered, the central securities depository, is a very important participant in the financial infrastructure. In Sweden, VPC acts as the central securities depository. VPC registers all transactions arising from issues of, trade in and pledging of securities. VPC is also the institution that clears and settles transactions in both equities and debt securities.

Transactions involving equities or debt securities begin with the investor giving his or her broker an order to buy or sell. Brokers normally trade by acting as counterparties themselves or by seeking a counterparty in a marketplace. When the transaction is completed, the brokers inform VPC. As part of the clearing process, VPC checks the identity of the brokers, that they have agreed on the securities, the number, the amount, the date of settlement etc. VPC also checks that the seller can deliver the security and that the buyer can pay for it. After this, the information required to make the actual transfers is compiled. Only then can the transfers be made, i.e. the transaction is settled.

Transactions with financial instruments often involve large amounts. This makes it important for settlement of both stages of the transaction to take place at the same time. This is known as delivery versus payment (DvP). In delivery versus payment, it is important to ensure that neither seller nor buyer has control over both the money and the security at the same time. To further reduce the risk, it is important to enable settlement of the payment to be made in "central bank money", at least when the transfer is being made between the main participants in the market. This means that the liquid funds in the settlement accounts used to settle the payment leg of the transactions consists of claims on the central bank and not the commercial bank, which could default.<sup>82</sup> Settlement therefore takes place in the settlement accounts provided by the central bank.

Since November 2003, each transaction is cleared and settled separately in VPC. The transactions are checked one by one. Settlement takes place by earmarking the seller's securities and the buyer's money in the account and by marking the transaction as ready. The VPC system therefore does not include any netting. At this stage, the transfers are irrevocable.

To ensure that the settlement of the securities leg and the payment leg occurs simultaneously and that settlement can be made in central bank money, the Riksbank allows VPC to administer the accounts in the Riksbank's RIX system. This means that participants can be sure that no unnecessary risks will arise during settlement. To cover the need for liquidity that a clearing member may have in the settlement of a security transaction, the member can move funds between the Riksbank accounts administered by VPC and their normal RIX accounts at a number of times during the day. The Riksbank can also grant credit on these accounts during the day.

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<sup>82</sup> While Sweden, like many other countries, has a government deposit guarantee, this only applies to an amount up to SEK 250,000, which does not cover the risks of professional participants.

In Sweden, the entire process normally takes three days, from when a transaction is matched in the market place to the final settlement. This applies to both the equity and the fixed-income markets. In the case of debt securities with maturities of less than one year, the entire process takes just two days.

In February 2007, the gross figure for settlements of equities averaged around SEK 42 billion per day. The corresponding figure for settlements of fixed-income instruments amounted to SEK 452 billion. Turnover in the money market is thus much higher than in the equity market. However, the number of transactions in the equity market is a great deal higher. In the equity market, an average of 99,673 transactions were settled per day while the average in the fixed-income market was 1,725.

Since December 2004, VPC AB has owned the corresponding institution in Finland, APK OY. At that point, VPC acquired 100 per cent of the shares outstanding in the company, and as a result a normal corporate group relationship was established, with VPC as the parent company and APK as a wholly owned subsidiary. Operations are conducted under the brand NCSD Group.

VPC is owned by the four major Swedish banks, each of which owns just under a quarter of the company. The remainder, just over one per cent, is owned by other Swedish market participants. VPC has more than 1,100 affiliated issuers and registers holdings in the accounts of approximately 3.9 million investors. There are very few countries where the central securities depository holds accounts for end-investors. In almost all other countries, end investors must open a custodial account with a broker. In these countries, it is only the brokers who have accounts with the central securities depository.

#### *Transactions with derivative instruments*

There are a couple of major differences between transactions with derivative instruments and transactions with equities and debt securities. Firstly, a transaction with a derivative instrument, unlike an equity or a bond deal, does not require a transfer of the right of ownership to the underlying instrument.<sup>83</sup> Instead, a derivative transaction requires the parties to enter into a contract whose value is determined by changes in the value of the underlying instrument. Secondly, a derivative transaction means that the investor has an open position for a longer period of time than in equity or bond deals, and that the value of the claim on the counterparty may change during this period. As a result,

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<sup>83</sup> The underlying instrument can be a security, a currency or a commodity.

the risk arises that the counterparty will not be able to pay as planned. This risk normally lasts until the derivative contract matures, which may be several months after the contract was signed. It is also only when maturity is reached that the position is settled.

It is to manage precisely the counterparty risk that ONBS acts as central counterparty *inter alia* in trading in standardised derivative contracts and some of the government securities traded via the electronic platform (see also the chapter *The financial markets*).

When ONBS assumes the role of central counterparty in the deal between buyer and seller, this means that each transaction is replaced by two new deals, where the central counterparty is seller to all buyers and buyer to all sellers. As a result, the original parties either have a claim or debt in respect of the central counterparty instead of each other. Clearing is conducted on a multilateral basis and the settlement risks to which parties would have been exposed vis-à-vis each other are shifted to the central counterparty. The netting offered by the central counterparty reduces the total risk exposure. In addition, the participants know that they can always rely on ONBS as counterparty and manage their risks accordingly. This arrangement is especially valuable when trading takes place anonymously as is the case in ONBS's derivatives trading. At the same time, the arrangement entails a concentration of risk on to the central counterparty, which must therefore be both financially strong and have routines in place for managing risk. The central counterparty must be able to deliver securities or cash without delay, even if a member suffers delivery problems.

When derivative contracts are signed, payment flows mostly arise, in the form of option premiums for example. Payments may also arise during the term of derivative contracts, in the form of marginal collateral requirements.<sup>84</sup> These payments are cleared on ONBS and settled in RIX.

When the derivative contract matures, settlement is either via a cash payment or delivery of the agreed volume of the underlying instrument. In the case of cash settlement, the amount is cleared by ONBS and settled directly in RIX. When delivering the underlying security, the securities leg of the deal is settled by transferring the financial asset in VPC's system, while settlement of the payment leg takes place in the RIX accounts administered by VPC.

In recent years, OMX has established an integrated Nordic derivatives market. Through this market, ONBS offers trading in and clearing of options and forwards in Swedish, Danish, Finnish and Norwegian

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<sup>84</sup> Marginal collateral is provided at issue of options or at purchase and sale of futures. This collateral covers only a certain proportion of the underlying value.

equity-based derivatives. In addition, a clearing service is offered for interbank-traded fixed-income derivatives, trading in and clearing of Finnish share loans and clearing of tailor-made contracts (TMC) in equities, tradable indexes, client-specific indexes and fixed-income products. In 2006, an average of approximately 550,000 Swedish, Finnish, Danish and Norwegian derivative contracts were traded daily.

#### *Foreign exchange transactions*

Settlement of international foreign exchange transactions may give rise to substantial risks. This is because the two legs in a foreign exchange transaction are settled separately in the home country of each currency. As a result, a time delay arises, leading to major exposures between the banks. In order to reduce the risks arising from foreign exchange transactions, Continuous Linked Settlement (CLS) was established in September 2002. In CLS, foreign exchange transactions are settled on a "payment versus payment" basis. In the system, both legs of the foreign exchange transactions are settled simultaneously. This eliminates the settlement risks.

The system is operated by CLS Bank and is subject to the supervision of the Federal Reserve Bank of New York. In February 2007, turnover amounted to an average of USD 3,007 billion per day, which is five times larger than Sweden's annual gross domestic product, GDP.

Three Swedish banks are direct participants in CLS. The currencies included in the system at present are the US, Australian, New Zealand, Canadian, Hong Kong and Singapore dollars, the euro, the Korean won, the British pound, the Swiss franc, the Japanese yen, Swedish, Norwegian and Danish kronor, and the South African rand.

However, not all cross-border payments are made via CLS. Only the payments that give rise to foreign exchange transactions are transacted via CLS. Substantial numbers of other international payments are still handled directly between the Swedish banks. Some cross-border payments arise from ordinary payments in a currency other than the domestic one, which requires mediation by banks in other countries. If, for example, a US bank wants to make payments in SEK on its own behalf or on behalf of a customer, the bank opens an account with a Swedish bank, which is known as a correspondent bank. The US bank sends a payment instruction to the Swedish correspondent bank with details of the amount and final recipient. The Swedish bank in turn withdraws the stated amount in SEK from the US bank's account. If the recipient of the payment has an account in the same bank as the US bank, the amount is credited directly to this account, and in this way the payment is settled. If the recipient is an-



other Swedish bank, or is a person who has an account with another bank, the payment must first be channelled through the Swedish payment system. A payment is then generated in RIX. The settlement risk increases if CLS is not used in foreign exchange payments, because the payments are not settled "payment versus payment". If the banks dealing with each other are in different time zones, a risk arises in the settlement phase. The risk is that a party to a foreign exchange deal will pay in the currency sold, but the second party will not receive the currency bought. This represents full credit risk and is known as Herstatt risk.

## Payment flows in the Swedish financial infrastructure

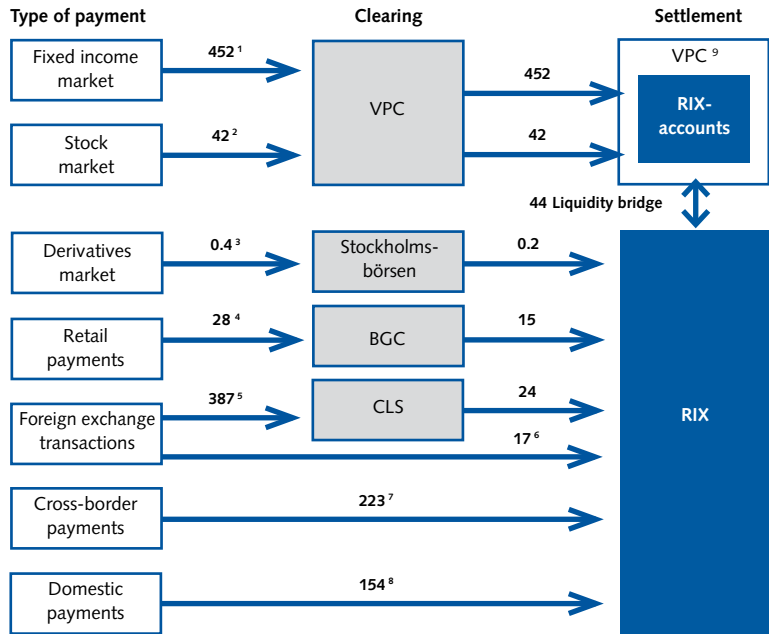
Now that we have described the most important systems in the Swedish infrastructure for payments and securities transactions, it is now time to link them together.

As mentioned at the beginning of the section, RIX is the central hub of the financial infrastructure in Sweden. Via the RIX system, approximately SEK 433 billion flowed in on average per day in February 2007. (The approximately SEK 494 billion that was on average held via RIX in VPC accounts per day during February 2007 is not included in this figure.) In other words, an amount corresponding to the annual GDP of Sweden passes through RIX in a week. The banks account for the largest flows in the RIX system. It is through the banks that households, companies and public authorities manage the major share of their payments. In addition, the banks are the major owners in both VPC and BGC.

Figure 7 illustrates how the payment flows from different sources of payment reach RIX, either directly or via clearing at VPC, ONBS, BGC or CLS. The Figure shows the payment flows per day in 2007. It is not intended to reflect the turnover in the respective markets, only payment transactions.

As Figure 7 shows, trade in the fixed-income market gives rise to the largest payment flows in the infrastructure. During this period, VPC cleared transactions averaging SEK 452 billion per day from the fixed-income market and on average SEK 42 billion per day from the equity market. These amounts were settled in the RIX accounts administered by VPC. The participants in RIX are able to transfer, during the day, some of their liquidity in the system between the ordinary accounts and the accounts administered by VPC. Via this liquidity bridge, an average of SEK 44 billion per day was transferred during February 2007.

**Figure 7. Payment flows in the Swedish financial infrastructure  
SEK billion per day, February 2007**



<sup>1</sup> Covers all spot trading and the derivatives trading that leads to transfer of the ownership of the underlying asset. The population studied is comprised of VPC's 20 or so clearing members with regard to trade in fixed income instruments.

<sup>2</sup> Refers to delivery of underlying securities, although not to internal transactions (i.e. when a clearing member has itself as counterparty on the stock exchange). The figure includes both trade on the stock market and outside of it. The population studied is comprised of VPC's 40 or so clearing members with regard to trade in equity.

<sup>3</sup> Refers to payments for derivative transactions settled on the stock market, for example, equity options, equity futures, index options and index futures. The statistics thus cover only the derivative transactions that actually generate a payment, which comprise a minor part of the turnover as derivative positions are to a great extent netted between participants. The studied population comprises the Stockholm stock exchange's 44 members in the derivatives market.

<sup>4</sup> Refers to account-based payments to and from private persons and companies.

<sup>5</sup> Refers to payments in SEK for foreign exchange transactions, usually based on foreign exchange contracts (spot, forward, FX-swaps and options). These are largely made through the CLS. The foreign payments that arise directly from foreign exchange transactions are largely made through the CLS. The studied population consists of CLS's 57 member banks who come from fifteen different currency areas.

<sup>6</sup> Refers to interbank payments regarding foreign exchange transactions, e.g. a transfer between a Swedish bank and a foreign bank's account with another bank.

<sup>7</sup> Refers to payments in SEK made to a Swedish bank, which in turn acts as a correspondent bank for a foreign bank, also known as foreign clearing.

<sup>8</sup> Refers to payments in SEK between Swedish banks in Sweden.

<sup>9</sup> VPC administers the VPC accounts in RIX for settlement from the fixed income market and the stock market.

Note. The statistics in the figure show the flows in RIX. The figure is not intended to reflect the turnover in the respective markets; it is limited to payment flows. The corresponding flows over a number of years are described in Table Z in the Tables annex. Transactions to and from the clearing organisations employing netting, i.e. the CLS, BGC and Stockholm stock exchange, are dealt with slightly differently in the statistics compared with other payments. A normal gross payment is made as a direct transfer between the two parties. The amount then enters the statistics only once. A payment made via a netting clearing organisation will enter the statistics as two payments; one from the sending bank to the clearing organisation, and one from the clearing organisation to the receiving bank. To study the netting effect, i.e. the difference between gross and net flows, the stated amounts from the CLS, BGC and Stockholm stock exchange in principle need to be halved.

Sources: The Riksbank, BGC, VPC, the CLS and the Stockholm stock exchange.

Derivatives trading on ONBS generates relatively small amounts. The underlying values may be substantial in many cases, but the amount actually settled and thus paid is very limited compared to other flows in RIX. The amounts are netted in the ONBS system and only a small amount is finally settled in RIX.

Account-based retail payments are managed through BGC. This involves the majority of all payments to and from individuals and most companies in the form of salary payments, card purchases and supplier payments. The amounts handled in BGC's system averaged SEK 28 billion per day during the period. After netting in BGC, only an average of SEK 15 billion remained to be paid daily between the major banks.

In terms of clearing and settlement, foreign exchange trading can be managed in two different ways. The options are either CLS or a correspondent bank. The majority of these payments, SEK 387 billion per day during the period, were cleared and netted in CLS. When the amount has been netted, there remains on average only SEK 24 billion per day to be finally settled in RIX. If CLS is not used, the payments go via a correspondent bank. If the payments are passed on to other Swedish banks, they go via RIX. The amount reported for this type of foreign exchange transaction averaged SEK 17 billion per day during the period.

One of the largest items in RIX is cross-border payments. Over the period, these accounted for an average of SEK 223 billion per day. The correspondent bank model can also be used for these payments. If the recipient Swedish bank has accounts at the foreign bank, no transaction will be required in RIX. This means that the reported average value of SEK 223 billion per day only covers the payments made between the Swedish banks, where one bank has acted as a correspondent bank for the other. The total value of the cross-border payments is therefore probably much higher.

Domestic payments comprise not only payments that arise in the shortest segment of the money market but also purely interbank payments. An interbank payment can arise, for instance, when a company needs to make a quick payment to another company and the sending and receiving companies have different banks. In this case, payment will go through RIX. An ordinary, fairly small payment can go through BGC. If the payment in question is large and urgent, it can be settled immediately and can then appear in the statistics as a domestic interbank payment.

# Annex 1. Tables

**Table A. Equities trading, turnover value and year-end market value on Stockholmsbörsen SEK billion**

	TURNOVER VALUE	YEAR-END MARKET VALUE
1994	659	976
1995	665	1,179
1996	918	1,688
1997	1,346	2,164
1998	1,830	2,413
1999	2,609	3,717
2000	4,456	3,583
2001	3,994	2,856
2002	2,702	1,780
2003	2,453	2,314
2004	3,391	2,699
2005	3,764	3,507
2006	5,519	4,227

Source: ONBS

**Table B. Issuers and investors in the bond and money markets SEK billion**

	1998	1999	2000	2001	2002	2003	2004	2005	2006
<b>Issuers in the bond market</b>									
Central government	808	796	719	623	660	732	772	769	766
Mortgage institutions	657	591	505	462	488	549	552	685	747
Other credit market companies	40	38	40	42	45	52	59	61	74
Non-financial companies	85	99	123	146	119	122	113	137	158
Local governments	8	8	6	8	26	14	13	16	20
Banks	46	44	39	32	36	46	70	91	115
<b>Total</b>	<b>1,644</b>	<b>1,577</b>	<b>1,432</b>	<b>1,314</b>	<b>1,374</b>	<b>1,516</b>	<b>1,579</b>	<b>1,758</b>	<b>1,879</b>
<b>Issuers in the money market</b>									
Central government	231	250	271	230	240	269	267	294	259
Mortgage institutions	55	88	79	43	88	104	93	72	113
Other credit market companies	16	18	16	16	18	16	12	10	9
Non-financial companies	43	53	55	83	78	51	62	62	66
Local governments	5	6	7	7	6	5	5	6	7
Banks	20	36	19	18	32	45	47	69	62
<b>Total</b>	<b>369</b>	<b>451</b>	<b>448</b>	<b>396</b>	<b>463</b>	<b>490</b>	<b>486</b>	<b>515</b>	<b>516</b>
<b>Investors in the bond market</b>									
AP funds	446	370	307	105	93	113	126	134	157
Insurance companies	441	472	462	455	493	542	599	613	701
Banks	231	193	186	141	140	177	129	262	281
Non-residents	231	250	224	290	402	455	529	638	409
Companies and others	295	292	253	323	246	228	196	112	330
<b>Total</b>	<b>1,644</b>	<b>1,577</b>	<b>1,432</b>	<b>1,314</b>	<b>1,374</b>	<b>1,516</b>	<b>1,579</b>	<b>1,758</b>	<b>1,879</b>
<b>Investors in the money market</b>									
AP funds	5	51	98	12	2	2	2	7	3
Insurance companies	40	48	38	46	134	126	117	138	88
Banks	115	88	91	138	141	137	152	129	151
Non-residents	68	72	53	91	75	85	82	75	52
Companies and others	141	192	168	109	111	140	133	166	222
<b>Total</b>	<b>369</b>	<b>451</b>	<b>448</b>	<b>396</b>	<b>463</b>	<b>490</b>	<b>486</b>	<b>515</b>	<b>516</b>

Sources: Statistics Sweden, annual reports (AP funds) and the Riksbank

**Table C. Average turnover per day in the bond market  
SEK billion**

	GOVERNMENT BONDS	MORTGAGE BONDS
1998	36.4	9.5
1999	32.0	10.1
2000	21.3	8.5
2001	21.5	7.4
2002	19.8	6.5
2003	19.5	9.5
2004	22.5	9.1
2005	28.1	9.5
2006	29.5	10.2

Source: The Riksbank

**Table D. Average turnover per day in the money market  
SEK billion**

	TREASURY BILLS	MORTGAGE CERTIFICATES
1998	14.0	1.3
1999	12.4	2.0
2000	9.1	3.0
2001	9.9	1.7
2002	9.0	3.6
2003	10.6	3.4
2004	12.2	3.1
2005	9.9	2.0
2006	10.4	2.7

Source: The Riksbank

**Table E. Average turnover per day in repos  
SEK billion**

1998	130
1999	113
2000	95
2001	110
2002	131
2003	124
2004	123
2005	141
2006	176

Source: The Riksbank

**Table F. Average turnover per day in the Swedish foreign exchange market  
SEK billion**

	SPOT	FORWARDS	OPTIONS	FX SWAPS	SHORT SWAPS
1998	30	6	3	27	38
1999	31	7	2	32	42
2000	32	9	4	42	61
2001	35	13	7	60	69
2002	37	14	13	56	76
2003	41	14	31	49	74
2004	50	14	8	55	79
2005	58	17	12	66	116
2006	70	23	14	75	128

Source: The Riksbank

**Table G. Total assets and asset composition of the financial intermediaries  
at the end of 2006  
SEK billion**

	TOTAL ASSETS/ INVESTMENT ASSETS	LENDING TO THE PUBLIC	OTHER LENDING	DEBT SECURITIES	EQUITIES	OTHER
<b>Credit institutions</b>						
Banks	5,150	1,995	1,494	790	381	489
Mortgage institutions	1,831	1,663	113	30	7	17
Other credit market companies	691	422	62	192	10	5
<b>Total Credit institutions</b>	<b>7,672</b>	<b>4,080</b>	<b>1,670</b>	<b>1,012</b>	<b>398</b>	<b>511</b>
<b>Investors</b>						
Insurance companies	2,418	28	21	1 093	1 204	72
AP-funds	929	-	-	318	516	95
Fund management companies	1,456	-	-	307	1,000	148
<b>Total Investors</b>	<b>4,803</b>	<b>28</b>	<b>21</b>	<b>1,400</b>	<b>2,204</b>	<b>1,150</b>
Securities companies	23	3	11	0.3	2	7

Sources: Statistics Sweden, annual reports and the Riksbank

Note that Column 1 displays total assets for banks, mortgage institutions, other credit market companies and securities companies but the invested assets of insurance companies and AP funds and assets under management by fund management companies.

**Table H. Lending to the public by credit institutions**  
SEK billion

	TOTAL	BANKS	MORTGAGE INSTITUTIONS	OTHER CREDIT- MARKET COMPANIES
1990	1,961	922	793	247
1991	2,039	909	933	198
1992	2,074	924	942	208
1993	1,948	749	993	206
1994	1,863	705	971	186
1995	1,873	701	990	183
1996	1,939	727	1,016	196
1997	2,064	842	1,008	214
1998	2,206	941	1,017	248
1999	2,330	1,016	1,050	265
2000	2,542	1,189	1,070	284
2001	2,765	1,330	1,130	305
2002	2,883	1,361	1,196	327
2003	2,961	1,337	1,283	341
2004	3,177	1,426	1,393	358
2005	3,614	1,701	1,528	384
2006	4,080	1,995	1,663	422

Source: The Riksbank

**Table I. Mortgage institutions' borrowing**  
SEK billion

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Certificates	66	115	130	136	171	182	171	175	146
Bonds and debenture loans	762	708	634	604	649	744	743	861	1 051
Inter-group borrowing	141	169	203	252	237	236	352	363	403
Other borrowing	69	20	14	10	9	9	31	24	0
Total	1,037	1,011	980	1,003	1,066	1,172	1,297	1,423	1,600

Source: The Riksbank

**Table J. The banks' assets**  
SEK billion

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Lending to Swedish public	702	770	864	972	996	993	1,016	1,156	1,317
Lending to foreign public	239	246	325	359	365	344	410	546	678
Lending to foreign banks	387	391	479	501	471	454	627	676	732
Lending to Swedish financial institutions	254	275	380	367	363	413	487	612	713
Debt securities	453	385	387	430	472	508	555	724	790
Other	382	409	536	530	613	569	806	870	919
Total	2,417	2,476	2,972	3,160	3,281	3,280	3,901	4,583	5,150

Source: The Riksbank

**Table K. The banks' liabilities and equity capital  
SEK billion**

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Deposits from Swedish public	778	829	870	928	968	1,005	1,055	1,183	1,323
Deposits from foreign public	169	141	247	259	277	291	328	363	408
Deposits from Swedish financial institutions	182	160	170	222	160	160	170	183	223
Deposits from foreign banks	506	441	587	660	668	627	897	1,035	1,148
Securities issued	241	301	329	390	378	350	428	643	752
Other	433	492	633	534	675	681	811	948	1,058
Equity capital	108	111	136	167	155	166	212	227	238
<b>Total</b>	<b>2,417</b>	<b>2,476</b>	<b>2,972</b>	<b>3,160</b>	<b>3,281</b>	<b>3,280</b>	<b>3,901</b>	<b>4,583</b>	<b>5,150</b>

Source: The Riksbank

**Table L. The banks' lending to and deposits from the public  
SEK billion**

	NON-FINANCIAL COMPANIES	HOUSE- HOLDS	LOCAL GOVERNMENT	FOREIGN PUBLIC	OTHERS
<b>Lending</b>					
1998	447	208	28	239	19
1999	495	226	35	246	13
2000	551	259	33	325	21
2001	644	275	33	359	19
2002	641	289	33	365	32
2003	618	292	30	344	52
2004	637	307	31	410	41
2005	752	345	31	546	28
2006	840	395	30	678	53
<b>Deposits</b>					
1998	271	425	22	169	60
1999	313	427	20	141	69
2000	360	414	16	247	79
2001	390	487	18	259	33
2002	403	520	16	277	25
2003	387	521	20	291	77
2004	399	537	26	328	93
2005	462	584	28	363	109
2006	517	676	27	408	103

Source: The Riksbank



**Table M. The banks's average deposit and lending rates and Treasury bill yields**  
Per cent

	LENDING RATE	DEPOSIT RATE	TREASURY BILLS YIELD, 6-MONTH
98-12-31	5.94	1.91	3.49
99-03-31	5.47	1.57	2.95
99-06-30	5.27	1.34	3.09
99-09-30	5.23	1.34	3.44
99-12-31	5.53	1.65	3.78
00-03-31	5.76	2.02	4.21
00-06-30	5.71	2.04	4.07
00-09-30	5.79	2.01	4.09
00-12-31	5.82	2.15	4.23
01-03-31	5.80	2.17	3.94
01-06-30	5.84	2.26	4.45
01-09-30	5.72	2.16	3.78
01-12-31	5.55	2.10	3.74
02-03-31	5.65	2.20	4.42
02-06-30	5.94	2.51	4.37
02-09-30	5.95	2.54	4.17
02-12-31	5.63	2.26	3.58
03-03-31	5.44	2.08	3.38
03-06-30	5.03	1.65	2.63
03-09-30	4.81	1.46	2.68
03-12-31	4.79	1.51	2.65
04-03-31	4.51	1.33	2.11
04-06-30	4.12	0.98	2.07
04-09-30	4.10	0.97	2.13
04-12-31	4.00	1.00	2.03
05-03-31	3.91	1.00	2.01
05-06-30	3.59	0.79	1.50
05-09-30	3.30	0.74	1.56
05-10-31	3.35	0.72	1.53
05-11-30	3.33	0.71	1.58
05-12-31	3.31	0.79	1.95
06-03-31	3.63	1.05	2.11
06-06-30	3.82	1.24	2.41
06-09-30	4.04	1.48	2.82
06-12-31	4.35	1.87	3.13

Source: The Riksbank

Note. From September 2005 onwards major amendments have been made to the statistics.

**Table N. Mortgage institutions' lending to the public**  
SEK billion

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Single-family dwellings	463	499	511	555	603	673	749	869	966
Apartment blocks	443	428	418	419	415	400	400	395	391
Commercial and office premises	35	35	37	40	34	33	28	28	28
Tenant-owned apartments	33	44	58	75	96	119	152	196	240
Other	40	42	44	37	40	42	40	40	37
Total	1,014	1,048	1,068	1,126	1,187	1,267	1,369	1,528	1,663

Source: The Riksbank

**Table O. New lending by mortgage institutions according to original fixed-rate term**  
Per cent

NEW LOANS PER MONTH	1998	1999	2000	2001	2002	2003	2004	2005	2006
Variable rate	28.5	49.4	64.8	51.1	53.5	40.4	54.8	49.5	54.1
Interest rate period < 5 years	28.2	24.0	21.0	32.5	31.7	42.0	32.3	31.5	27.3
Interest rate period > 5 years	43.3	26.6	14.1	16.4	14.8	17.6	13.0	19.0	18.6

Source: The Riksbank

**Table P. Loan stock of mortgage institutions according to original fixed-rate term**  
SEK billion

AT MONTH END	1998	1999	2000	2001	2002	2003	2004	2005	2006
Variable rate	147	232	344	386	426	402	496	571	654
Interest rate period < 5 years	372	323	261	306	356	487	615	617	639
Interest rate period > 5 years	496	493	463	438	415	395	283	340	370
Total	1,015	1,048	1,068	1,130	1,196	1,283	1,393	1,528	1,663

Source: The Riksbank

**Table Q. Mortgage institutions' borrowing**  
SEK billion

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Certificates	66	115	130	136	171	182	171	175	146
Bonds and debenture loans	762	708	634	604	649	744	743	861	1,051
Inter-group borrowing	141	169	203	252	237	236	352	363	403
Other borrowing	69	20	14	10	9	9	31	24	0
Total	1,037	1,011	980	1,003	1,066	1,172	1,297	1,423	1,600

Source: The Riksbank

**Table R. Lending to the public by other credit market companies**  
SEK billion

	COMPANIES	HOUSE-HOLDS	LOCAL GOVERNMENT	FOREIGN PUBLIC	OTHERS
1995	93	47	10	32	0
1996	99	53	13	32	0
1997	104	56	16	38	0
1998	125	64	18	41	0
1999	131	75	16	43	0
2000	134	80	19	51	0
2001	125	88	24	66	3
2002	139	94	29	60	5
2003	145	104	34	52	5
2004	149	115	37	54	4
2005	166	118	38	59	4
2006	183	123	40	72	4

Source: The Riksbank

**Table S. Insurance companies' investment assets**  
SEK billion

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Non-life insurance companies	316	334	350	346	331	329	363	420	439
Life insurance companies	1,141	1,430	1,478	1,436	1,281	1,443	1,567	1,833	1,979
<b>Total</b>	<b>1,458</b>	<b>1,764</b>	<b>1,828</b>	<b>1,782</b>	<b>1,612</b>	<b>1,771</b>	<b>1,930</b>	<b>2,253</b>	<b>2,418</b>

Source: Statistics Sweden

**Table T. Insurance companies' allocation of investment assets**  
SEK billion

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Equities	672	902	892	861	589	697	807	1,051	1,204
Bonds	620	653	713	695	725	783	844	894	953
Short-term investments	59	72	60	86	175	176	160	188	140
Loans	38	50	66	71	55	57	59	51	49
Property	69	87	96	68	68	59	61	70	72
<b>Total</b>	<b>1,458</b>	<b>1,764</b>	<b>1,828</b>	<b>1,782</b>	<b>1,612</b>	<b>1,771</b>	<b>1,930</b>	<b>2,253</b>	<b>2,418</b>

Source: Statistics Sweden

**Table U. Banknotes and coins in circulation in relation to GDP in the Nordic countries**  
Per cent

	SWEDEN	DENMARK	FINLAND	NORWAY
1992	3.9	2.9	2.0	4.4
1993	3.9	3.0	2.2	4.0
1994	3.8	3.0	2.1	4.2
1995	3.6	3.0	2.2	4.1
1996	3.6	2.9	2.3	3.9
1997	3.6	2.9	2.2	3.8
1998	3.6	3.0	2.2	3.7
1999	3.7	3.0	2.3	3.5
2000	3.7	2.9	2.2	2.9
2001	3.8	2.9	1.8	2.8
2002	3.8	2.8		2.7
2003	3.8	2.9		2.6
2004	3.7	3.0		2.5
2005	3.6	3.0		2.4
2006	3.4	3.0		2.1

Source: Central banks of the different countries

Note: No figures are given for Finland after 2001 as the Eurosystem's reporting of the Euro banknotes affects the amount of the banknotes in circulations since January 2002. This has meant that Finland's banknote figure is not comparable with previous years.

**Table V. Use of different payment instruments**

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Number of transactions, millions												
Cheques	46	40	18	4	4	2	2	2	1	1	1	1
Credit cards	42	44	48	53	57	67	76	80	89	177	184	195
Debit cards	59	88	121	160	198	256	327	541	670	778	887	994
Paper-based credit transfer	189	196	208	175	171	154	128	132	83	89	87	86
Electronic credit transfer	431	441	452	549	626	639	636	304	335	376	426	487
Direct debit	50	54	65	74	85	91	98	119	130	143	160	197
<b>Total</b>	<b>817</b>	<b>863</b>	<b>912</b>	<b>1,014</b>	<b>1,140</b>	<b>1,209</b>	<b>1,267</b>	<b>1,178</b>	<b>1,308</b>	<b>1,563</b>	<b>1,746</b>	<b>1,959</b>
Value of transactions, SEK billion												
Cheques	..	..	..	43	30	22	16	21	46	59	55	54
Credit cards	38	44	47	52	55	68	75	68	77	90	80	94
Debit cards	48	57	77	97	119	143	186	297	287	296	334	358
Paper-based credit transfer	1,946	1,656	1,973	1,407	1,388	1,330	1,190	854	552	475	437	384
Electronic credit transfer	4,405	5,076	5,344	8,282	7,231	7,580	7,341	5,348	5,803	6,631	7,512	8 484
Direct debit	194	202	193	210	227	257	261	250	268	302	344	387
<b>Total</b>	<b>6,631</b>	<b>7,035</b>	<b>7,634</b>	<b>10,090</b>	<b>9,050</b>	<b>9,400</b>	<b>9,068</b>	<b>6,837</b>	<b>7,032</b>	<b>7,853</b>	<b>8,763</b>	<b>9,762</b>

Source: The Riksbank

**Table X. Number of card transactions per capita in the Nordic countries**

	SWEDEN	DENMARK	FINLAND	NORWAY
1990	2	12	25	4
1991	4	17	32	5
1992	5	21	35	8
1993	7	33	34	12
1994	9	40	38	17
1995	11	48	48	27
1996	15	54	51	58
1997	19	61	53	72
1998	24	68	58	85
1999	29	74	63	97
2000	36	80	71	111
2001	45	87	76	124
2002	66	94	85	137
2003	85	105	99	154
2004	109	120	111	170
2005	117	123	128	186
2006	130			207

Sources: ECB and Norges Bank

**Table Y. Number of Internet bank customers  
Thousands**

1998	628
1999	1,540
2000	2,728
2001	3,900
2002	4,575
2003	5,225
2004	5,850
2005	6,461
2006	7,210

Source: The Swedish Banker' Association

Note. When interpreting the data on the number of Internet bank customers it should be noted that the same person can be a customer of several Internet banks.

**Table Z. ATM's and payment terminals**

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<b>ATM's</b>												
Number of ATM's	2,359	2,379	2,370	2,485	2,580	2,617	2,567	2,647	2,676	2,701	2,800	2,807
Number of trans- actions, millions	281	297	312	333	310	321	335	321	328	320	316	315
Value of trans- actions, SEK billion	226	239	249	287	257	271	282	269	276	274	275	278
<b>Payment terminals</b>												
Number of terminals, thousands	59.4	71.4	83.8	94.4	106.1	121.3	124.7	142.0	153.1	161.1	176.6	182.6
Number of trans- actions, millions	92	111	141	171	227	256	326	454	542	616	755	968
Number of trans- actions, SEK billion	53	69	84	92	127	143	185	211	241	269	299	366

Source: The Riksbank

**Table AA. Payment flows in the Swedish financial infrastructure  
Daily amounts in SEK billion**

	2004	2004	2005	2005	2006	2006	2007	2007
DATA FROM FEBRUARY	GROSS	SETTLE- MENT <sup>3</sup>	GROSS	SETTLE- MENT <sup>3</sup>	GROSS	SETTLE- MENT <sup>3</sup>	GROSS	SETTLE- MENT <sup>3</sup>
Fixed income market <sup>1</sup>	370	370	341	341	463	463	452	452
Stock market <sup>1</sup>	27	27	26	26	35	35	42	42
Liquidity bridge between RIX and RIX accounts administered by VPC <sup>1</sup>	N/A	47.7	N/A	36.2	N/A	62.5	N/A	44.4
Derivatives market	1.0	0.1	1.0	0.1	0.5	0.1	0.4	0.2
Retail payments	22	10	20	11	29	13	28	15
Foreign exchange transactions via CLS <sup>2</sup>	160	18	221	21	366	26	387	24
Other foreign exchange transactions	<sup>4</sup>	27	<sup>4</sup>	18	<sup>4</sup>	24	<sup>4</sup>	17
Cross-border payments	<sup>4</sup>	228	<sup>4</sup>	179	<sup>4</sup>	238	<sup>4</sup>	223
Domestic payments + miscellaneous	<sup>4</sup>	121	<sup>4</sup>	114	<sup>4</sup>	122	<sup>4</sup>	154

<sup>1</sup> Up until November 2003 amounts from the fixed-income and equity market were netted in VPC's clearing so that only the net was settled in RIX. From 2004 gross amounts are settled in the RIX accounts administered by VPC. This reorganisation also means that liquidity transfers have been enabled so that RIX participants can transfer liquidity between RIX and the special RIX accounts administered by VPC.

<sup>2</sup> SEK was included in CLS in September 2003. Therefore the figures for foreign exchange transactions in CLS are given for 2004 and onwards.

<sup>3</sup> Settlement refers to the settlement that takes place in the Riksbank's RIX system.

<sup>4</sup> The Riksbank has no information about these gross flows.

Sources: VPC, Stockholmsbörsen, BGC, CLS and the Riksbank

## ■ Annex 2. Market conventions in the Swedish fixed income market and the market in SEK

### **A. Conventions in the Swedish bond market**

Day count basis: Bonds have 30E/360 days per year.

Coupon Frequency: Annual coupon.

Quotations Basis: Prices /interest rates are to be expressed in decimals.

Trade Date: Designated as T.

Maturities: The designation of the bond indicates the maturity.

Common maturities are, for instance, 2, 5 and 10 years. Longer maturities also occur.

Value Date: Three business days from the trade date (also called T+3)

When the bond's maturity becomes shorter than a year, it is called a Period Bond (the bond is traded T+2).

### **B. Conventions in the Swedish money market**

Day count basis: Deposits, repo rates, T-bills and bank, mortgage and Riksbank certificates actual number of days/360 days per year (Actual/360).

Quotations Basis: Prices/interest rates are to be expressed in decimals.

Trade Date: Designated as T.

Maturities: Up to 12 months. Common maturities are, for instance, 1, 3, 6, 9 and 12 months.

Value Date: Two business days from the trade date (also called T+2).

### **C. Conventions in the money market's shortest segment**

Day count basis: Deposits and repos and the Riksbank's repos:

Actual number of days/360 days per year (Actual/360).

Quotations Basis: Prices/interest rates are to be expressed in decimals.

Trade Date: Designated as T0.

Value Date: O/N (overnight) = Today (T0) to tomorrow (T1)

T/N (tomorrow/next) = Tomorrow (T1) to the day after tomorrow (T2)

S/N (spot/next) = The day after tomorrow (T2) to the day after (T3)

1w (one week) = The day after tomorrow (T2) and a week thereafter (T2 to T9)

### **D. Conventions for the market in Swedish kronor**

Foreign Exchange Quotation: 1 euro = x units SEK

Quotations Basis = Prices/interest rates are to be expressed in decimals

Trade Date: Designated as T.

Value Date: Two bank days from the trade date (also called T+2).











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