



Sveriges Riksbank

# Financial Stability Report October 1999

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# Foreword

The promotion of a secure and efficient payment system is one of the Riksbank's primary functions. The purpose of the Financial Stability Report is to present the Riksbank's appraisal of trends in the financial system and their implications for stability. The report is also intended to stimulate a discussion of matters that concern payment system stability.

The report begins with a summary and the Riksbank's conclusions on the stability of the payment system. The analysis on which the conclusions are based is then presented. Trends in the bank sector are discussed in Chapter 1 of the report. The banks' credit risks in relation to macroeconomic trends are described in Chapter 2. As before it should be noted that the account is not to be interpreted as a vehicle

for monetary policy signals. Chapter 3 contains a discussion of counterparty and settlement risks. Chapter 4 contains the Riksbank's assessment of the risks in the financial system in conjunction with the millennium transition.

The Financial Stability Report presents the basic outlines of the reports and discussions on the stability of the payment system that took place in the Executive Committee on 5 and 21 October 1999.

*Stockholm, October 1999*

Urban Bäckström  
Governor of Sveriges Riksbank

# Summary and conclusions

The Riksbank's analysis of the stability of the financial system is focused on an appraisal of the risks in the bank system in three main components, which in principle, correspond to different time horizons for the appraisal of risks in the bank sector. The first component corresponds to a long-term approach to risk where the focus is on the banks' ability to create profitability over the foreseeable future. The second component has a medium-term perspective, where the risks for loan losses are primarily appraised taking into consideration the general development of the economy. Finally, the third component focuses on the risk exposures that arise in financial operations, which can lead to very sudden losses. The analysis of this component has accordingly a more short-term perspective. In addition to the areas of risk mentioned above, this report also contains an appraisal of the special risk for the financial sector that the transition to the new millennium entails.

## Trends in the bank sector

Important factors that can affect the profitability of the Swedish bank sector in the longer term today are the increasing use of financing by the markets, so called disintermediation, increased investment in the Nordic countries and technical development. The trend to increased disintermediation on the banks' liability side, discussed in previous reports, is continuing. What is new, however, is that we are now beginning to see clearer tendencies to disintermediation on the assets side. Above all, changes are noticeable in the fast growth in euro-denominated corporate bonds in Europe. The first six months this year, this increase has been 170 per cent. These developments may be a threat to banks' profitability. However, it

is at the same time positive from the point of view of stability as credit risks are in this way moved away from the banks.

The Nordic and Baltic expansion among the major banks has meant that the banks will become increasingly dependent on developments in other countries. However, the total exposure, both from the point of view of earnings and credit risk, is still relatively small. The exception is MeritaNordbanken which naturally has a large exposure in both Sweden and Finland, and possibly also in Norway, if the offer for Kreditkassen is successful.

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Technological development is a major strategic challenge to the banks.

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Technological development is a major strategic challenge to the banks. The Swedish banks are well to the fore as far as internet banking services are concerned. To date, this has mainly entailed development costs and it remains to be seen whether the banks will be able to generate the anticipated increased income and cost savings. Technical development entails increased exposure to operational risks which makes new demands on both bank managements and authorities.

The banks are reporting good profits. This is largely due to continued low loan losses, which will probably increase in the event of a decline in economic activity. One of the greatest challenges for the banks is to maintain sufficient margins to cover any losses during downturns. There is a general trend towards increased costs in the bank sector which leads to a negative development of underlying profitability. Both the Nordic expansion and the development of IT have contributed to the negative development of costs while the effect of these investments has to date been less on the income side.

## Macroeconomic trends and credit risks at the banks

Macroeconomic trends affect the banks' credit risks. Loan losses are normally low in an upswing and increase during a downturn. In an economic upswing, the analysis of the Riksbank must be focused on finding indications of the build-up of risk and financial imbalances, which can lead to large loan losses at a later phase of the cycle.

At present, the Swedish economy is developing strongly. GDP for the second quarter of 1999 increased by 3.2 per cent compared with the same period in 1998. This positive trend combined with positive forecasts for the coming years is reflected in both households' and businesses' expectations about the future.

The corporate sector was responsible for the largest part of the banks' loan losses during the bank crisis at the beginning of the 1990s. Lending to the corporate sector is continuing to expand, while in the light of the strong growth of the economy, the increase in lending seems to be balanced. The risks for bankruptcies in the corporate sector are low at present; the economic environment is favourable and stable. At the level of individual corporations, the increased interest coverage ratio and the decreased debt-equity ratio indicate that solvency will continue to improve. This is also confirmed by the continued decrease in banks' loan losses. They are now at a historically low level. The conclusion from the previous report, that businesses can encounter a weaker macroeconomic development without this leading to widespread suspensions of payments and thus problems for the bank sector therefore remains valid.

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Household lending has also increased since the previous report, which is mainly explained by low nominal interest rates, rising house prices, and increased

optimism about the development of the economy. Nominal interest rates are low at present, but inflation is also low, which means that real interest rates are relatively high. The increased indebtedness means that the vulnerability of households to higher nominal interest rates has increased slightly. At the same time, it should be underlined that indebtedness is considerably lower than at the end of the 1980s. Sensitivity to interest rates is reinforced by an increasing number of households choosing variable interest rates for their loans, which means that changing interest rates have a rapid impact on household finances. The household sector's ability to pay can be expected to improve slightly during the next few years, mainly due to a more expansive fiscal policy. However, new saving is relatively low, which may be explained by the fact that households spend against the background of increasing but unrealised asset values. At the same time, as households are sensitive to interest rates, it should be borne in mind that the risk for rising interest rates coinciding with a poorer development of household income is low. Should there be a cyclical downturn, this would presumably coincide with lower interest rates, as the present monetary policy is designed with a variable exchange rate and an inflation target. Households have also historically only caused comparatively small loan losses for the banks.

The property sector is analysed separately as a large part of the banks' corporate loans are to this sector and the development of profitability therefore has a great influence on the banks' credit risks and earnings. Furthermore, mortgages are the most important form of collateral in the credit market. Property prices in the big city regions have increased during the first half of 1999. A comparison between the direct return on property investments and risk-free interest rate indicates that the rate of price increases for commercial premises seems to be in balance while the trend in the housing sector stands out more, with an increase in prices for the first six months of 1999 of 22 per cent. Unlike the trend at the end of the 1980s, the strong price increases are primarily concentrated to the big city regions, how-

ever. The increased prices are explained by conversion to tenant-owned apartments, and an increasing demand for apartments in the less attractive areas of the big cities. Expectations of a loosening of the rent control system and expectations of a sale of property to the tenants, can also contribute to the higher prices. Price increases that are caused by expectations may be particularly risky, as substantial price corrections may occur, in case the expectations are not fulfilled. At the same time as the price trend is dramatic, the concentration to the big cities means that the total loss risk for the banks is less in the event of a fall in prices.

The solvency of property companies has improved, which is natural given today's strong cyclical development. The interest coverage ratio has continued to improve while the debt ratio has remained stable compared with previous year.

## Counterparty and settlement risks

By counterparty and settlement risks are meant the credit risks that arise in trade in the financial markets, primarily between financial companies. The Riksbank's measurement of exposure to these risks shows that individual exposures in the big banks can be of such a size that the banks could encounter considerable problems even in the event of the failure of a single counterparty. In the view of the Riksbank, the levels that the individual exposures can amount to are a problem from the point of view of system security. To some extent, this is a result of the Swedish bank system's high concentration to a few large players. One problem with the rules on large exposures that the Riksbank has previously highlighted is that the majority of large exposures with a short maturity and to financial companies are in practice not subject to the regulations.

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To some extent the banks have improved their risk management within the area of counterparty and settlement risks during the past year, partly as a result of experiences from last autumn. Settlement limits for FX have been introduced, however, the limit systems lack incentives to bring down counterparty exposures which is a problem. It may be necessary that the authorities tighten their requirements on the banks in this respect.

It is positive that netting in the derivatives market seems to be well-developed in the banks. Netting agreements are used to a great extent for the largest counterparties and, to the extent that agreements are lacking, improvements are aimed at. One way of further reducing exposures in the derivatives market is to use collateral to a greater extent, which generally does not seem to be so widely spread yet in the Swedish market. High costs in relation to the size of the trade are one reason given by the banks. Similarly, there is a potential for reduced exposures in the derivatives market by use of centralized clearing although this would mainly seem to be used for exchange traded products where clearing is the norm in the market. An increased use of netting agreements in the market for interbank ledning may be desirable, in cases where there are opposite positions in the market.

EMU has to some extent meant a potential for reduced counterparty and settlement risks for the banks. The banks do not need to use correspondent banks for payments and FX trade in the same way as before which has led to a reduced need of loans in the form of deposits in foreign banks. TARGET and the other payment systems also for euro payments mean that the settlement cycle for payments deriving from FX trade can be reduced. However, it is difficult to quantify how great the risk reduction effect has been.

## Year 2000

Swedish financial institutions completed before the summer all testing and adaptation of computer systems for the year 2000. Finansinspektionen (the

financial supervisory authority) has studied special reports concerning the contingency planning of institutions and has concluded that all major Swedish institutions have adopted plans that meet supervisory requirements based on the recommendations made by the Basel Committee for bank supervision and the Joint Year 2000 Council.

The financial market participants are well aware of the problems that could arise in connection with year 2000. The market participants have reached agreement on measures to reduce unnecessary settlement and clearing volumes during the critical period. The measures will be taken to reduce the load on vital parts of the financial infrastructure during the transition period. This will be done without disturbing the functioning of the markets.

Swedish banks that have access to the RIX-system have the right to borrow as much as the bank requires against collateral. Liquidity will be available to the extent that the banks have eligible collateral that can be pledged.

The Riksbank is fully prepared for the transition. The RIX-system has been tested in detail and shows no signs of weaknesses related to the millennium transition. Furthermore, the Riksbank has a sufficient supply of cash and well-developed distribution procedures to accommodate the individuals that wish to withdraw extra cash.

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The Riksbank does not expect that the millennium transition will lead to any more serious disruptions. As the adaptation to the 2000-related problems is

very complex and all-inclusive, it is reasonable to assume that there will be some glitches in computer systems. These may lead to minor disturbances of a limited duration. Given the contingency procedures that exist in the financial markets, the Riksbank expects that the activity of the financial system will continue as normal in Sweden.

## Overall assessment

As a summary conclusion the Swedish financial system is considered to be stable, although there are some signs of a build-up of risks relative to our previous report. The foremost risks the Riskbank wishes to emphasize are:

- A declining trend of non-temporary revenues in the banks, in spite of good present profitability and low credit losses.
- A tendency towards increasing risks in the household sector due to a not insignificant increase in borrowing, increased debts relative to disposable incomes and increasing prices for houses and apartments.
- Rapid price increases and low direct yields for apartment blocks in the big city regions.
- The considerable exposure counterparty and settlement risks in Swedish banks implies a contagion risk should one bank run into a problem.

# Introduction

The Riksbank's analysis of the stability of the payment system is focused on three main components:

- The *general trend* in the bank sector—the development of the competitiveness and profitability of the bank sector, particularly taking into consideration structural changes and the banks' strategic response to changes. Weak earning power at the banks reduces the ability to resist disruptions and risks leading to increased risk-taking, which in turn can lead to considerable losses and an increased risk for suspensions of payments. The effects that structural changes can have on other areas, for instance, credit risks, are also clarified here.
- The *credit risk* in the banks' lending to households and non-financial firms. It is the risks in the loan portfolio that have led to the largest losses for Swedish banks. The Riksbank monitors the macroeconomic development and the risk that this will entail substantial loan losses for the banks.
- *Counterparty and settlement risks* that arise in the banks' trading and taking of positions in the financial markets. Financial problems at one bank can spread to others by the exposures that arise on the interbank markets, thus affecting the entire financial system.

In principle, the three components correspond to different time horizons for the appraisal of the risks in the bank sector. The strategic risks correspond to a long-term approach to risk where the focus is on the banks' ability to create profitability over the foreseeable future. The long-term perspective is related to the fact that structural changes generally take

place gradually and therefore affect the banks' long-term activities.

The analysis of credit risks has a medium-term perspective where the risks for loan losses are appraised over a period of one or two years. It is primarily the general cyclical development that affects the risk for loan losses that is analysed. The time horizon can therefore not be longer than what can be surveyed when the cyclical development is assessed.

Exposures to counterparty and settlement risks finally can lead to sudden losses and the analysis has accordingly a more short-term perspective. This depends on the analysis in principle aiming at evaluating the consequences of a major individual counterparties suspending payments and the consequential effects that can give rise to. A short-term perspective also exists for other types of risks at the banks, for instance, market risks, liquidity risks and operational risks. The Riksbank has not made a closer examination of these risks to date, but there may be reason to focus more strongly on them in future.

In the first stability reports, basic reviews were made of the three components in the Riksbank's analysis of stability in the financial system. The intention has been to explain why the Riksbank views these areas as important and to provide an account of the analytical framework used. From spring 1999, the stability reports include a chapter for each of the three components containing an account of how the risk scenario has developed within each area. Chapter 4 deals with the Riksbank's appraisal of the special risks to the financial system due to the transition to the new millennium. The analysis of the review of the different components of risk are weighed together into a summary assessment of the stability of the financial system, which was presented at the beginning of the report.



# Trends in the bank sector

*The Swedish banks report good profitability and low loan losses which is natural taking into consideration the favourable development of the Swedish economy at present. However, the underlying earning power of the banks is declining and it is essential that they can deal with strategic challenges such as disintermediation, technological development and investments in the Nordic area to be able to maintain satisfactory profitability in the longer term.*

The Riksbank monitors developments in the bank sector as a whole to take note of circumstances that can have repercussions for the stability of the financial system. In previous reports, the Riksbank has discussed a number of factors that have led to structural pressure to change in the banking industry. These factors include increased competition from both domestic and international players, rapid technological development and changes in household savings behaviour. The choices made by banks to meet increased pressure to change are associated with strategic risks. The Riksbank has inter alia indicated how changed prerequisites can lead to decreasing profitability, which in certain circumstances can act as an incentive to greater risk-taking. However, structural changes do not only affect the banks' incentives and actions but can also have more fundamental repercussions on the stability of the financial system.

This chapter begins by taking up the disintermediation of saving and credits, and then describes technical development followed by the banks' increased investment in the Nordic area. Finally, an account is given of financial trends in the banking-system.

## Disintermediation of household savings and corporate borrowing

Disintermediation means that an increasing share of saving and the provision of credit takes place directly in the financial markets. In Sweden, this trend has to date mostly affected the banks' liability side in the sense that savings in the form of deposits have been reduced in favour of saving which is channelled directly to the financial markets. Among other things, this saving is directed towards shares, various types of funds, and insurance (see figure 1 in the Appendix).

Disintermediation of the banks' assets side, i.e. corporate borrowing taking place directly in the markets instead of at the banks, still does not occur to any greater extent in Sweden. The introduction of the euro has led to expectations of more liquid and efficient capital markets in Europe and that the prerequisites for issuing bonds will thereby be improved.

Within the euro area as a whole, developments have moved relatively swiftly since the monetary union was created. The issues of euro-denominated bonds issued by non-financial companies expanded by almost 170 per cent during the first six months of 1999 compared with the corresponding period in 1998. This can be compared with a reduction of approximately 25 per cent in central and local

government issues during the same period (see figure 1.1).<sup>1</sup> Accordingly, the non-financial companies shares of bond issues increased during the second quarter of 1999, accounting for around 19 per cent of issues, an increase by 13 percentage points compared with the corresponding period in 1998. During the same period, the share of total bond issues accounted for by central government bonds has decreased by 3 percentage points to just over 6 per cent.<sup>2</sup> The increase of issues of corporate bonds shows that lending directly in the market is beginning to be a competitive alternative to borrowing at banks in Europe. A study based on growth in corporate certificates and corporate bond markets in the USA during the 1980s and 1990s has shown that around a third of the corporate loans that are today placed in the European banks could be taken up directly in the market.<sup>3</sup> This provides an indication that a well-developed corporate bond market in Europe can, as in the USA, be a real alternative to borrowing at a bank.

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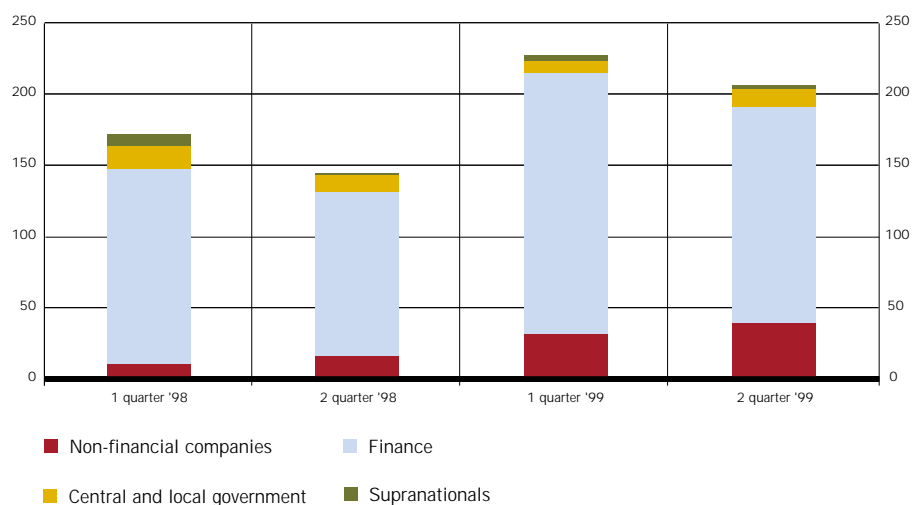
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In principle, the increased securitisation in companies means that the banks lose loans but are given the opportunity of generating fee incomes by organ-

ising issues. It is not certain that the loss of income from loans is greater than the increase fee income totally, although the banks may differ in their ability to compete in these two markets. For Swedish banks, which are small in a European context, it is probably difficult to appear as an attractive alternative to issuers of corporate bonds. In order to compete for fee income in a European market for corporate bonds, a large balance sheet is required which can absorb considerable volumes of the loans issued. Furthermore, a large capacity is required to distribute bonds to international institutional investors, which requires a broad network of customers. This applies above all to banks that focus their activity on offering financial services to major companies. For these companies, financing directly in the financial markets is a real alternative. A trend towards an increased proportion of securitisation also squeezes the margins in the banks' traditional corporate lending, since these customers to a greater extent can use the price conditions in the financial markets as guidelines in price negotiations with banks.

To the extent that this development also makes it appear possible for medium-sized enterprises to issue corporate bonds, the Swedish banks can probably be attractive intermediaries for issues. In these cases, knowledge of the company and contacts with Swedish investors are probably important.

**Figure 1:1.**  
Issue volumes per quarter in the market for guaranteed euro-denominated bonds, by issue categories.  
Euro Billion



Sources: Salomon Smith Barney and Capital Data Bondware.

Swedish businesses have been active and have carried out large issues in the euro market in 1999. However, the outstanding volume of corporate bonds and certificates decreased in the Swedish market during the second quarter of 1999, after a continual increase since 1995 (see figure 2 in the Appendix).

At the same time, as the increased securitisation can be a threat to the earnings of the Swedish banks, this trend should generally be viewed as contributing to reducing risks in the financial system. There are a number of reasons for this. Diversification of credit risks can increase by other investors than banks being able to purchase credit risks and that banks can invest in credit risks deriving from other geographical areas than their own area of operations. Trade with corporate bonds gives rise to a market price for credit risk, which has a valuable information content and can be used for credit risk modelling inter alia. It is also conceivable that the fee income that derives from, for instance, securitisation of loans, is a more stable source of income for banks than direct provision of credit, as loan losses do not affect the banks in the event of a cyclical downturn.<sup>4</sup> An increased securitisation should not therefore be viewed as negative from an official perspective, even though particular banks may be affected negatively in certain circumstances.

A special risk, to which attention can be drawn when banks offer issue services, is the credit lines that are often offered in conjunction with issuing commercial paper. In these cases, the banks guarantee that the issuing company receives loans at the bank if the quantity of certificates sold in the market is insufficient to cover the company's financing requirements. As it is conceivable that difficulties arise when there is turbulence in the market, this means that the banks' lending needs to increase at such times and with it their own financing requirements.

## Technical developments

The Riksbank's previous Stability Report<sup>5</sup> contained a discussion of the impact of technological development on banks' activities. This issue is very apposite

at present. A lot of space is devoted in the banks' income statements for the first half of 1999 to underlining how the development of internet-based banking services is progressing. The use of the internet to distribute financial services is growing very rapidly at present in Sweden, which has led to Swedish banks internationally being in the forefront with regard to the proportion of internet-based customers.

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There are a number of possible explanations why development in the Nordic market has been so fast with regard to development and use of a broad spectrum of bank services via internet. Factors that are usually mentioned are a generally positive attitude to technology, which contributes to new technical solutions being rapidly accepted and used, and that a considerable proportion of the population has access to computers (see figure 3 in the Appendix). In Sweden almost half of the population had access to a computer at home in 1998, which provides good conditions for the use of internet. An important explanation for this is that the widespread existence of leasing agreements where employees are given the opportunity of leasing a computer on favourable tax conditions.

The deregulation of the telecommunications market is probably one of the most important driving forces behind the rapid expansion of internet use in Sweden. The stiffer competition among net operators has meant that it is relatively cheap for customers to use internet. The significant internet pen-

1 Source: Capital Data Bondware and Salomon Smith Barney. The figures cover all markets and include all euro-denominated government and non government bond issues. The figures exclude all domestic central government debt, however, which is apportioned by an auction procedure.

2 See footnote 1.

3 McCauly, R.N. and W.A. White (1997). "The Euro and European Financial Markets" in P.R. Masson, T.H. Kreuger and B.G. Turtleboom, eds., "EMU and the international monetary system", Washington: International Monetary Fund.

4 See inter alia Financial Market Report 1997:1 and "Värdepapperisering - en framtida finansieringsform" by Martin Blåvarg and Per Lilja, Penning- & Valutapolitik 1998:3 for a more detailed discussion of the positive effects on the financial system of increased securitisation.

5 Financial Stability Report 1999:1.

etration in the Swedish market (see figure 1:2) has probably also contributed to there being a sufficiently large customer base for banks to find it motivated to make the necessary investments.

This development has led to Swedish banks being in the forefront in an international comparison with regard to the development of internet-based services. A comparison between the 12 banks in Europe with the most internet customers showed that three Swedish banks were at the top. A further Swedish bank was among the six foremost (see figure 1:3).<sup>6</sup>

It has been possible to make the distribution of financial services more efficient due to the growth of alternative channels of distribution such as telephone banking and cash machines. An indication of this is the number of bank branches in relation to the number of inhabitants in most West European countries has declined over a long period (see figure 4 in the Appendix). Another explanation for this is that banks have been able to rationalise their branch networks by purchasing and merging with competitors.

The new sales channels increase the potential for international competition without geographical presence and allows new types of players to break into market segments where only banks have been able to dominate previously due to their access to their branch network and established customer contacts. Internet makes possible a separation between

*production and distribution of financial services.* It makes it easier for new players in the market to sell financial services produced by other participants. Producers of these services can be participants that achieve economies of scale and cost efficiency within their respective product areas. In Sweden, we see examples of specialised players that offer fund shares from different producers via internet. These companies offer their customers independent advice and provision of fund shares from a number of different asset managers. The service is cost-free and the company earns money by charging the manager a commission.

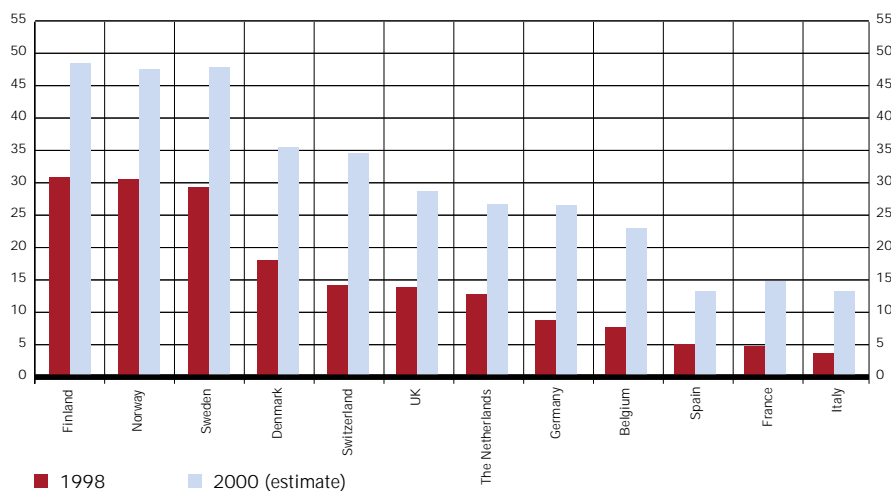
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Technical development entails both threats and opportunities for the Swedish banks. It will be easier for new players to enter the market as the internet offers a cheap channel of distribution compared with the branch networks of the traditional banks. Furthermore, independent distributors can “buy in” to economies of scale by offering other producers’ financial services. This means that the large banks can encounter an increasing spectrum of competitors in their own markets. They therefore need an increasing presence on the internet to meet the increasing competition from specialised internet-based niche companies such as stockbrokers and fund brokers.

**Figure 1:2.**  
Internet users as a proportion of population.  
Per cent



Source: Morgan Stanley Dean Winter, "The European Internet Report", June 1999.



This means that the large banks can encounter an increasing spectrum of competitors in their own markets.

At the same time, developments provide better opportunities for the banks to compete themselves in new markets. Internet can mean increased opportunities for Swedish banks to expand internationally. Some banks mention internet as a possible route to sell their services outside the Nordic market, which, together with the Baltic republics and Poland, are usually described as the home market. Arguments that have been put forward against such a development are that consumers outside the Nordic area lack knowledge about Swedish banks and that they would find it difficult to attract customers without acquiring an existing bank. There are no examples today of banks that have successfully become established in new markets without a physical presence in the form of branches. It is uncertain whether a broad spectrum of banking services and a full coverage customer concept can be successfully marketed without a physical presence or if development in the first place means an opportunity to sell individual categories of products which are particularly suited to remote sales, for instance mutual funds. It should also be pointed out that it is not until the development of internet banks that there is a real alternative to a physical presence in the form of branches.

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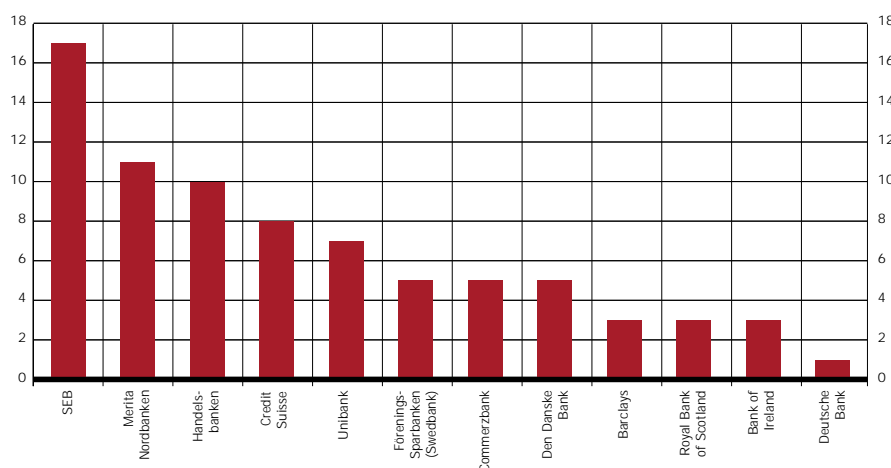
If such an expansion leads to the banks starting to increase their cross-border lending via internet to markets that they lack knowledge of, this may mean increased levels of risks in the banks' lending. The major Swedish banks' international experiences during the 1980s are evidence that this can occur. The departure from the "church tower principle"<sup>7</sup> will become large through internet. At the same time, the opportunities for good risk management for certain credits, for instance, to the household sector are improved, by the opportunities to use standardised credit assessment models.

Technical development entails a potential for rationalisations and cost savings within banking operations but also means costs for staff and offices to some extent being replaced by investments in important IT projects.

<sup>6</sup> This study was made during the first half of 1999 but it should be added that all the figures quickly become out of date due to the rapid development within this field. However, the comparison does provide an indication of how Nordic banks fare in an international comparison.

<sup>7</sup> The "church tower principle" means that all credit decisions are to be made locally. It shall be possible to see customers from the local church tower!

**Figure 1:3.**  
The proportion of internet customers of the total number of customers in the twelve European banks offering the most developed range of internet services, first quarter 1999.  
Per cent



Sources: The Banker and Lafferty Business Research.

The link between these costs and earning ability in the bank can sometimes be difficult to assess and there is a risk that incorrect investments made will have a great impact on the bank's income. The fast technical development means that it is difficult to say at present which technology will dominate in future. Investments are also dimensioned for considerably larger markets than the banks have today. For instance, it is difficult to estimate the long-term effects of the Swedish banks' considerable presence on the internet in terms of costs and revenue. It is important that the new distribution channels not only lead to additional expense but also that savings can be made in the traditional channels of distribution so that a positive net effect arises.

An increased input of technology can also entail an increase in operational risks in banking activity. Ever more sophisticated systems for production and distribution of financial services brings security risks to the fore.

The banks risk not only making losses directly in connection with operational disruptions or criminal encroachment. If, for instance, security was to be breached in an isolated case in connection with internet services, confidence in such services could be damaged in a way that would affect the entire industry.

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The new technology means a considerable challenge for the traditional banks in the form of increased competition and greater complexity.

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Altogether, development of new technology means a considerable challenge for the traditional banks in the form of increased competition and greater complexity. Major changes normally mean that the future will be difficult to appraise and that there is a greater risk of incorrect strategic decisions. The increased component of technology also makes increased demands on supervisory authorities and central banks to be able to overview and understand the changed risks in the financial system.

## The Nordic expansion of the banks

In order to meet the pressure for change, the Swedish banks have in recent years, besides investments in new technology, expanded their home markets to include the entire Nordic market. The Swedish banks are not alone in applying this strategy. A number of Nordic banks of considerable size in their home country today define the entire Nordic area as their home market. This has resulted in a number of major Nordic banks starting operations on one another's markets. From the Riksbanken's perspective, it is important to monitor this development.

As the presence of Swedish banks on foreign markets increases, the risks also alter in the Swedish financial system. For instance, the effect of the macroeconomic trends in Norway, Denmark and Finland has on the loan portfolios of the Swedish banks might increase. Furthermore, the strategic risk increases in connection with banks expanding on foreign markets where they may have a limited knowledge of local conditions. Not least the foreign investments by Swedish banks during the 1980s provide evidence of this. Major losses were made then inter alia on loans to foreign property investments. However, expansion on Nordic markets in the vicinity would seem natural against the background of the geographical closeness and the relatively large cultural and economic similarities that exist within the Nordic sphere.

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As the presence of Swedish banks on foreign markets increases, the risks also alter in the Swedish financial system.

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The expansion of the Nordic banks in the Nordic countries and the Baltic republics and Poland differs from previous investments abroad, which have been mainly intended to support Swedish customers in foreign markets. Today, the intention is to broaden activities to new geographical markets and to broaden the customer base. This often takes place by carrying out full bank activity for local private and corporate customers. Activity is thus more offensive and is a





way for the banks to meet the pressure for change that exists within banking activities. Therefore, the activities of the Swedish banks in the Nordic area are also characterised by a physical presence, both in the form of wholly and jointly owned subsidiaries and branches.

Three strategies can be distinguished among the Swedish banks; acquisition of existing banks at the location, creation of foreign alliance banks by purchasing minority holdings in existing banks, and opening of branches. The latter is usually called organic growth. Acquisition has proven to be the fastest way to enter new markets, particularly if the private market is targeted. Through acquisition, direct access is obtained to the branch network with an existing customer base and thus an immediate position in the new market. Acquisition is associated with certain risks, however. In some cases, it may be difficult for the purchaser to know exactly what he is getting, i.e. whether the existing operations are in a good condition, for instance that the portfolio does not include bad loans. Bank activity is associated with risk taking and long-term commercial connections to a large extent. Compared with the acquisition of whole banks, the creation of alliances has the advantage that the risk is lower since the capital input is less. The disadvantage is that the influence over the foreign alliance bank and its activity is limited, and it may therefore be uncertain whether the

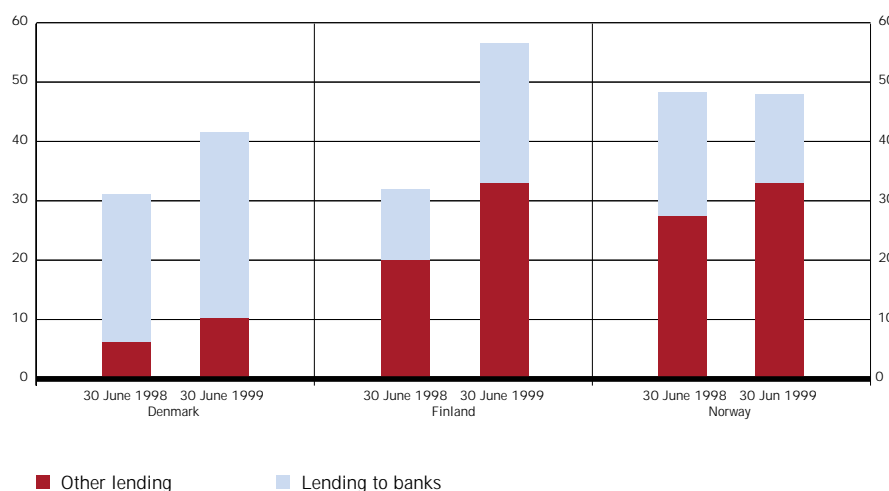
alliance really confers increased earning opportunities. Building up a branch network and achieving volumes in activities through organic growth usually takes a long time.

The four major Swedish banks' exposures to players in the other Nordic countries, Finland, Norway and Denmark, totalled SEK 217 billion<sup>8</sup> on 30 June 1999, which is over 7 per cent of the banks' total assets.

Swedish banks' total lending to the Nordic area accounts for around 7 per cent of the banks' total loans. If only lending to the "non-bank" category is included, i.e. mainly non-financial companies and households, and thus lending with a traditional credit risk, total lending to the Nordic area accounts for around 4 percent of the total lending by Swedish banks excluding lending to credit institutions (see figure 1:4). This category accounts for the major part of loans both with regard to Finland and Norway. The exception is Denmark where the major part of loans is directed towards other banks.

8 The exposures of Swedish banks in the Nordic countries and the Baltic republics, which are reported gross, consist of lending, cash in foreign currency, shares (including shares in other banks), and interest-bearing securities. Exposures that derive from MeritaNordbanken's Finnish part are not included, although the Swedish Nordbanken's ownership stake in Merita Bank is included. All claims from foreign counterparties are included, regardless of currency. Receivables from Swedish counterparties in foreign exchange are included. Receivables in relation to Swedish counterparties in SEK are not included, even though the counterparty is located abroad.

**Figure 1:4.**  
Lending by Swedish banks in  
some Nordic countries.  
SEK Billion



Source: The Riksbank.

The actual credit risk that lending to the rest of the Nordic area gives rise to is accordingly less important. A very rough estimate of the contribution to income from lending to other banks in the rest of the Nordic area shows that this activity accounts for around two to three per cent of the total income of Swedish banks. The direct impact of the Nordic activities on earning is accordingly less important, although it may increase in future.

The actual credit risk that lending to the rest of the Nordic area gives rise to is accordingly less important.

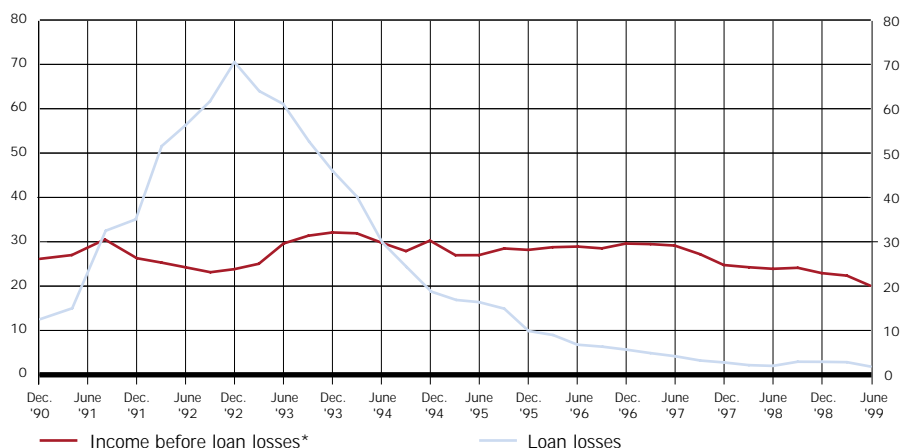
If the Finnish part of MeritaNordbanken's lending to non-financial companies and households in Finland is included, the total lending in Finland will naturally be considerably greater.<sup>9</sup> Even if this lending is by definition not Swedish, it is a potential credit risk for Swedish Nordbanken as well. The risk is great that considerable losses for MeritaNordbanken in Finland will affect Swedish Nordbanken by intra-Group exposures.

The exposures of Swedish banks in the Baltic republics and Poland are considerably less, SEK 6.5 billion on 30 June 1999, and viewed in relation to the banks' total equity they are modest—around 5 per cent. An increase has taken place, however, not least in Estonia, and indications from the Swedish banks indicate that this increase will continue (see

Figure 5 in the Appendix). As a number of Baltic banks have been and, to some extent still are, still involved in Russia, an exposure also takes place to Russia via the Baltic republics. A number of banks in the Baltic republics, of which some are jointly owned by Swedish banks, have incurred losses due to the economic crisis in Russia. The bank markets in the Baltic republics are relatively small, and it should therefore take some time before the Swedish banks' exposures there give rise to any important risks. At the same time as the bank markets in the Baltic republics are small, it is worth pointing out that a couple of Swedish banks have purchased parts, in certain cases over half, of shares in banks that are among the largest in their home markets. Swedish banks can accordingly become large in the Baltic republics in the future. As direct investments by Swedish banks in the Baltic republics are a very small part of the banks' total assets, the risk associated with ownership of Baltic banks are also to be regarded as low. However, the reputation of Swedish banks can be affected in jointly owned banks in the Baltic republics should fail.

Swedish banks' activities in Poland have increased in recent years, even though they are still in the initial phase. To date, the activity is characterised mainly by lending to other banks, while other exposure is limited. However, activities in Poland can give

**Figure 1:5.**  
Profit before loan losses and loan losses for the major bank groups, four quarters moving average. SEK Billion (1991 prices)



Note. Adjusted for non-recurring items from 1997 and onwards.  
Sources: Quarterly and annual reports and The Riksbank.



rise to certain counterparty and settlement risks, while the credit risks are limited. As the potential of the bank market in Poland is relatively great, considerably greater than in the Baltic republics, the continued expansion of Swedish banks in the country is of interest.

## The financial development of the banks

### DEVELOPMENT OF INCOME AT THE BANKS

The development of profits in the bank sector has been good in recent years, primarily due to low credit losses, although the underlying earnings have fallen (see figure 1:5). Return on the banks' equity before tax has also been satisfactory. The total return on the adjusted equity amounted in June 1999 to 14.5 per cent (see figure 1.6). This is a good return in the light of the inflation and interest rate levels that exist at present. However, it shall be borne in mind that loan losses<sup>10</sup> are at a historically low level and even made a positive contribution to income during the first half of 1999. In an international comparison of profitability for 1994 and 1998, it is evident that the return on equity in Swedish banks is relatively good (see figure 6 in the Appendix).<sup>11</sup>

The structural changes discussed in the previous section have contributed to the reduced earning. The following section contains a more direct comment on how the increase in income and costs have affected the banks' income.

The banks' main source of income is net interest income that arises primarily through the difference between loan and deposit rates. These interest rates are the banks' main prices and the difference between them is a good indicator of the level of competition in the industry. After having deteriorated for seven years, margins seems to have stabilised during the first six months of 1999. A contributory cause of this is probably the increased difference between long and short interest rates which has been observed during the first six months of 1999. As Sweden has not yet experienced a complete cycle with low inflation and low interest rates, which should characterise price stability policy, it is difficult to assess how great the liquidity premium should be which reasonably gives a difference between long and short interest rates, the interest rate difference that could be expected in the long term. It is uncer-

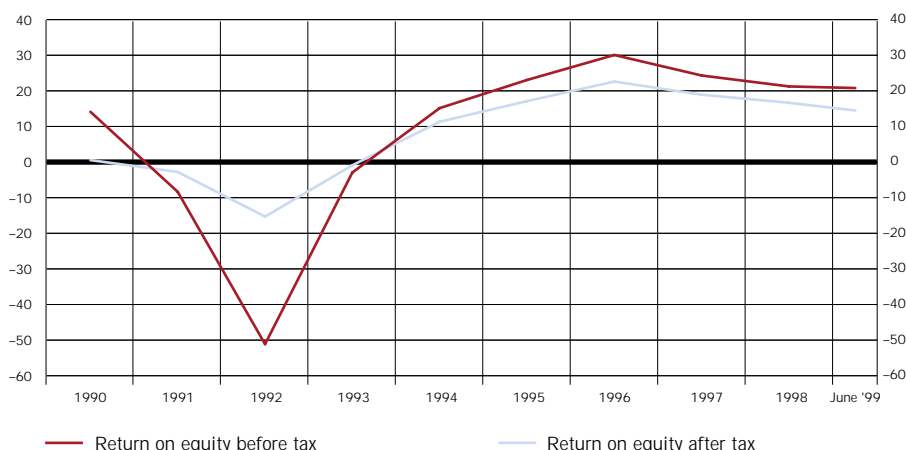
9 Merita Banks loans to the public totalled just under SEK 250 billion (28.5 billion euro) on 30 June.

10 I.e. the net of provisions and recoveries of provisions made earlier.

11 However, it should be mentioned that the considerable capital gains generated by Swedish banks in conjunction with sales of assets during 1998 have had a positive effect on the Swedish figures.

**Figure 1:6.**  
The major bank groups weighted average return on equity before and after tax.  
Per cent

Average return on equity before tax = operating profit as a proportion of the average of the opening and closing balance of equity.  
Average on equity after tax = net profit in percent of the average of the opening and closing balance of equity.



Note: Entries have been adjusted for items affecting comparability from 1997 and forwards.  
Sources: The Riksbank and quarterly and annual reports.

tain to what extent banks will be able to earn money by financing themselves with short fixed interest periods and long loans.

The revenue from net interest income has also decreased in absolute terms between 1996 and 1998. However, this reduction ceased during the first two quarters of 1999. The increased deposits during the first six months of 1999 has probably contributed to the banks' total net interest having stabilised (see figure 7 of the Appendix). This increase can also probably be connected with the fact that the margins on deposits and lending, according to the Riksbank's investigation, appear to have flattened out during the period (see figure 8 in the Appendix) at the same time as the difference between short and long interest rates, as previously mentioned, has increased (see figure 9 in the Appendix).

A comparison between Swedish and international banks' investment margins indicate that the margins in Sweden are relatively low (see figure 10 in the Appendix).<sup>12</sup> The high concentration that affects the Swedish market could lead to deficient competition, although the low investment margins indicate that this is not the case. A positive tendency is the considerable increase in the banks' net commission, partially caused by a strong development of value and volume on the stock exchange and the large net inflow to mutual fund saving.

One of the major challenges for the banks is the ability to maintain a sufficient margin in credit provision despite hard competitive pressure. The margin can be regarded as a risk premium, which must contribute to covering the possible loan losses that can arise when there is a cyclical downturn.

The price picture indicates that competition in the markets for deposits and loans has increased during the greater part of the 1990s. The large banks in Sweden are still very dominant. However, the large banks are losing market shares at the expense especially of small and foreign banks. The large banks have, for instance, lost almost 10 per cent of the market for deposits from households mainly to foreign and small banks since 1992 (see figure 11 in the Appendix). Also on the lending side, the large banks have lost market shares during the major part of the 1990s. This trend continued during the first half of

1999 and since 1992, the large banks have lost around 12 per cent of the market for corporate and private bank loans (see figure 12 in the Appendix). This trend has probably contributed to the banks increasing investment in broadening their product range, expanding their geographical markets and trying to make activities more efficient by consolidation and investment in new technology.

The level of costs in the Swedish bank system has increased in recent years, primarily due to increased investment in IT (see figure 13 in the Appendix) and increasing merger costs caused by the extensive consolidation that has taken place. The Nordic and Baltic expansion and offensive investments in, for instance, capital management have contributed this development. Costs in relation to income (the C/I ratio)<sup>13</sup> rose considerably during the first half of 1999, which is in line with the development that has taken place since 1993 (see figure 14 in the Appendix). Many analysts consider, however, that the cost increases which can be related to newer and more efficient technology, will lead to a more positive development of costs in future. Moreover, positive effects of mergers and acquisitions can be expected to break through in a better development of costs in future.

The development of costs of the Swedish banks, measured as the C/I ratio has been compared with a selection of international banks (see figure 15 in the Appendix). It is evident that Swedish banks according to this measure are still in a relatively good position. The Swedish banks are ahead of the majority of international players with regard to investments in, for instance, internet-based activity. These investments have contributed to pushing up costs in the Swedish banks during recent years in a way perhaps not corresponded in foreign banks. It is possible that this can lead to an increase of the development of costs in international banks in future, viewed in relation to the Swedish banks.

The development of the banks' loan portfolios is at present very positive (see figure 6 in the Appendix) which can be attributed to the favourable economic development. See Chapter 2 for a more forward looking appraisal of the credit quality trend in the Swedish banks.



The profitability in the Swedish banks for a time has been squeezed as a result of the pressure for change that exists in the industry. However, profitability is good at present.

Altogether, it can be said that profitability in the Swedish banks for a time has been squeezed as a result of the pressure for change that exists in the industry. However, profitability is good at present and there are signs that indicate an improvement in future. Furthermore, the banks' capital adequacy situation would seem to be satisfactory in relation to risk taking.

#### THE BANKS FINANCING SITUATION

Changes in household saving behaviour, with a larger portion of capital in savings forms outside the banks' balance sheets, has consequences for the banks' financing (see figure 1 in the Appendix). The banks must find new, supplementary sources of finance. Examples of such financing forms are borrowing from Swedish and foreign banks and borrowing on the capital markets. A problem with this development is that experiences indicate that deposits during times of financial turbulence is a relatively stable form of financing while, for instance, credits from foreign banks tend to be withdrawn fairly quickly. Since a number of financial crises dur-

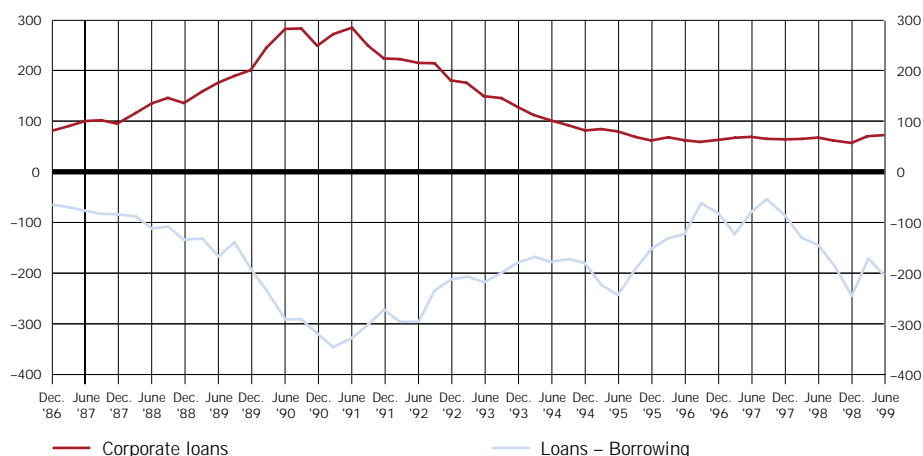
ing the past decade have been characterised by foreign interbank financing suddenly being withdrawn, it is important to analyse in more detail their importance for the banks' liquidity situation. During the bank crisis, Swedish banks had problems in financing their assets in foreign currency in conjunction with the crisis in confidence that affected the Swedish bank system. This created serious problems as a considerable portion of the banks' loans to non-financial companies was in foreign currency. As a consequence of this, the Riksbank had to assist the Swedish banking system with credits in foreign currency.

Financing problems risk arising in the first place if the banks need foreign loans to provide non-liquid loans in foreign currency. A crisis of confidence that affects the banks' foreign financing cannot then be met by realising the loans, due to their illiquid character. However, if the foreign loans are used for financing of liquid assets, the bank is not exposed to liquidity problems in the same way as the liquid assets can be realised if financing falls off. One way of measuring the vulnerability of foreign financing is

12 The investment margin is defined as the share of net interest income of interest-bearing assets. The reason for including all interest-bearing assets in this measure is that the interest-bearing assets generate income which is included in net interest income.

13 Expenses before loan losses adjusted for items affecting comparability as a proportion of income.

**Figure 1:7.**  
Loans to non-financial companies in foreign currency from banks and the difference between loans to and borrowing from foreign banks.  
SEK Billion



Source: The Riksbank.

to place the banks' loans in foreign currency on the interbank market in relation to the banks' loans to non-financial companies (see figure 1:7). The large net loans around 1990 were corresponded to to a very great extent by loans to companies in foreign currency, which is the explanation for the occurrence of a liquidity crisis. In recent years, net loans have increased relatively greatly, while FX corporate loans are at a considerable lower level than at the beginning of the 1990s, so that increased loans should not entail an increased liquidity risk at the banks. The banks are not exposed to a sharp reduction in foreign interbank finance in the same way as at the beginning of the 1990s.

#### INCREASED BANK FINANCING OF MORTGAGE INSTITUTIONS

The decline in interest in recent years has entailed that an increasing part of the mortgage institutions' new loans take place with variable interest rate (see figure 2:8, p. 30). In 1996, 17 per cent of new loans were at variable interest rates, while the corresponding figure for September 1999 was 66 per cent. This can be explained by the willingness of lenders to benefit from falling interest rates at the same time as the difference between the long and short rates increased, which mean that many opt to remain with variable interest rate. These changes mean that the

stock of loans has changed (see figure 23 in the Appendix) and thus the mortgage institutions' financing requirements.

During the past years with increased loans at variable interest rate, the issues of mortgage certificates have decreased. Instead, the banks have to an increasing extent, come to finance mortgage institutions. Often the parent company finances their own mortgage institutions by purchasing certificates and bonds, and by providing loans (see figure 20 in the Appendix). This development has been very marked during the past two years (see figure 1:8). The group internal liabilities in all mortgage institutions, i.e. mainly financing from the parent bank, constituted between 25 and 30 per cent of the total loans and securities financing of the mortgage institutions total loans and securitisation.

One consequence of this is that the dependency between the parent bank and the mortgage institution will become stronger. The idea with separate mortgage institutions has been to avoid the banks giving long-term loans, financed by deposits. By building up mortgage institutions that finance themselves by market issues, housing financing could function even if the bank sector encountered problems. The "watertight barriers" which previously existed between the banks and their mortgage institutions have disappeared in recent years. The risk

**Figure 1:8.**  
Loans from the four major banks to the mortgage institutions.  
SEK Billion



Source: The Riksbank.

for the spreading of problems between banks and mortgage institutions has therefore increased, and entails that lenders to banks and other interested parties need to see the groups as a whole and not as separate institutions.

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The risk for the spreading of problems between banks and mortgage institutions has therefore increased.

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In the event that large quantities of loans are changed/re-negotiated from variable to fixed rates of interest, the mortgage institutions will need long term financing. This is not something that they can obtain from the banks to any great extent. Instead, they have to increase their bond loans. The outstanding stock of housing bonds on 30 June 1999 was almost SEK 600 billion. During the assumption that the variable part and a third of the loans at fixed interest shorter than 5 years<sup>14</sup> were to be converted to a lower fixed interest rate, this means that an additional approximately SEK 300 billion would need to be financed via the bond market, thus an increase by 50 per cent. In a market situation with expectations of rising long interest rates over a period, it is not altogether sure that there will be sufficient liquidity to swallow these amounts in a short period.

Instead the mortgage institutions can be obliged to issue bonds which are purchased by the parent bank alternatively to continue to provide short term financing which the mortgage institutions swap for a long interest rate. However, it is not certain that the swap market is sufficiently liquid to handle these volumes at reasonable price levels. The exposure of the mortgage institutions in such a situation to the parent bank's borrowing means in principle that they would also in a more or less direct way be affected by financing problems in the parent bank. In conjunction with the bank crisis at the beginning of the

1990s, it was in most cases the mortgage institutions that were able to borrow in the market and in this way assist in financing the parent bank.

Regardless of the form of financing from the parent bank, there is a refinancing risk for the bank groups. To some extent, the housing institutions can meet any increased financing costs by simply shifting over the costs to the customer. This should not be any considerable problem on the household market as it is above all a domestic market. It may be more difficult in the corporate market taking into consideration international competition. However, it is not a risk that should be overestimated. In a situation where many wish to fix their interest rates, the long rates offered to borrowers will increase due to the market mechanisms described here. The increasing interest rates will in turn have a restraining effect on the willingness to bind interest rates and the development of events will as a consequence be counteracted. Financing can probably be solved without any great problems, although it is nevertheless important to note that a change in behaviour has taken place. In the recent period, the volatility has increased on the swap and housing bond markets. Higher volatility and high spreads on these markets means higher funding costs for the mortgage institutions (see figure 19 in the Appendix). This is probably a consequence of the millennium transition and is an aggravating circumstance which is, however, transitory. To sum up, there is very little to indicate that the market mechanisms that act in the housing loan market should not be able to deal with the movements that may occur.

14 If the loan stock in the mortgage institutions is examined more closely, it is evident that a considerable portion of the loans with fixed interest rate shorter than five years were taken out between 1996 and 1997 (see figure 18 in the Appendix).

# Macroeconomic trends and credit risks at the banks

*In the present situation the risk for loan losses is small since Sweden is in a cyclical upswing. Lending to households and corporate loans have increased since the previous report. Low nominal interest rates and increasing asset prices combined with the increasingly strong state of the economy, contribute to this trend. The ability to pay and solvency of the household and corporate sectors are generally good although vulnerability to higher interest rates is increasing*

The credit risk in the banks' loan portfolios is linked to the macroeconomic development as loan losses tend to be correlated with business cycles. In an upswing, loan losses are usually low and the opposite in a downturn. This is natural since a downturn means reduced demand, which means that businesses will find it difficult to sell their products, which will in turn lead to reduced profitability and eventually perhaps an increasing number of bankruptcies and consequent loan losses. For the household sector, a cyclical downturn entails increased unemployment and poorer income which can lead to payment problems. Even if household lending is large, loans to this sector entail less risk than corporate loans. Households cannot become bankrupt in the same way as businesses and are therefore less willing to take risks.<sup>15</sup> High indebtedness in the economy could mean that sudden macroeconomic changes contribute to system-threatening bank problems, as was the case in Sweden at the beginning of the 1990s.

In a cyclical upturn, the risk for major loan losses is small and analysis should then be focused on investigating whether there is a build-up of risk and financial imbalance, for instance, in the form of speculative bubbles. If this is the case, it can mean an increased vulnerability for households and businesses when there is a cyclical downturn.

The prospects for growth in the Swedish eco-

nomy have markedly improved since the previous report.<sup>16</sup> Figures for the second quarter of 1999 show that GDP increased by 3.2 per cent on an annual basis. Employment has continued to increase since the year-end. Public finances have improved and a surplus was achieved in 1998 for the first time since the crisis in the early 1990s. Asset prices have risen but lending in relation to GDP has declined slightly (which is primarily explained by the strong growth figures) which means that the same speculation-driven imbalances in loans cannot be seen as at the end of the 1980s (see figure 2:1). This positive development combined with similar positive forecasts is reflected both in household and corporate expectations which in the present situation are optimistic about the future. Altogether, most indicators point to a positive picture of future economic development.

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Altogether, most indicators point to a positive picture of future economic development.

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The chapter begins with an account of the developments in the corporate sector and thereafter a section on the household sector. A large part of bank loans go to the corporate sector of which real estate companies in turn make up a considerable portion. The property sector is analysed therefore separately in the last part of the chapter.



## The corporate sector

A large part of the loan losses which affected the banks during the bank crisis at the beginning of the 1990s derived from the corporate sector that was hard hit by the downturn with suspensions of payments and bankruptcies as a consequence.

The Riksbank follows the development in the corporate sector to detect signs at an early stage of the build-up of risk that could lead to payment difficulties and therefore cause problems for the bank sector. Initially, the trends in *corporate loans* from banks and mortgage institutions are analysed, the reason for this being that increased lending can entail increased risk-taking for the banks. After this, there follows a review of *bankruptcy risks* and *solvency* in the corporate sector. The risk for bankruptcies (and thus loan losses) is analysed both from a macro- and a microeconomic point of view, and from a market perspective where market expectations are used indicate off the risk for suspensions of payments.

### CORPORATE LOANS

*Lending* should not in the long term grow more quickly than the economy as a whole as this means an increasing debt burden for the borrowers, which may be difficult to bear in a downturn. By looking at

loans in relation to some growth measures, for instance, GDP, an indication can be obtained of whether imbalances are being built up. The dominating part of the lending to the corporate sector comes from banks and mortgage institutions. Lending to businesses from banks increased in August 1999 by 10.6 per cent<sup>17</sup> on an annual basis. There are no official statistics that show the purpose for which bank loans are granted, but some guidance can be obtained by studying the collateral provided for the loans. Bank loans for mortgages in property have increased by five per cent since the previous report (see figure 24 in the Appendix).

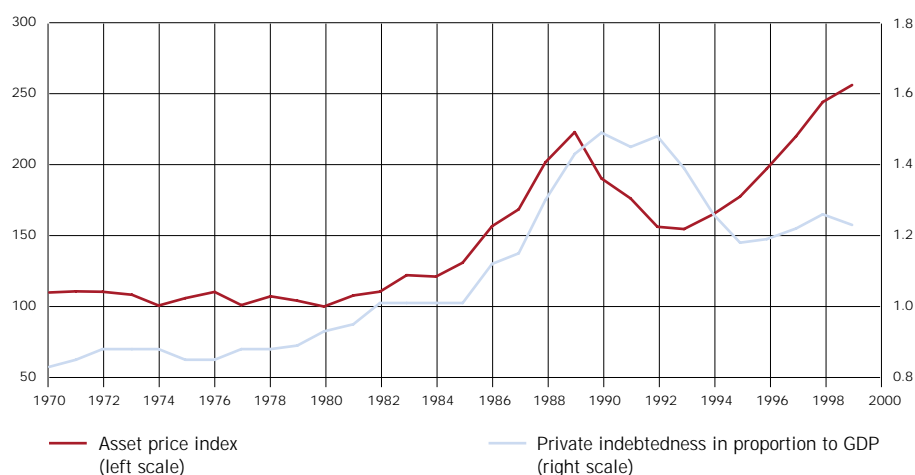
Loans from *mortgage institutions* to businesses had fallen by over 6 per cent in August. The reduced corporate loans from mortgage institutions can to some extent be explained by reduced loans to apartment blocks. Net lending to apartment blocks had fallen by over 6 per cent on an annual basis in August 1999. A contributory cause of this is probably that real estate companies to an increasing extent place loans at banks to obtain shorter fixed interest periods

15 When a limited company is declared bankrupt, it ceases to exist and the owners lose only their share capital, while a private person's debts do not disappear in a personal bankruptcy.

16 Financial Stability Report 1999:1.

17 Refers to lending excluding repos.

**Figure 2:1.**  
Loans and real asset prices.  
Index: 1980=100 and  
proportion of GDP



Note: Indebtedness means loans to Swedish general public (households, businesses and municipalities) in relation to GDP. The asset price index is a weighted average of share prices, house prices, and prices of commercial properties. Data for 1997 and earlier compiled by the BIS. Later data are based on Riksbank calculations.

Sources: BIS and the Riksbank.

and thus lower interest expenses. Another reason may be that amortisations have increased due to the lower nominal interest rates.

Altogether, the growth of loans in the corporate sector does not appear disturbingly high. The strong growth in the Swedish economy in the recent period entails a natural increase in lending.

Total corporate lending (from banks and mortgage institutions) has increased by 2.3 per cent on an annual basis, but has declined slightly in relation to GDP (see figure 2:2). Altogether, the growth of loans in the corporate sector does not appear disturbingly high. The strong growth in the Swedish economy in the recent period entails a natural increase in lending, which is also necessary for investments, and from this perspective lending seems to be balanced at present.

#### BANKRUPTCY RISKS IN THE CORPORATE SECTOR

Bankruptcies in the corporate sector usually lead to problems for the banks as they cause loan losses. In a historical perspective, the two variables have correlated well (see figure 25 in the Appendix).

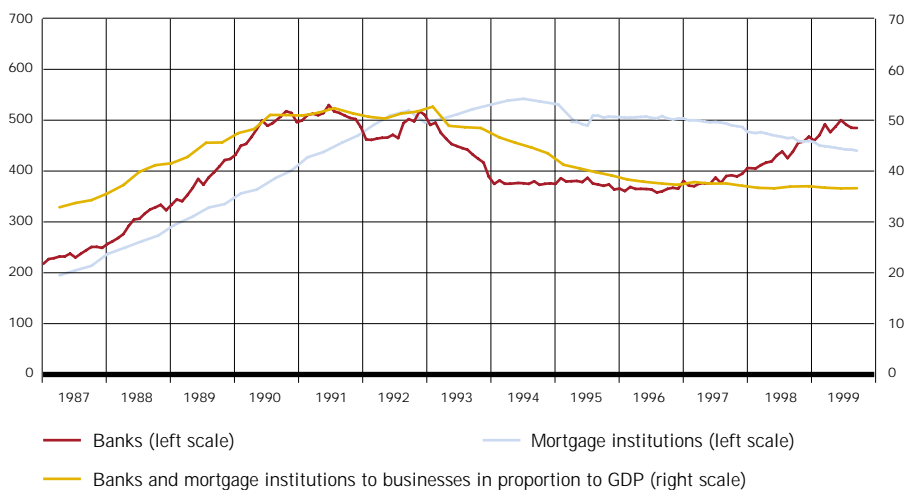
Recent developments show that the bankruptcy

rate continues to fall, which also applies to loan losses. In August 1999, the number of bankruptcies fell by 24 per cent compared with the same period in 1998. The favourable development in the Swedish economy indicates continued low bankruptcy rates in the next few years.

At present, most indicators point to continued low bankruptcy rates.

The *macroeconomic developments* are very important for how bankruptcies/loan losses develop. By monitoring and making forecasts on the basis of various indicators mentioned in the panel below, a picture can be obtained of the expected future development of bankruptcies. Figure 2:3 shows bankruptcy forecasts over a two-year period on the basis of the various indicators. As shown in the figure, the majority of indicators in the present situation point to a continued low bankruptcy rate. The only deviating variable is corporate loans. As loans are continually increasing, this indicates a future increase in bankruptcies. However, the increase in loans in relation to GDP is relatively small. This indicates that the volume of loans is not disturbing taking into consideration the present strong development of the Swedish economy.

**Figure 2:2.**  
The banks' and mortgage institutions' respective lending to businesses and total lending as a proportion of GDP. SEK Billion and per cent



Note. Statistics Sweden has changed the computation of GDP, the new method of computation has been used from 1993.  
Sources: Statistics Sweden and the Riksbank.





## BANKRUPTCY FORECASTS WITH THE AID OF MACROECONOMIC INDICATORS

In a study by the Riksbank,<sup>18</sup> the correlation between the trend for bankruptcies and the macroeconomy has been examined more closely. Different macroeconomic variables have been tested to explain the bankruptcy trend. Indicator studies show that corporate expectations (as measured, for instance, by the National Institute of Economic Research's confidence indicator), correlate with the future development of bankruptcies. Corporate loans have also proven to have a positive correlation with bankruptcies. Increased lending has sooner or later led to an increase in bankruptcies. Historically, inflation has also, measured as CPI, co-varied with the number of bankruptcies. This correlation will probably not be as strong in future since the monetary policy

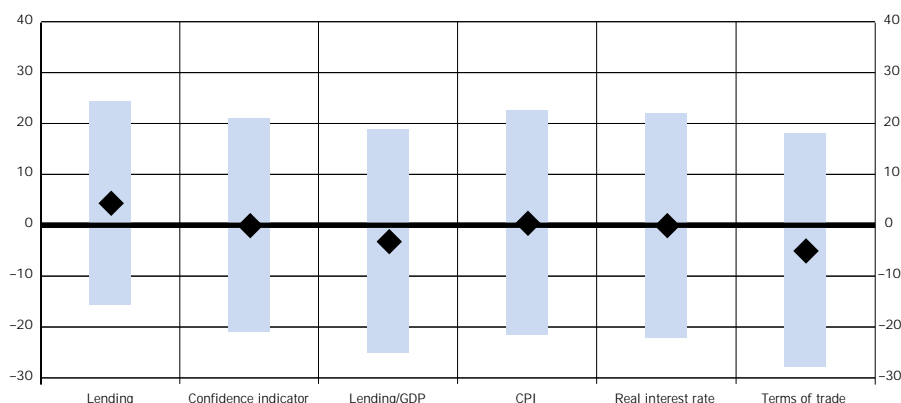
objective is to keep inflation down to two per cent, which means that future inflation can be expected to be low and relatively stable. In the longer term, the relation of export prices to import prices ("terms of trade") has proven to be a good indicator of the number of bankruptcies. An increased demand from abroad is good for Swedish businesses and normally entails a reduced number of bankruptcies. As expected, the interest rate has a positive effect on the bankruptcy rate; an increasing interest rate implies that it is becoming more expensive for businesses to pay their loans and can therefore lead to payment difficulties.

18 See coming article in Quarterly Review.

In order to obtain an idea of how solvency develops at the level of the individual enterprise (i.e. in a *micro-economic* perspective), the Riksbank also monitors the development of businesses' interest coverage ratio and debt-equity ratio.<sup>19</sup> The debt-equity ratio continues to fall, the median value for 1998 was 1.4 (see figure 2:4). This means that businesses have reduced their debt-equity ratio, which can to some extent be

19 The debt-equity ratio is the enterprises' liabilities in relation to equity. The interest coverage ratio is the enterprises' operating surplus plus financial revenues divided by interest expense. A high value for the interest coverage ratio shows that the businesses' operating surplus suffices to cover the financing expense, a value under 1 indicates that the operating surplus is insufficient to pay the interest expense. Only the trend for large companies is discussed here. However, it has been seen to correlate with the corresponding indicators for small enterprises, see Financial Market Report 1998:1.

**Figure 2:3.**  
Forecasts of the future bankruptcies (two-year perspective).  
Per cent



Note. Indicators are ranked according to forecast ability (forecast capacity is measured with Root Mean Squared Error (RMSE) i.e. the average forecast error.) The point estimate is surrounded by uncertainty intervals which is indicated by a blue column around the dot estimates based on the historical forecast bankruptcies (i.e. the smaller the blue column, the better the variable has been in forecasting future bankruptcies).

Source: The Riksbank.

described by low interest rates and high profitability making it possible to amortise to a greater extent. The interest coverage ratio has continued to increase and the outcome for 1998 was 6.3 which indicates that the businesses have improved their capacity to control increasing interest expenses.

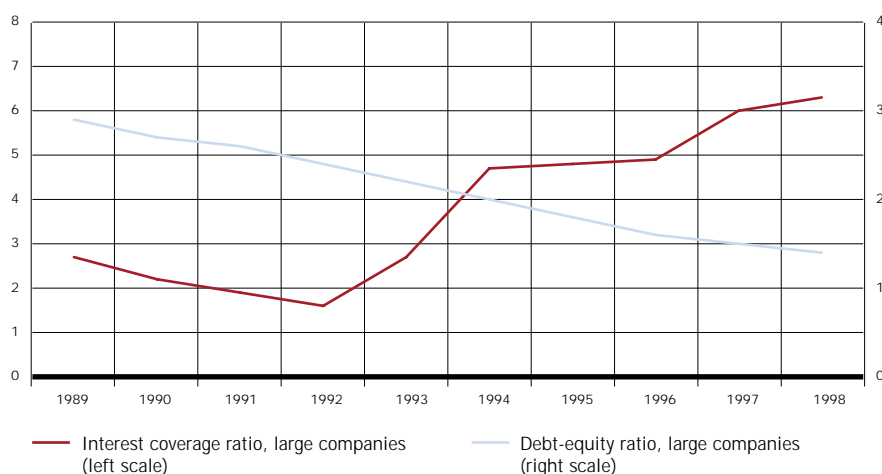
A further indicator of the state of the corporate sector is provided by the risk classification of businesses made by Business & Credit Information Agency (UC). On the basis of different variables with a capacity to forecast the risks of bankruptcy, companies are placed in one of five risk classes, where 1 contains the companies with the highest risk (which, according to UC's forecast have over 25% probability of becoming insolvent within 2 years). Class 5 contains the businesses with the least risk (with at most 1 per cent probability of becoming insolvent within 2 years).<sup>20</sup> What is interesting with this classification is perhaps not the levels as such but rather how the number of businesses has varied over time between the different risk categories. Statistics exist today with accounting information up to and including 1998.<sup>21</sup> During 1998, the proportion of businesses in the highest two risk classes increased slightly compared with 1997 and is at 7.2 per cent. The proportion of businesses in the risk classes with the lowest risk (class 4 and 5) has *fallen* slightly but is

still very high; 71 per cent of businesses belong to these classes compared with 75 per cent in 1997 (see figure 26 in the Appendix).

If the trend towards an increasing number of businesses in high-risk categories and a reduction in the low risk categories continues, it is an indication of higher risk in the corporate sector. However, it should be borne in mind that the risk level is historically very low and that it is too early in the present situation to talk about a trend reversal.

*Market information* can also provide indications of a company's credit risk. This is something which has begun to be used recently in so-called credit risk models to conduct a risk assessment of credit portfolios. KMV Corporation has developed a model in which information from market prices for company shares is used for calculations of probability of bankruptcy, EDF (Expected Default Frequency), at both individual enterprise level and industry level. The Riksbank has studied the model results for different sectors of Swedish and foreign markets. Comparing the EDF for non-financial listed businesses in Sweden and some European countries, it is evident that Swedish companies since 1995 have reduced their risk level in relation to comparison countries (see figure 2:5). Swedish companies have displayed a decreasing trend since the middle of 1998, while the

**Figure 2:4.**  
Interest coverage ratio and debt-equity ratio for large companies.  
Quotas



Source: Business & Credit Information Agency (UC).



turbulence in autumn 1998 was reflected in an increase in every country's EDF. The levels have been maintained since then, which is somewhat remarkable taking into consideration the favourable economic development that followed during 1999. EDF for real estate companies is shown in the section on the property sector.

To summarise, lending to the corporate sector has increased but bearing in mind that the Swedish economy at present is developing strongly, lending does not indicate that any imbalances are in the process of being built up. The macroeconomic situation is favourable and stable from a business point of view. The reduced debt-equity ratio and increased interest coverage ratio shows that the financial situation at corporate level has continued to improve and the other indicators that the Riksbank monitors are not indicating that the development in the corporate sector is negative from a stability perspective. This is also confirmed by the banks' loan losses continuing to fall and now being at a historically low level. The conclusion from the previous report, that businesses are in a position to meet a deterioration of the macroeconomic development without subsequent to extensive suspension of payments and thus problems for the bank sector, therefore remains.

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Businesses are in a position to meet a deterioration of the macroeconomic development without subsequent to extensive suspension of payments and thus problems for the bank sector.

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## The household sector

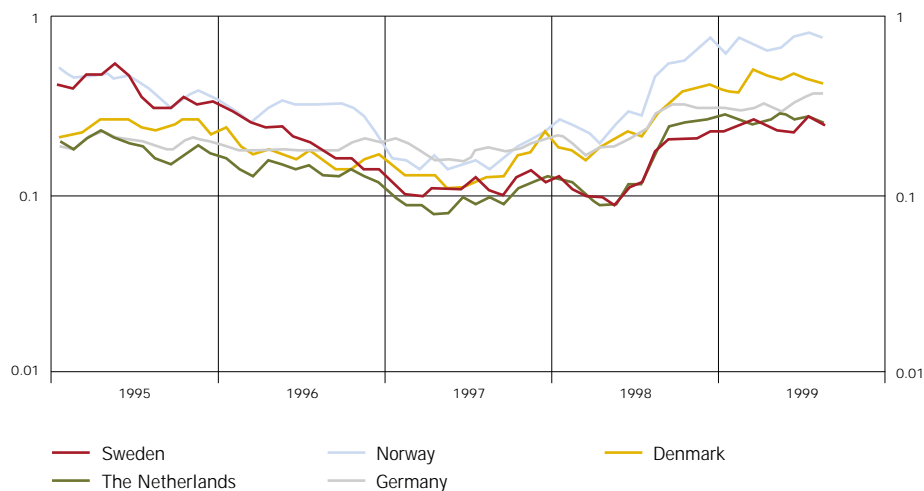
### LENDING TO HOUSEHOLDS

A high growth in lending to households can in the same way as for the corporate sector entail a build-up of risk at the banks. The aggregate lending to the household sector increased in August 1999 by 7.7 per cent compared with the same period in 1998 (see figure 2:6). This increase is evenly distributed between the banks and the mortgage institutions, with a slight predominance for the latter. The distribution of household loans between banks and mortgage institutions has been relatively constant since the mid-1990s.

20 See Financial Stability Report 1999:1 for a more detailed review of the different risk classes and methods.

21 The information for 1998 included in the previous report was preliminary and has been revised slightly in this report.

**Figure 2:5.**  
EDF for non-financial listed companies.  
Per cent (logarithmic scale)



Source: KVM Corporation.

Lending in relation to GDP has increased slightly, 3.8 per cent on an annual basis. Lending to households refers largely to housing finance. Lending for *houses* (single-family dwellings) in mortgage institutions had increased in August 1999 by around 8 per cent compared with the same period in 1998. This increase is probably due to a large extent to existing dwellings being sold or mortgaged at a higher value than previously due to increased house prices. An indication of this is that the growth in lending for houses coincides relatively well with the rate of change of house prices (see figure 2:7).

During the first six months of 1999, lending for tenant-owned apartments increased by around 17 per cent. The strong increase in loans to tenant owned apartments probably also depends on increased sales and higher loan values of existing tenant owner apartments due to a strong increase in prices.

Lending to tenant-owner apartments made up only over 7 per cent of the total volume of lending and can therefore only explain a smaller part of the total growth in lending to households.

The increased lending to the household sector has a number of explanations in addition to house price movements:

*The low (nominal) interest rate level means that the*

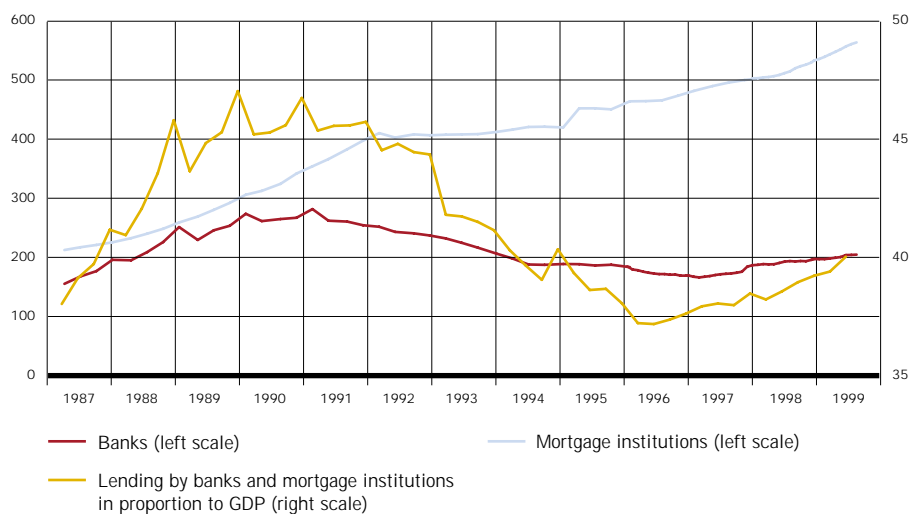
proportion of income of interest expenses has declined. At the same time, this contributes to some extent to driving up the price of housing which represents a large portion of households' borrowing requirements. However, it should be remembered that the real interest rates in the present situation are high (see below).

*Household optimism* regarding their own finances has increased, which means that they dare to incur debts to a greater extent. According to Statistics Sweden's confidence indicator<sup>22</sup> for September, 23 per cent more of the surveyed thought that the economic situation would improve than those who thought it would deteriorate. This is a historically high level.

After the cyclical downturn in the early 1990s with low consumption and high saving, households can see a brighter period ahead and dare consume again. There is probably a pent-up consumption need. Private consumption is at present developing very strongly and is expected to continue to remain at high levels for the next few years.

Even though lending to households is increasing in the present situation, the same rate of increase is not registered as was seen at the end of the 1980s. The increased lending then referred to a pent-up borrowing need after many years' of regulated credit markets and on favourable tax deduction rules for

**Figure 2:6.**  
Lending to households by banks and mortgage institutions and aggregate lending in relation to GDP. SEK Billion and per cent



Note. Statistics Sweden has changed the computation of GDP, the new method of computation is used from and including 1993.  
Sources: Statistics Sweden and the Riksbank.

interest expenses. High inflation also contributed to a quick “amortisation” of the loans. Taking into consideration the tax effects the actual real rate of interest was often even negative (see figure 27 in the Appendix).

In the economic environment of the 1980s with expansive fiscal policy and a monetary policy focused on maintaining the fixed exchange rate, asset prices and the granting of credit were driven to a speculative bubble. When policy changed direction to low inflation in 1991 at the same time as the tax reform reduced the opportunities for deductions for interest payments, the real rate of interest rose sharply which in turn led to the asset prices falling (see figure 2:1). In the present situation, the economic environment appears different. The adaptation processes after foreign exchange and credit market deregulation and after the tax reform are largely completed. The low inflation regime is established and we have moved from a fixed exchange rate policy to inflation targets. Both monetary policy and fiscal policy are focused on stability. The new low inflation environment means that the real rate of interest is positive which means that the loan is no longer “amortised” by inflation. It is therefore not probable that the real interest rate shock of the kind that affected households and businesses at the beginning of the 1990s

could be repeated with the same force today.

However, there is a risk that rising *nominal* interest rates would affect the household sector relatively hard. At present, an increasing number of households have decided to have loans with variable interest (see figure 2:8), which means that increasing nominal rates would rapidly have an impact in the form of increasing interest expenses. This together with increased indebtedness means that households to a greater extent than before are exposed to changes in the nominal rate of interest.

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Households are to a greater extent than before exposed to changes in the nominal interest rate.

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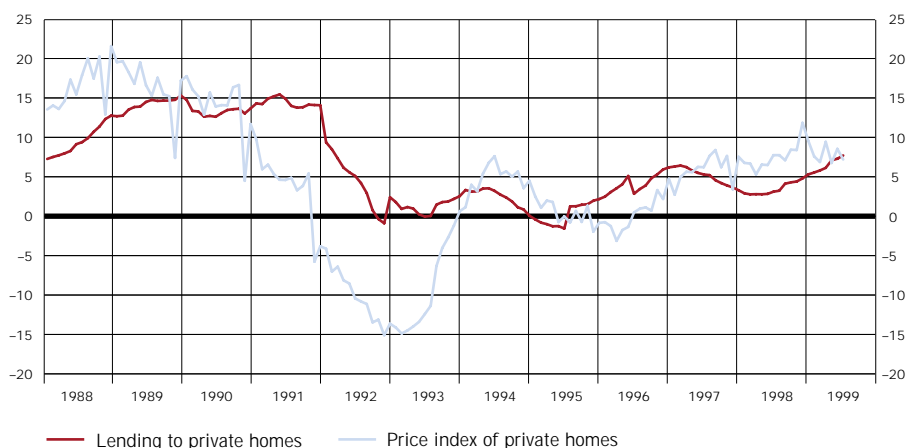
#### HOUSEHOLDS ABILITY TO PAY

If the increasing lending entails problems or not depends naturally on the situation with regard to households’ ability to pay.

Household real income has developed relatively weakly during recent years, but started to rise last year and is expected to increase further in future, mainly as a result of a more expansive fiscal policy

22 The confidence indicator is the average value of the net figures (those who believe things are going to improve minus those who believe that things will get worse), for how people think that their own financial situation and the Swedish economy will develop.

**Figure 2:7.**  
Changes in house prices and lending to houses from mortgage institutions.  
Per cent



Sources: Statistics Sweden and the Riksbank.

and an improved situation on the labour market. Looking at household debts as a proportion of *disposable income*, this has increased in recent years (see figure 2:9). An explanation for this development may be that households to an increasing extent rely on *financial assets* that have developed very strongly in recent years. During the first six months of 1999, the value of the financial assets increased by around SEK 200 billion (during the corresponding period in 1998, the financial assets increased by SEK 65 billion). SEK 22 billion of this increase was new saving. The strong increase in value is primarily explained by rising share prices.<sup>23</sup> After turbulence on the financial markets in autumn 1998, the stock exchange has recovered and share prices are today at the same level as before the collapse in 1998. The strong increase in asset prices means that household liabilities in relation to the financial assets are falling and are far from the levels achieved in the 1980s. Although the debt to income ratio has increased in recent years, it should be emphasised that the level is far from the level at the end of the 1980s.

To sum up the increased indebtedness in the household sector entails a risk for payment problems in a downturn. The household sector is vulnerable to large increases in nominal interest rates, although the risk of this happening is small with a floating

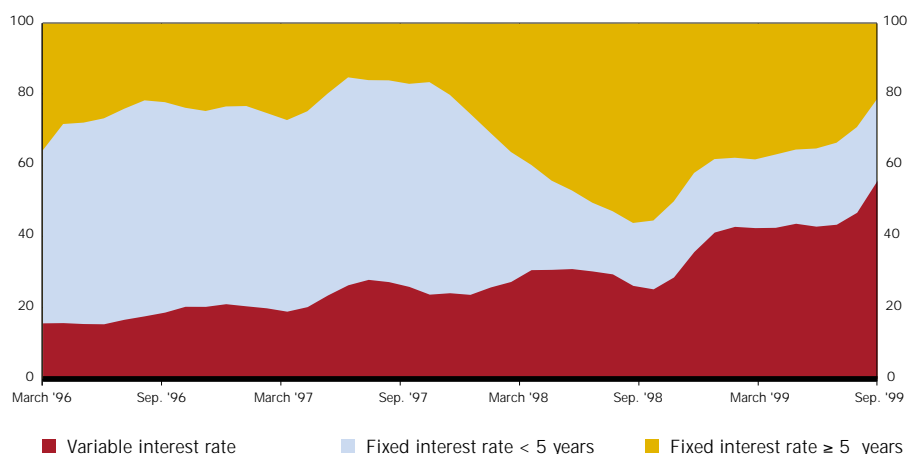
exchange rate and monetary policy governed by an inflation target.

## The property sector

Loans to the property sector make up a large part of banks' corporate loans. The relatively large exposure to the property sector means that the development of profitability in this industry has a great impact on the banks' credit risks and income. Property mortgages furthermore make up the most important of collateral on the credit market and it is important to follow how the value of collateral develops.

Financial crises have often been preceded by rising asset prices which have been clearly excessive in relation to the expected net cash flows of the assets. Before the bank crisis affected Sweden at the beginning of the 1990s, property prices increased considerably more than what was motivated on the basis of the income that the properties generated ("net operating income", i.e. rental income minus operating expense). Instead, price increases were driven by speculative expectations that prices would continue to rise. In these cases, one usually talks in terms of "price bubbles" being created in the economy. To

**Figure 2:8.**  
Households' fixed interest periods for new loans in mortgage institutions, three months moving average value.  
Percentage distribution



Source: The Riksbank.



identify tendencies to such price bubbles in the property sector, the Riksbank monitors the development of direct yield, i.e. net operating income in relation to the property price.

Price bubbles have often been reinforced by fast increase in loans. This was also the case in the Swedish bank crisis. The price trend in the property market need therefore be put in relation to lending that finances property investments.

In the following section, price trends on the property market are discussed, then direct yield and finally solvency in the property sector.

#### PRICE TRENDS

The most noticeable price trend in the property market can be noted for housing in big city regions. Prices of apartment blocks<sup>24</sup> in big cities increased by as much as 22 per cent during the first half of 1999 alone. If this rate of increase is sustained, it will exceed by a broad margin, even the past two years' strong price increases, which have been around 20 per cent annually. The largest price increases on apartment blocks are to be found in the Stockholm area. This trend is due to the combined effect of a number of factors. Economic growth has been relatively stronger in the big city regions than in other parts of the country, which has led to an a

migratory pressure in the big cities. And the historically low nominal interest rates have contributed to increased demand for housing. The supply side is characterised still by few vacant housing units and a low level of new construction.

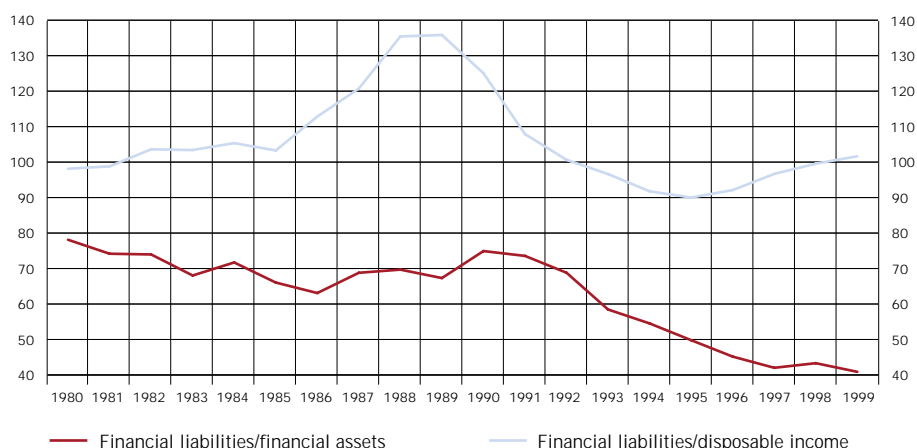
A contributory reason to the price increase for apartment blocks is probably the transformation of rented properties to tenant-owned properties. These conversions have increased in the Stockholm inner city from almost 40 per cent of the number of purchases at the beginning of 1998 to around 70 per cent at the beginning of 1999.<sup>25</sup> Normally, a tenant-owners' association values properties at between 15 and 20 per cent higher than a property owner who lets apartments. Moreover, the conversion to tenant owner apartments contributes to an increase in the turnover of rented accommodation, which also pushes up prices. It may also be the case that the

23 Shares currently make up around 40 per cent of households' financial savings. Other major components are: bank deposits, bonds and insurance saving (as insurance saving to some extent consists of shares, the "share item" is actually rather higher than forty per cent. See also figure 1 in the Appendix.

24 When mentioning apartment blocks, this refers to rented properties only and not to properties owned by tenant-owner associations.

25 Applies to acquisition of housing properties in the Stockholm inner city during the period 1 October 1997 to 1 March 1999. Source: Catella Fastighets-ekonomi AB. The price trend for premises and housing properties in Stockholm during 1998, May 1999.

**Figure 2:9.**  
Household liabilities in relation to disposable income and assets.  
Per cent



Sources: Statistics Sweden and the Riksbank.



considerable difference that exists between the value of the properties as a rented property and tenant-owned property pushes up prices generally as expectation of future conversions can exist also when properties are sold as rented properties. Similarly, expectations of a loosening of rent control system.

Housing production is increasing in Sweden today, although this increase starts from a very low level and the increase in absolute terms is low. The picture of a housing shortage and increased prices for housing properties in big city regions is in sharp contrast to the situation in many rural regions where continued major vacancies exist as a result of migration. In some places, houses are being demolished due to an continually high vacancy level.

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The large price increases on rented apartments in big cities are a warning signal.

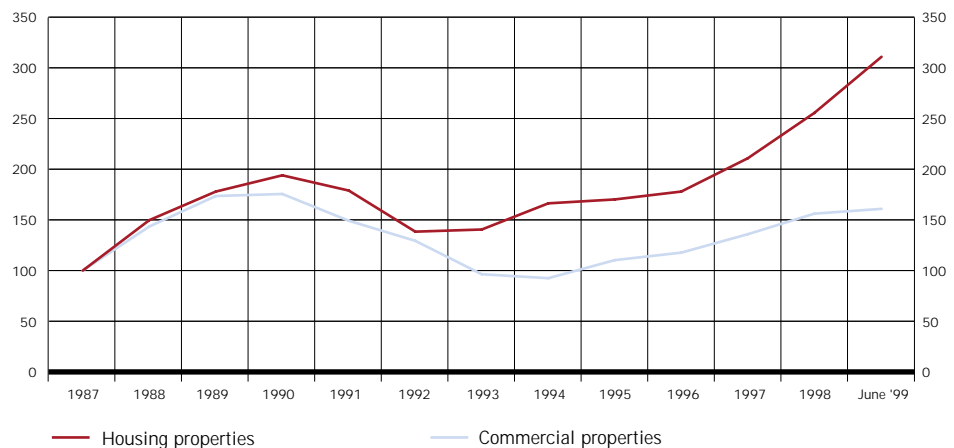
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The large price increases on rented apartments in big cities are a warning signal and bring to mind the property speculation of the 1980s. An important difference, however, is that price increases in the present situation appear in big cities where demand is very high and supply low, which naturally means increasing prices. In the 1980s, prices rose sharply throughout the country despite a relatively high level of construction. In an economic downturn or a sharp rise

in interest rates, there is a risk for a price fall, however, which can lead to payment problems. Rentals and vacancy levels for apartment blocks have a tendency to fluctuate less than for commercial premises, in changed macroeconomic conditions. This means that apartment blocks normally are associated with lower risk than commercial premises. Another difference compared with the property crisis at the beginning of the 1990s is that loans to housing properties do not seem to increase in such a dramatic way as to drive forward price trends (see the previous section on the corporate sector).

The price trend for commercial properties in big city regions has been steadily positive in recent years. Since 1995, prices of commercial properties have risen by an average of 14 per cent per year (see figure 2:10). The favourable economic development, higher rental levels, and lower interest rates have probably contributed to this development. During the first half of 1999, prices rose, however, on commercial properties by only 3 per cent, which meant a lower price increase rate than during the immediately preceding periods. The lack of commercial premises (the vacancy ratio in for instance Stockholm inner city was 2.5 per cent for the first six months of this year, which can be compared with an 11 per cent vacancy ratio in 1994) which indi-

**Figure 2:10.**  
The price trend for housing properties and commercial properties in big cities.  
Index: 1987 = 100



Source: Catella Fastighetsinformation.





cates, however, that the first six months' dampening of the rate of price increases for commercial premises may be temporary and not necessarily an expression of a price stabilisation.

Continued strong economic development combined with a low construction means that prices for both apartment blocks and commercial properties in big city regions may rise further. A continued increase in interest rates should have a dampening effect on such a development, however.

#### DIRECT YIELD

The substantial price increases on properties in big cities in recent years calls for making an appraisal of the extent to which the price trend is sustainable or whether there are imbalances, which can lead to problems for the bank sector. The direct yield shows the size of rental incomes, after deduction for operating expenses, which a property generates, calculated as a proportion of the value of the property.<sup>26</sup>

The direct yield of commercial properties for the first six months of the year was 6.2 per cent which is largely unchanged compared with 1998 (see figure 2:11). This is due to the relatively small price changes for commercial properties in combination with moderate changes in net operating income.

The direct yield for housing properties was 4.8

per cent, which is a reduction by 0.9 percentage points since 1998. The reduced direct return is related to the strong price increases on housing properties and that rents in apartment blocks have largely been unchanged. The small changes in rents are probably due to a combination of low inflation and low nominal interest rates, and the proposed temporary reduction of property tax in 1999.

By comparing direct yield with the required return on property investments, a rough indication can be obtained of expectations of real increases in value in real estate companies. The real required return may be said to consist of interest on a risk-free asset plus a risk premium and a deduction for inflation expectations. The risk-free interest rate, approximated with interest on a five-year bond, began to rise from 3.4 per cent at the beginning of April to 5.5 per cent in mid-October. The long-term inflation expectations are at present around 2 per cent. On the assumption that the risk premium is approximately the same for properties as for shares, i.e. around 4 per cent, we obtain a real required

26 For a more detailed discussion of direct return as an indicator of trends in the property market, see Financial Stability Report 1999:1.

**Figure 2:11.**  
Direct yield on commercial properties and housing properties in big city areas and five-year government bond rate.  
Per cent



Sources: Catella Fastighetsinformation and the Riksbank.

return of over 7 per cent.<sup>27</sup> If we compare this with the direct yield on commercial properties, we find that the implicit expected real growth in property values should be roughly 1 per cent annually. Against the background of the recent increases in rents for commercial properties, these implicit expectations do not seem to be exaggerated. On the basis of direct return the rate of price increase for commercial properties seems to be largely in balance with the industry's cash flows.

The trend in the apartment block sector would seem in this respect to be more problematic. The low direct return corresponds, with the same assumptions as above, to an annual real growth in the industry's cash flows of around 2-3 per cent. In the present situation, due to the rent control system it is difficult to see that the real increase in rental income will develop to a corresponding extent. It is therefore close at hand to suspect an element of speculative expectations in the housing sector, if we by this mean that price increases are based more on expectation of continued price increases than on expectations of real growth in the future net cash flows of housing properties. However, the conversion to tenant ownership and the possibilities of a abandonment of the rent control system entails a structural change, which makes direct yield difficult

to interpret as an indicator. The problems with expectations driven price increases is that they can create bigger price adjustments if the expectations are not met.

#### SOLVENCY OF REAL ESTATE COMPANIES

A prerequisite for property related loan losses arising in the bank sector is not only that property prices fall but also that the solvency of real estate companies has serious weakness. The interest coverage ratio of the real estate companies has had an increasing trend since 1992. This is above all a result of the recent years' falling interest rates. At the end of 1998, the real estate companies' interest coverage ratio was at 1.67 in relation to 1.45 the year before. The relation between liabilities and equity, the debt to equity ratio, was 3.6 at the end of 1998, which meant a small increase since 1997 (see figure 2:12).<sup>28</sup>

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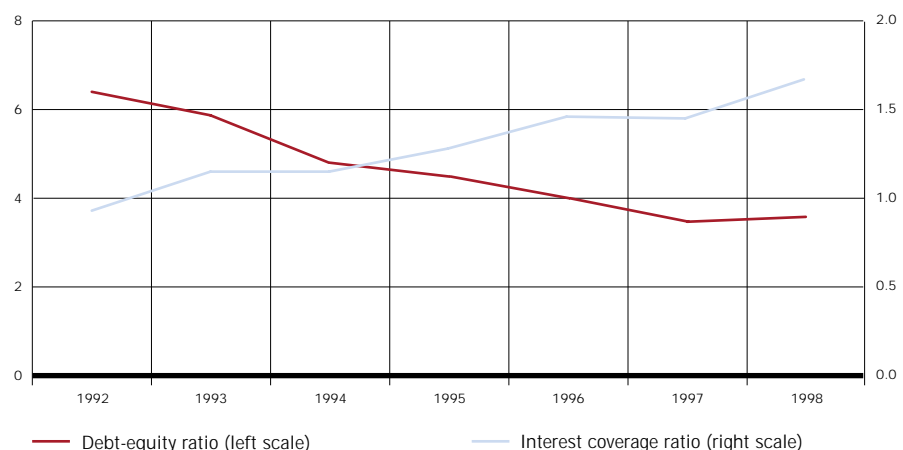
The financial situation of the real estate companies is satisfactory.

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At the same time as the direct yield fell in property investments. Above all with regard to apartment blocks — the financial situation in the property sector has developed satisfactorily.

The solvency of the real estate companies can also be assessed according to the development of

**Figure 2:12.**  
Interest coverage ratio and debt-equity rate, average values for all real estate companies.  
Quotas



Source: Business & Credit Information Agency (UC).



Swedish real estate companies listed on the stock exchange with regard to the expected probability of suspensions of payments (EDF—see section above on the corporate sector). These values can be compared with the corresponding values for some other countries' real estate companies (see figure 2:13).

As is the case for non-financial companies, the risk for suspensions of payments has fallen in real estate companies. The Swedish real estate companies have moreover improved their position in an international comparison.

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The strong price increase on apartment blocks in big city areas in combination with reduced direct return means that the price trend in this sector does not appear to be balanced.

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To sum up, the strong price increase on apartment blocks in big city areas in combination with reduced direct return means that the price trend in this sector does not appear to be balanced. Unlike the development at the end of the 1980s, however, the strong price increases are mainly concentrated to the attrac-

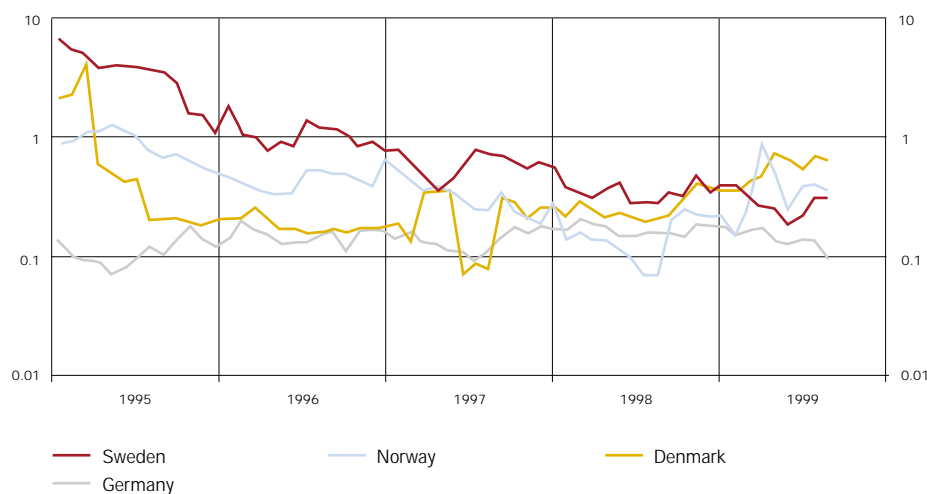
tive areas of the big cities. The price increases are probably due to quite a large extent to sales consisting of conversions to tenant-owned apartments. Neither is there a large increase in lending from banks and mortgage institutions to apartment blocks. While there is a risk for price falls in the event of a downturn, it is known from experience that rents and vacancy levels for apartment blocks tend to fluctuate less than for commercial premises in the event of a deterioration in the state of the economy. This means that apartment blocks are normally associated with lower risk than commercial properties. In the light of this, the remarkable price movements do not need to lead to problems for the banks.

It can be further noted that the financial situation of real estate companies has continually improved positively over the past five years with improved interest coverage ratio and stable debt equity ratios.

27 In investigations carried out by Price Waterhouse, it has been found that the risk premium for shares has been between 3.5 and 4 per cent in recent years.

28 Source: Business & Credit Information Agency (UC).

**Figure 2:13.**  
EDF for real estate companies.  
Per cent (logarithmic values)



Source: KMV Corporation.

# Counterparty and settlement risks at the banks

*Beginning with this report the Riksbank has started to obtain reports from the big banks on the size of their individual exposures. The result of this investigation shows that single exposures can be so large that the banks could incur problems in the event of failure of an individual counterparty. It is positive that the banks have improved their risk management in this area to some extent.*

In its work with financial stability, the Riksbank has stressed the importance of counterparty and settlement risks in the bank sector. In autumn 1998, a thorough examination was undertaken of these in the financial market report, which was followed up by a shorter report in Financial Stability 1999:1. From the perspective of the Riksbank, the foremost problem with counterparty and settlement risks is the size of exposures to individual counterparties. Individual failures can have considerable consequences for a bank and lead to problems spreading from one institution to another.

In the light of the banks' extensive exposures to counterparty and settlement risks, it is very important that these are continuously monitored. The Riksbank has therefore introduced a quarterly report for the largest banks focusing on these exposures from 1 July 1999. The results of this report are commented upon in the first section of the chapter.

As the exposure to counterparty and settlement risks can change very rapidly depending on changed positions in the financial trade, more than a statistical report is required to obtain a good picture of counterparty and settlement risks in the banks. The only way to really shed light on these exposures would, in principle be daily reports, but this would hardly be

practically feasible. For a better picture of the banks' risk profile, light also needs to be shed on risk management in this area. The second section describes the application of current risk management mechanisms and how these can develop in future.

The introduction of the euro has had effects on counterparty and settlement risks in the banks, for instance by payments being carried out in a faster and more secure way than previously. The effects of these are discussed in a third section.

## The size of counterparty and settlement risks

Counterparty and settlement risks arise within all areas of financial trade where the banks operate. When the Riksbank previously discussed these risks, the important areas were described as foreign exchange (FX), securities, derivatives and repo markets, and ordinary lending to financial institutions in the interbank market. Counterparty exposures are reported in the banks' balance sheets in a way that does not correspond to these markets, which means that the Riksbank must obtain this information in another way.

The item "Lending to financial institutions" includes both loans without collateral in the inter-bank market in Swedish and foreign currency and lending against collateral in the form of repos. The securities portfolio contains both securities which the bank has the actual right of ownership to and securities that the bank has used for its own financing through repos and which it thus does not have at its disposal in the accounts. Derivative holdings are reported as a separate item, but only in the form of the market value that a derivative contract has at a particular time. The notion value of the contract is not evident. In principle, identical positions can be achieved by a spot securities transaction in combination with a derivative transaction and by a repo,<sup>29</sup> although these are expressed in quite different ways in the accounts, since only a net value is reported for derivatives, while the whole of a repo's underlying amount is reported. Exposures in the form of settlement risks are not expressed at all in the accounts.

A bank's balance sheet provides thereby an incomplete picture of exposures to counterparty and settlement risk but it can still give an indication of the size of exposures in relation to other activities at the bank. During the past two years, these exposures, according to the accounts, have not changed in terms of trends (see figure 3:1). In all, according to the accounts, exposures have fluctuated between SEK 800 and 1000 billion and made up between 43 and 48 per cent of the balance sheet. The foremost change during the past two years has been that the banks are increasing their loans to mortgage institutions, primarily their own, and to other Swedish financial institutions, while reducing loans to foreign financial institutions. The driving force behind the increase of lending to mortgage institutions has primarily been the increasing number of borrowers wishing to have variable interest for their housing loans, and when mortgage institutions refinance these loans they normally do this by loans from their parent bank or from other Swedish banks (see further section on increased bank financing of mortgage institutions in Chapter 1). The reduction of loans to abroad has arisen as a consequence of turbulence in the international financial markets during last autumn, which led to an increasing focus on the risk in foreign interbank loans.

The risk for loan losses as a consequence of exposure to banks and other financial institutions differs in a number of respects from other credit risks in banking operations. Loans to households and companies are to a large extent well diversified and there is a risk of extensive loan losses arising primarily if a large number of borrowers are at the same time affected by payment problems. With regard to exposures to financial institutions, failures are less common, especially with regard to larger banks of good repute. The concentration of risks in the form of the size of individual exposures is therefore allowed to be greater than for other lending. Another reason for this is the way in which trade in the financial markets operates requires that it is possible to enter large positions with individual counterparties. The exposures that arise also receive a more beneficial treatment with regard to capital adequacy requirements and rules on large exposures than other lending. The consequence of this is that the effects of even individual failures can be considerable for banks. This means that there is reason for the Riksbank to take an interest in the size of individual commitments as well. Exposures between banks can give rise to systemic effects if a bank is affected by problems and in this way can contribute to crises arising that threaten the financial system as a whole.

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Exposures between banks can give rise to systemic effects if a bank is affected by problems and in this way can contribute to crises arising that threaten the financial system as a whole.

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This has led the Riksbank to see the need to obtain reporting from the major banks on the size of their largest individual exposures. Large exposures are already reported to Finansinspektionen (Financial supervisory authority) but this reporting does not include the majority of the shorter exposures that arise. In the report, the Riksbank has focused on the exposures where a more substantial credit without collateral can be considered to exist; the settlement risk in FX trade, derivative exposures, holdings of

<sup>29</sup> A repo can be regarded as a spot transaction plus a forward transaction in the same securities. For a more detailed reasoning on this, see the article *Den svenska repomarknaden* of Christian Ragnartz and Johan Östberg, (Quarterly Review, 1997:3/4).

securities that have been issued by private issuers and loans in the deposit market. Exposures in these four areas have been summarised to a total gross exposure per counterparty, according to which 15 of the largest counterparties have been ranked. Exposures in different forms of secured collateral, such as repos and equity loans, have also been reported for each of the 15 largest counterparties. Moreover, the total exposure within each respective area has been stated. In addition to these exposures, other settlement risks also arise, for instance for the securities trading. As the settlement of securities takes place by delivery versus payment (DVP) only a so-called replacement cost risk arises, the size of which is so small that it is not taken into consideration in this context.<sup>30</sup>

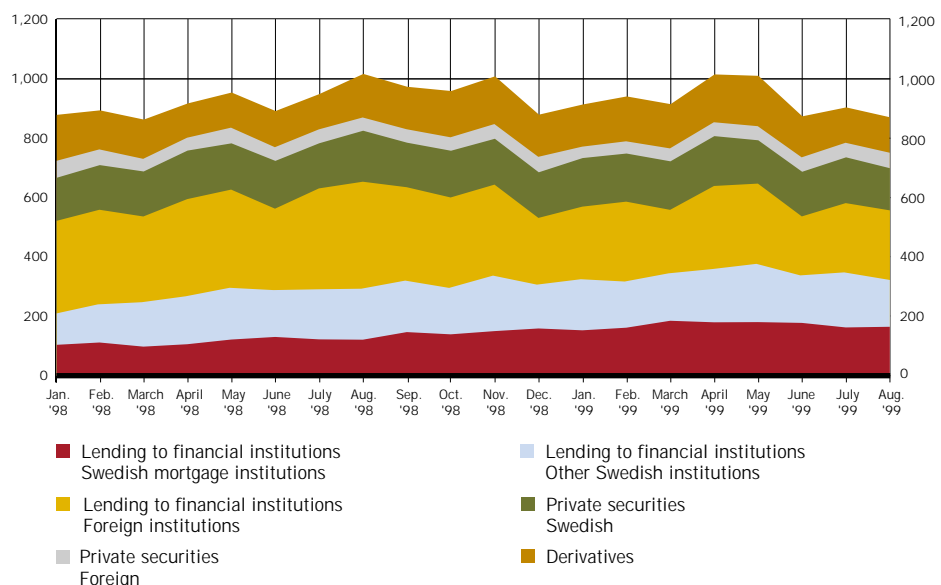
Reporting took place for the first time the 30 June 1999 and will in future take place at the end of each quarter. A deficiency with the reporting is that it only relates to exposure on a given day which can be misleading, as these exposures can change very rapidly. As the measurement is new and to some extent includes exposures that can be measured in different ways, there is also a risk that the measurement has certain qualitative defects. The reporting nevertheless provides an overall picture of how large exposures can be.

Knowledge of how large individual exposures are between banks is important when assessing the

systemic risk in the financial system. Systemic risk means the risk that a failure at one bank or another key player in the financial system will lead to other participants having financial problems and risking failure. Two types of systemic risks can be distinguished; the risk that systemic effects will arise of pure uncertainty in the market about which problems actually exist and which counterparties are affected, and that systemic effects arise by actual interbank exposures to counterparties with problems. With regard to the latter type of systemic risk, virtually no research or other empirical investigations have been undertaken, as data on individual interbank exposures has not been available. The studies that have been done have only been able to capture certain parts of the interbank exposures, above all those which can be found in the payment flows registered in the central banks' payment systems.<sup>31</sup> The Riksbank's measurement is an attempt to obtain better data directly from the source and the Riksbank considers using information from the measurement to be able to make better studies in the area.

Initially, a picture of the total size of exposures can be compared with how these appear within the bank's external accounting. The total exposure according to the accounting items is SEK 864 billion, to be compared with SEK 819 billion in the new report to the Riksbank (see Figure 3:2). The

**Figure 3:1.**  
The four major banks' counterparty exposures as shown in the balance sheet. SEK billion



Source: The Riksbank.

similarity of these figures is sheer coincidence. The difference between the two is that repos are included in the accounting items but not in the Riksbank's measurement at the same time as the Riksbank's measurement includes exposures to settlement risk in FX trade which is not included in the accounts. Repos are not included in the Riksbank's measurement, as these are regarded as lending against collateral. On the occasion of measurement, repos and exposures to settlement risk in FX trade happened to be fairly similar amounts.

*Settlement risks in FX trade* give rise to the largest exposures (around SEK 300 billion). These exposures are very short, they are assumed on average to arise for a period of around two days. This is probably an overestimation of the time period in certain cases, as settlement in certain cases can go faster, even though it sometimes can go slower. That exposures are short also reduces the probability for credit losses occurring. This is due to there being a smaller risk that a counterparty's creditworthiness will deteriorate over as short a period of time as two days than over a long period such as, for instance, a year. The smaller risk is related to the fact that if information about a deterioration in creditworthiness reaches the bank, the bank can decide to reduce its exposure if it arises from claims with short maturities. This is not possible with longer maturities. How-

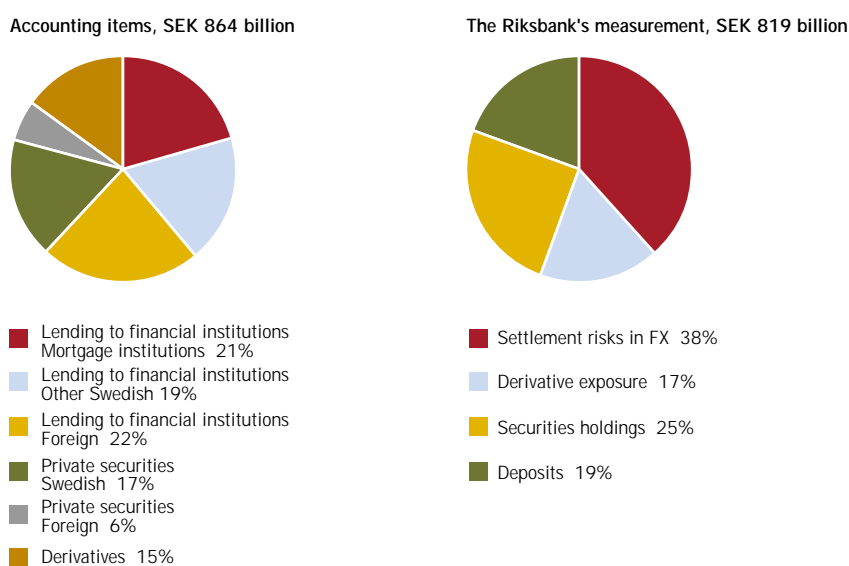
ever, the counterparty can be on the verge of suspension of payments when credit is provided and suspension of payments occur during the maturity of the exposure. Taken as a whole, exposures in FX trade entail lower risk than longer commitments although the Riksbank considers that they should still be regarded as unsecured loans. There is a risk that the counterparty will fail even though this has not been preceded by any notice of deterioration in creditworthiness. The way in which the banks handle these exposures reflects to some extent that exposures for settlement risk are not regarded as other credit risk exposures (see the section on risk management).

*Derivative exposures* total to around SEK 140 billion. The exposures are large above all for counterparties outside Sweden, but less for Swedish counterparties. The derivative contracts extend over a number of different maturities but are on average considerably longer than within other areas of financial trade. This means that the probabilities of counterparty failure are, all other things being equal,

30 The concept replacement cost risk, especially in connection with securities transactions, is discussed in more detail in Financial Market Report 1998:2.

31 A study that contains an interesting quantification of the spreading effects and of the problems with the accessibility of data is "Interbank exposures: Quantifying the risk of contagion", Craig H. Furfine, BIS Working Papers no. 70, June 1999.

**Figure 3:2.**  
The size of counterparty exposures according to the accounts and according to the Riksbank's measurement (gross)



Source: The Riksbank.



larger within this area. At the same time, the effects of netting are important here. Netting means that off-setting the credit positions that two parties have in relation to one another can be netted if either of them suspends payments. If netting is taken into consideration, the largest exposures are reduced on average by around half. It is also within this area that other risk reduction measures, in the form of providing collateral and central clearing exist, (see further section on risk management). A special risk for derivatives is that exposures can change greatly in the event of market movements, as the exposure is a function of the value of the underlying asset, although with a large lever.

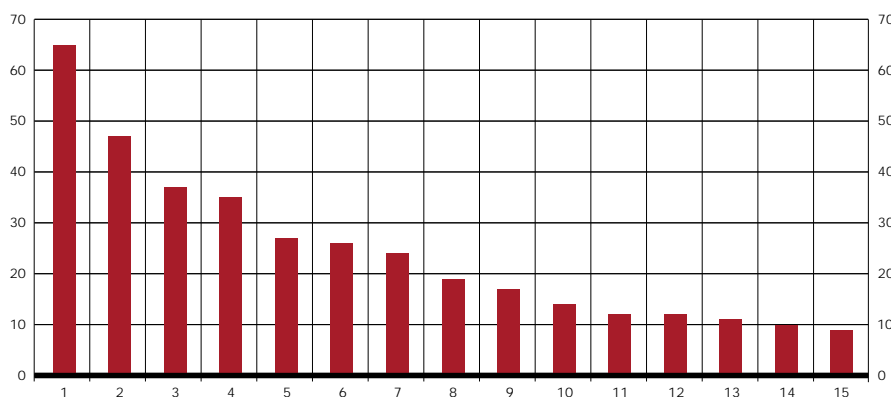
The portfolio of privately issued *securities* amounts to around SEK 200 billion. It is more concentrated to particular counterparties than the other areas of counterparty exposure. The predominant part of the banks' securities holdings consists of Swedish mortgage securities (35 per cent of the banks' total holdings of private securities). It thus involves exposures to the large Swedish bank groups. The banks also hold large volumes of mortgage securities, issued by their own mortgage institutions which contributes to the connection between the bank and the mortgage institution in the same group being large. This is a contributory reason why the bank and the mortgage institution within a group should not be analysed as separate companies. The

holding of foreign securities is small and issuers are not found to any great extent among the sphere of the largest counterparties.

Exposures in the *interbank market* are of the same size as in the derivatives market. Loans typically have a shorter maturity than derivative positions and the size of exposures are not as volatile as these. In the Riksbank's investigation of counterparty exposures during a two-week period in August 1998,<sup>32</sup> 56 per cent of the lending in the deposit market were overnight loans and only 17 per cent had a maturity of over a month.

In order to obtain a view of the size of individual exposures in relation to the bank's activities, they can be placed in relation to the bank's primary capital. Primary capital is the most secure part of bank capital as defined by the capital adequacy rules. Losses are deducted from this. Primary capital must correspond to at least 4 per cent of a bank's risk weighted assets and shall serve as a buffer for losses. Putting an exposure in relation to the primary capital base, show how large a part of the bank's equity risks being lost if a bank makes a loss corresponding to the total exposure. However, it is sufficient that a certain portion of the equity shall be used up for the primary capital coverage to be under 4 per cent, which in principle means that the bank does not have permission to continue to carry on banking activities. If a bank has 5 per cent in primary capital

**Figure 3:3.**  
The fifteen largest exposures on average for the four major banks, as a proportion of the primary capital



Source: The Riksbank.



coverage, it is sufficient that 20 per cent of the primary capital base is lost for the capital adequacy requirement not to be met.

On average, the largest single counterparty exposure at the time of measurement for each of the largest banks was 65 per cent of the primary capital base (see figure 3:3). There is a considerable spread between the banks here, so that the average is somewhat misleading.

How large the actual loss would be for the individual banks if the largest counterparty failed depends on how large the provision is for loan losses. This in turn depends on the expected recovery from the bankruptcy estate and to what extent there are positions that can be netted. However, it is not improbable that the largest counterparty's default would mean that the average bank would no longer comply with the capital requirement.

The settlement risk in FX trading accounts on average for almost half of the exposure for the largest counterparties. For the largest counterparty, the interbank exposure stands for a quarter of the total exposure, while the remaining quarter is evenly divided between securities holdings and derivative exposure. The shorter and therefore less risky exposures thus correspond to around 75 per cent of the individual largest exposures to be compared with half of the total exposure for counterparty and settlement risk (compare figure 3:2).

The size of the individual largest counterparty exposures decreases rapidly. The fifteenth largest counterparty exposure represents 9 per cent of the primary capital.

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Altogether, it can be noted that individual exposures in the banks can be of such a size that the banks may have considerable problems even in the event of individual counterparty failures.

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Altogether, it can be noted that individual exposures in the banks can be of such a size that the banks may have considerable problems even in the event of individual counterparty failures. In certain cases, an individual counterparty failure would probably entail that the capital adequacy requirement was not complied with. However, it appears as less probable that

a failure could lead to the whole capital base being wiped out. However, it should be emphasised that even if the Riksbank's measurement shows actual exposures they are only an observation at a particular point in time. It is, of course, conceivable that these exposures are both larger and smaller at other times. When the Riksbank measured counterparty exposures a year later over a two-week period the largest exposure in the interbank market amounted to about 50 per cents larger than the average exposure, which gives an indication of how large the variation can be.

The reasoning that is made on the effects of a single counterparty failure applies only to the direct effect of a single counterparty failure. An indirect effect arises also from the fact that certain other counterparties may default due to a given counterparty's failure, and that banks can thereby be affected by further losses due to this, a so-called *second wave* of failures. Moreover, uncertainty about the parties that are affected could lead to the financial system ceasing to function, as parties would hesitate to take negative positions on each other due to fear of being affected by further losses.

The Riksbank's conclusion is that the levels that individual exposures can amount to are a problem from a system safety point of view. To some extent, this is a consequence of the Swedish bank system's high concentration to a few major players. Generally, it can be noted that the banks, despite this, seem only moderately concerned about the risks that large counterparty exposures to other players in the Swedish bank system entail. The Riksbank's new quarterly statistics are one way of highlighting these risk exposures and will serve as a basis in the ongoing discussions with the banks. The Riksbank has clearly stated that it is regrettable that the rules for major exposures do not in practice cover the majority of exposures with short maturities and to financial institutions. However, this is not only a Swedish phenomenon but concentration risks are a neglected area in the international work with developing a regulatory framework for the financial sector.

32 Financial Market Report 1998:2.

## Risk management

Counterparty and settlement risks are risks that can rapidly change due to how the bank opts to act on a particular day or to what extent the bank decides to take collateral. It is therefore possible that risk exposure can change very quickly. For this reason the Riksbank is also interested in the banks' procedures for managing this risk. In this context, a number of questions about credit management in general also come in.

Within the work of regulation of the financial sector, the banks' risk management has come more and more in focus. In the Banking Legislation Commission's proposal for new Swedish banking legislation, and in the proposal for new capital adequacy rules for banks which the Basel Committee for Banking Supervision published in June this year, risk management has been given considerably more importance than in the present banking regulations.<sup>33</sup> An overview of the Basel Committee's proposals are provided in the panel below.

### THE BASEL COMMITTEE'S PROPOSAL FOR NEW CAPITAL ADEQUACY RULES

In June this year, the Basel Committee on Banking Supervision published a proposal for new capital adequacy rules for banks. The proposal has now been circulated for comment to authorities, market participants, and others in a large number of countries. Comments shall be submitted to the committee at the latest by March 2000. The committee will then present a final version before the end of 2000. Thereafter there will be a transitional period for introduction of the rules that will probably extend over a number of years.

The proposal presented for new capital adequacy rules is based on three "pillars";

1. *Quantitative rules* are traditional requirements on capital in relation to risks.
2. *Qualitative rules* involve increased demands on banks' risk management and internal control systems and that the supervisory authority can undertake corrective measures when a bank's capital adequacy decreases, even though it is still over the minimum level.
3. *Rules on transparency*, which entail increased demands for publication of banks' equity and risk exposure.

The new capital rules apply, as today, to "internationally active banks". However, they are written in such a way so that the national authorities can decide that they are also to be used for domestic banks and possibly other financial institutions. In Sweden, the rules have to date been applied to all banks and also to securities companies. In this panel only the proposed quantitative rules are evaluated.

#### *The quantitative rules*

The quantitative rules include capital requirements for *credit risks*, *market risks* and *other risks*.

The capital requirements for credit risks are based as previously on standardised risk weights. However, an important new feature is that it is proposed that a more important role is to be given to external rating as a basis for establishing the risk weights of different assets. As well as a revised standard method, which is intended to be applicable by most banks, it is made possible in principle for more sophisticated banks to use internal credit risk rating systems and models as a basis for calculating capital adequacy requirements. By offering an alternative alongside the standard method, the Basel Committee hopes to be able to encourage banks to continue to develop and improve the internal systems for credit risk management and risk measurement. However, a number of technical and conceptual problems remain to be solved, before such an alternative will be feasible in practice.

As an extension of the most advanced credit risk rating systems, a development of *portfolio-based credit risk models* takes place. Instead of only adding individual credit risks, such models take into consideration the co-variation between different "credit events". The intention of such models is inter alia to assist the banks to analyse the global risktaking at the bank. A portfolio-based model, which is well supported, should reflect the bank's actual risk to a greater extent than non-portfolio-based models and is therefore desirable both for the bank and for the supervisory authority.

Before any of the internal methods can be used for formal capital adequacy requirements, the supervisory authorities must, however, be convinced that the models are conceptually sound and empirically validated, and provide comparable capital adequacy requirements. The Basel Committee has made the assessment that at present a greater number of more serious problems remain to be solved for portfolio-based credit risk models than for internal risk rating systems, before these requirements are met. The committee has therefore stated that, in an initial phase, it is primarily the non-portfolio based internal risk rating systems that can come into question for new capital adequacy requirements. However, the committee monitors developments closely and hopes to engage the banking industry in a constructive dialogue. Underlying the committee's proposal, there is an explicit hope that the improved incentives to refine the internal credit risk management systems are also preparing the way for a future transition to more integrated credit risk models.

The Basel Committee also intends to produce

guidelines to permit capital adequacy ratios to reflect the existence of guarantees and collateral to a greater extent than at present. Other methods for risk reduction, for instance, securitisation, credit derivatives and netting in the balance sheet, will be reflected in lower capital requirements to a greater extent than before.

This proposal does not mean any change in the current methods of calculation and capital requirements for market risks.

The proposal entails finally an opening to make capital requirements for operational risks and for banks that have very large exposures to interest risks totally which differs from today when only interest rate risks in the trade portfolio are subject to capital requirements.

The final rules will not be binding on Sweden before the proposal has been approved by the Riksdag and led to changed legislation. Sweden will also be affected by the rules leading to new capital adequacy directives from the EU, provided that they are adopted by the Basel Committee after the referral process.

The Riksbank has previously commented on the banks' risk management within the field of counterparty and settlement risks.<sup>34</sup> As this is an area which is developing the whole time in the banks, it is important to monitor it. It is important that the Swedish banks make use of the available opportunities for risk reduction. In the section, they describe the most important risk reduction methods that are used at present.

#### THE LIMIT SYSTEM

Credits to financial companies are normally preceded by the banks setting limits in relation to individual counterparties. The limit defines how large the total exposure to a counterparty may be. In the normal case, an assessment of the limit is made on one occasion per year. Once the limit is set, it is in principle possible to carry out transactions and give individual credits without making an individual credit decision. This is an efficient way for the banks to work and financial trading would not function if it were necessary to make an assessment for every individual transaction.

The banks' setting of limits is a part of the ordinary procedure of granting credit. Granting takes place in a hierarchical structure where the size of the limit controls the final instance in which the decision is made. It is thus size rather than actual risk which is decisive for those who will make the decision. This naturally means a risk that the really difficult decisions will have too little attention as less difficult credits take too large a part of the time of the decision-making body. With regard to the financial counterparties, it is in normal cases a board decision. A limit is then distributed to the organisation and in some banks limit follow-up only takes place at local level, while others monitor the total limit daily.

As a consequence of the decision-making process, limits tend to be large. It is quite simply wished to include days with extremely high trade with a single counterparty within the limit to avoid

33 For a more detailed discussion of both these proposals for reformed bank rules, see "Mot nya nationella och internationella bankregler" (Toward new national and international rules for banks) by Göran Lind and Johan Molin, Quarterly Review, Sveriges Riksbank 1999:3.

34 See Financial Market Report 1999:2.

taking separate decisions to increase the limit when turnover in the market is high, which in practice is impossible as decisions in these cases normally take place in the board. Since the limits are also distributed and then monitored locally, this means that more "air" is built into the system in the form of unused credit facilities. This applies particularly if a counterparty is active in a number of the geographical markets which the bank is represented on, and if it is active in a number of market segments within financial trade. In practice, the degree of use in many cases is only a minor part of the total limit. This means that the banks' credit risk exposure theoretically could be multiplied without any automatic control stops coming into effect in the system.

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That limits in practice are regarded as a free resource internally in the banks means that the incentive for restricting them is lacking. Against this background, it seems natural that for instance traders want to have limits on so many as possible in the event of them being required one day. A more clear capital allocation, internal pricing, or some other form of measure that would create an incentive to keep down "air" in the limits would therefore be positive. However, this form of means of control is largely lacking today.

A number of banks state that they have become more aware of risk after last autumn's turbulence in the financial markets. This has in practice affected country limits, analysis of emerging markets, and in certain cases also resulted in a reduced group of counterparties.

Exposures to settlement risk in FX trade have previously not been regarded as credit exposures by the Swedish banks in the sense that they have been included within the limit systems. The size of such exposures has only been restricted by the size of trade, not by considerations and measurement of the size of exposures to individual counterparties. A number of banks have, however, introduced settlement limits during the past year. These limits are normally separated from the ordinary credit limit in the banks in such a way that they are decided and measured per se. However, it is important that the bank can measure the whole of its exposure to a counterparty, which today can only take place when required, by manual work.

Settlement risks in FX trade have received varying attention in the international authorities' cooperation. The panel below contains a brief description of the guidelines for the national supervisory authorities' requirements on banks that have been produced by the Basel Committee on Banking Supervision in close collaboration with the G10 Committee for Payment and Settlement Systems.

## THE BASEL COMMITTEE'S GUIDELINES FOR SETTLEMENT RISKS IN FOREIGN EXCHANGE TRANSACTIONS

The Basel Committee on Banking Supervision has worked out guidelines for the national supervisory authorities' requirements on banks with regard to the management and the measure of settlement risks in foreign exchange transactions. The guidelines include requirements for correct measurement methods, and improved handling of exposures by for instance introduction of limits and reserve procedures. After referral for comment by the market participants, these guidelines will be implemented by the national supervisory authorities, in Sweden accordingly by Finansinspektionen.

The demands made on the market participants with

respect to settlement risk in foreign exchange transactions are focused on a number of types of risk reduction measures. Some requirements aim at the banks having improved control over their respective exposures, others at explicitly reducing the size of the exposure.

In the guidelines it is established that this form of settlement risk is a credit risk, which entails that exposure shall be handled like all other forms of credit risk at the bank.<sup>35</sup> This entails that a bank shall have clear procedures for measuring and handling its aggregate credit risk in relation to a counterparty. Every bank shall set limits for how great an exposure to this risk, the bank is

prepared to bear for each counterparty. The bank's measuring methods shall take into consideration the actual exposure time, from the time exposure starts until it is completed. It is of great importance that the bank's measuring method does not underestimate the exposure.

The guidelines also indicated that the bank shall actively endeavour to reduce their exposure to settlement risk in foreign exchange transactions. This can for instance take place by reducing the exposure time or by using the bilateral netting arrangements available in the market.

Banks shall also have well organised reserve and crisis management procedures which are to cover all possible events such as operational problems, counterparty failure and market-related events. The guidelines also stress the importance of stress tests in this field. The banks shall have adequate internal control procedures to ensure that the bank's exposure to settlement risk in FX transactions is minimised to the greatest possible extent.

35 See Financial Market Report 1998:2 for a more detailed explanation of the risks that arise in settlement of foreign exchange transactions.

#### NETTING

Netting means that a bank in the event of the failure of a counterparty has the right to deduct any liabilities from the claim that the bank has on the counterparty. This means that the bank only has a claim on the bankruptcy estate that amounts to the net amount of receivables and liabilities. Netting is thus in principle the same as set-off. However, there is a certain difference between these two concepts. The foremost difference is that set-off rules only include the corresponding obligation to pay (or identical payment obligations) while netting rules also allow deduction of equivalent liabilities to supply financial instruments of various kinds, or to deduct a delivery obligation against a payment obligation. Under Swedish law, netting requires that a special agreement has been drawn up between the parties. Netting agreements can also be used in situations where set-off would conceivably be possible, although it is uncertain whether set-off is legally sustainable, for instance when the legal systems of a number of countries are involved.

Netting comes into question in the first place for derivatives, repos and equity loans where the largest corresponding positions normally arise. The netting agreements that are entered into are normally standard agreements produced by international industrial organisations; ISDA agreements for derivatives, PSA/ISMA for repos, and OSLA for securities loans.<sup>36</sup> This section only takes up netting in the derivatives market since the counterparty risk is not so large with regard to repos and securities loans and therefore the risk-reduced effect is less important.

All banks have to a large extent signed netting agreements with their larger counterparties. Netting agreements are normally "global" in the sense that they include all different types of derivative positions that arise. However, it is uncommon with agreements that cover exposures within different product areas. Netting affects to a varying extent the measurement of credit exposure to a counterparty. In certain cases, less use of a limit is made for a counterparty if a corresponding position exists, in other cases not, so that there is an overestimation of the actual credit risk exposure at the banks. If netting is taken into consideration, the banks' largest derivative exposures are reduced on average by around half.

Agreements on netting in the interbank market exist but are not used to the same extent as in other markets. One reason is that corresponding positions arise to a smaller extent in the interbank market than in the other markets. Another is that set-off is considered to be possible between Swedish counterparties for positions in the deposit market, even without special agreements being drawn up. A third reason is that deposit netting does not mean that exposures can be reduced with respect to capital adequacy. At the same time, there are really few reasons for not drawing up netting agreements, if the corresponding positions arise at all, so that it can be considered that an increase will take place in deposit netting for Swedish banks in future.

36 International Securities Dealers' Association, The Bond Market Association, New York (formerly the Public Securities Association), International Securities Market Association and Overseas Securities Lending Agreement.



#### COLLATERAL

Taking and providing collateral for positions in the derivative market is becoming increasingly common internationally. In Sweden, however, this is considerably less widespread, which can partly be explained by the banks' derivative exposures in certain cases not being as large in relation to other activities. In such cases, the banks consider that it is not motivated with the provision and taking of collateral as the cost is too great in relation to the desired risk reduction. However, one of the Swedish banks has a developed collateral procedure, with system support for daily provision of marginal collateral and appears to be well to the forefront in international development.

However, the banks that do not use collateral are showing an interest in principle in starting to do so, although they point out that large resources are required in the form of system support. To obtain efficient management, both the taking and provision of collateral and netting between products must be able to be carried out with a high degree of automation. In addition, it is required that agreements are signed with their counterparties, which takes time as the legal situation is complicated. A variant of the provision of collateral in long derivative contracts is to carry out cash payments to even out positions. This means that when the market value of a derivative position achieves a certain size the parties zero the transaction by the party with a negative position paying the change in market value to the opposite party. Cash payments can also take place with a certain periodicity for instance daily. In principle, the procedure still entails that cash is used as collateral. The effect on credit exposure will then be the same as the provision of collateral, although cash has the disadvantage that it is often more expensive to use as collateral than securities.

Instead of taking collateral from their counterparties the banks can use a clearing house which acts as a central counterparty. For instance, OM provides clearing for OTC derivatives. However, the Swedish banks have displayed only weak interest in this alternative and consider that while the risk reduction is uncertain, the cost is often high. As long as there is a limit capacity in relation to a customer, it is consid-

ered in some quarters that processing contracts by clearing only involves cost and that it is natural to refrain from doing so. For the same reason, it also happens that the corresponding derivative is traded OTC instead of trading, for instance forward rate agreements, on a derivatives exchange.

In principle, the unsecured lending that the banks provide in the interbank market can be secured by using repos. For the banks, however, these two forms of lending do not appear as an alternative to any great extent. In the first place, repos are used for securities transactions and the financing of these, while the interbank market is used for processing liquidity. An exception from this is intraday and overnight loans from the Riksbank where collateral is required. In relation to less creditworthy counterparties, repos are used, however, as an alternative to other lending.

The banks measure credit exposure to repos in different ways. It happens that repos only take up limit space if the value of the collateral is less than the value of the loan and that the whole credit is regarded as a credit exposure.

#### SUMMARY

The banks have to some extent improved their risk management in the area of counterparty and settlement risks during the past year, partly linked to experiences from last autumn. With regard to the limits system, the introduction of new settlement limits for foreign exchange transactions is most positive. However, it is a problem that the limits are so much larger than the use, as it means that exposures can increase very rapidly without any control stops coming into effect. In combination with the banks in many cases not having a developed pricing of capital use, incentives are largely lacking to reduce counterparty exposures. As the limits for a number of reasons have to be large in relation to the actual use, considerably larger exposures can arise than the bank should strive to take into consideration the return generated by the transactions in question. Other deficiencies in the limits system are difficulties in carrying out global monitoring of limit use and follow-ups at group level.

A positive development in the derivative market

is that netting seems to be well-developed in the banks. Netting agreements are used to a large extent for the largest counterparties and to the extent that they are lacking, improvements are aimed at. An increased use of netting agreements in the interbank market may be desirable in those cases where corresponding positions exist. However, this need not be the case as corresponding positions do not arise to the same extent as in the derivatives market.

Another way of further reducing exposures in the derivatives market is to use collateral to a greater extent, which generally does not seem to have become so widespread in the Swedish market. High costs in relation to the size of the trade is one reason given by the banks for this. Likewise there is a potential for reduced exposures in the derivatives market by use of clearing but it would seem in the first place to be used for exchange traded products where clearing is the norm in the market. Otherwise, the banks regard clearing to a large extent as a sheer cost. This approach reinforces the picture of certain counterparty exposures being regarded as verging on a "free utility" in their own activity, and that it may be necessary for the authorities to make greater demands on the banks' approach in this respect.

## Reduced counterparty and settlement risks in relation to EMU

### COUNTERPARTY RISKS WITH CORRESPONDENT BANKS

In order to shed light on how the introduction of the euro has affected the banks' counterparty and settlement risks, it is appropriate to begin by describing how a traditional commercial payment takes place. The banks have previously handled payments in foreign currency by using correspondent banks. The various components in a traditional payment with the aid of correspondent banks can be illustrated by the following example.

- 1) The Swedish company is to pay DEM 100 to the German supplier. The Swedish company instructs the Swedish bank to make the payment.
- 2) The Swedish bank takes out the corresponding DEM 100 from the Swedish company's account. Thereafter they send a payment instruction to their correspondent bank German bank 1 to withdraw DEM 100 from the Swedish bank's account there and send this money to the German supplier's account in German bank 2.
- 3) German bank 1 carries out the payment to German bank 2 via a domestic payment system.
- 4) German bank 2 registers the money in the German supplier's account with them.

A payment transaction of this kind should normally take around 3-4 days from the Swedish company given them the payment instruction until the German supplier has the money in its account.<sup>37</sup> In practice, it has proven that payment can take a considerably longer time as both sender and recipient bank delay the payment for a few additional days to gain float income.<sup>38</sup>

In this context, the most important part of the transaction, the interbank part (step 2 and 3 above) normally takes around 2 days. The risks that exist in this type of transaction are related to the Swedish bank having to have money in an account at German bank 1 and thus a credit risk exposure to them. The alternative is that German bank 1 gives an intraday credit to the Swedish bank. As these credits usually take place without collateral, this means that German bank 1 takes a risk on the Swedish bank. It should, however, be pointed out that banks often endeavour to zero their correspondent bank accounts each day, so that it mainly concerns intraday exposures.

<sup>37</sup> It has been assumed in the example that the Swedish bank has DEM. The alternative is that the bank must purchase DEM in the market which means that an FX transaction is added to the payment. Another example below shows how the FX transaction takes place.

<sup>38</sup> For a discussion of float, see Lybech The float in the payment system, Quarterly Review 1997:3/4.



## RIX, E-RIX, TARGET AND EBA

All payments in kronor between Swedish banks pass sooner or later through RIX, the Riksbank's interbank and clearing system. RIX is a system where payments are settled gross in real time (RTGS). This means that payments are settled one by one in the same instant that they are initiated by the participant provided that the latter has cover for them. In January 1999 the RIX system was divided up into two parts, K-RIX for kronor and E-RIX for euro. In order to support the common monetary policy, the national interbank systems within the EU were linked together in a common network for cross-border payments called TARGET (Trans-European Automated Real-time Gross Settlement Transfer system). Target is based on the central banks acting as

correspondent banks for one another. Within the framework of E-RIX both cross-border payments in Target and domestic euro payments between RIX participants are settled. It is up to the RIX participant to determine whether he wishes to take part in both K-RIX and E-RIX or only one of the systems.

An alternative system to Target is EBA's (Euro Banking Association) clearing system Euro-1. Sixty-five banks are included in EBA's daily net settlement including the four large Swedish banks. EBA is the system used by the Swedish banks for the major part of their payments in euro. Settlement takes place once a day, between 4 and 5 pm in Target.

With the introduction of the euro, new ways of handling cross border payments in the EU have arisen. The Swedish banks no longer need to use correspondent banks to send or receive payments in euro. Instead they can use some of the cross-border payment systems for euro (see panel below). Already prior to the introduction of the monetary union, the banks started to review their network of correspondent banks within the euro area. The number of correspondent banks has successively diminished. This process has continued with accelerating speed during 1999 which is natural since the traditional correspondent bank arrangements are not in principle necessary in the euro area.

Today, only very few payment instructions are carried out in euro via correspondent banks and in all banks, very small commercially related transactions are involved. Instead, all the largest payments are made via Target, while the majority of financial and commercial payments take place via EBA clearing (see panel). In terms of the number of payments EBA clearing is considerably larger than Target but the difference is not so great with regard to the value of the payments.

By payments in euro being handled in this way, settlement takes place already the same day—in real time in Target and in EBA once a day. The credit

risk that was previously linked to the correspondent banks has been reduced for payments that were carried out via EBA and Target, where settlement takes place via accounts at the central banks. It also is usual that correspondent bank arrangements include intraday credits, for which collateral is only provided in exceptional cases. Collateral for all intraday credit is provided in Target and in EBA there are settlement limits and collateral requirements. Since payments today primarily pass through one of these systems, exposure to counterparty risks has reduced as the risk of spread of liquidity problems.

### SETTLEMENTS IN FOREIGN EXCHANGE TRANSACTIONS

It has been possible to reduce exposure to settlement risk in foreign exchange transactions by the settlement time in certain cases being shortened as a result of Swedish banks having access to both RIX and Target. Normally, there is no access to the central bank system in another currency, but as the Riksbank also provides E-RIX with a connection to Target, this is a new development that the Swedish banks can benefit from. The effects on the settlement risk can be illustrated by an example of a foreign exchange transaction between two Swedish banks from the time before EMU:

- 1) Day T<sup>39</sup>: Swedish bank 1 buys DEM 200 from Swedish bank 2 at a rate of 4.50
- 2) Day T+1 Swedish bank 2 sends a payment instruction to its correspondent bank in DEM (K2) to pay DEM 200 to Swedish bank 1's correspondent bank in DEM (K1)
- 3) Day T+2: K2 pays DEM 200 to K1 in the German payment system
- 4) Day T+2 Swedish bank 1 pays SEK 900 to Swedish bank 2 via the RIX system
- 5) Day T+3 Swedish bank 1 is informed by K1 that the money has been received.

The example shows how settlement of a foreign exchange transaction takes place in practice. In this example, Swedish bank 1 is exposed to a settlement risk from having paid the currency on day T+2 until the bank during day T+3 receives information that the money has been paid into its account in K1. Swedish bank 2 has a corresponding exposure from the day T+1 it sent the payment instruction to K2 until its money has been received in RIX during day T+2.

Through the arrival of faster routes of payment that have developed in connection with the introduction of the euro, and the fact that the Swedish banks have access to these channels of payments, it has been possible to reduce this exposure. In the above example, we assume that the transaction took place today instead and was for purchase of 100 euro at the rate 9.0. In this case nothing happens before day T+2 when the Swedish bank 1 in RIX

pays SEK 900 to Swedish bank 2 which in turn pays 100 euro to Swedish bank 1 via E-RIX. Today, there is no facility which make these two payments wholly dependent on one another, so-called payment versus payment (PVP), so that some intraday exposure arises. Nothing prevents the banks, however, from reaching an agreement that these payments shall be sent at the same time and by agreement in practice eliminating the settlement risk in all transactions that comply with the agreement.<sup>40</sup>

In the above example, we have assumed that two Swedish banks are involved. If a Swedish bank is instead engaged in a transaction with a German bank, this means in principle the same reduction of settlement risk for the Swedish bank, while the German bank incurs an exposure for one to two days depending on it not having access to RIX but having to use a Swedish correspondent bank. In table 3.1 below, an account is provided of the time that exposure to a settlement risk in FX trade consists of full credit risk.

The exposure time, which is affected by the opposite party and the currencies that are traded, can be seen from the perspective of a Swedish bank. As pointed out above, it is a prerequisite that the banks use the ability to synchronise payments between two payment systems, which is not always the case in practice.


39 Day T means the day on which the trade is initiated (T=trade). This terminology is commonly used when discussing settlement cycles.

40 As long as there is no functionality which retains the one payment until the other has been carried out, there is always the risk that one bank will pay and the other not fulfil its undertaking so that the risk remains. In normal cases, however, such an agreement should eliminate the settlement risk.

**Table 3.1**

Credit risk exposure in number of days in FX trade from the perspective of a Swedish bank. It is stated within brackets what applied for EMU currencies before EMU started in the cases where a reduction took place.

Swedish bank trades with	RIX-member	Target-member	Other bank
<i>SEK/euro</i>	Intraday (1-2)	Intraday (1-2)	1-2
<i>SEK/other</i>	1-2	1-2	1-2
<i>Euro/other</i>	1-2	1-2 (2-3)	1-2 (2-3)
<i>Other/other</i>	2-3	2-3	2-3



As the Swedish banks only have a small portion of foreign exchange transactions with Swedish banks as counterparties, around 5-10 per cent, the effect of risk reduction between them is limited. From the turnover statistics that the Riksbank has today, it has not been possible to interpret how large a portion of foreign exchange transactions takes place with Target member counterparties or the currencies that they trade with. It is not therefore possible to quantify the risk reduction that has taken place.

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The exposure to counterparty risks deriving from correspondent bank arrangements has been reduced and can be expected to decline further.

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Altogether, this means that the exposure to counterparty risks deriving from correspondent bank

arrangements has been reduced and can be expected to decline further. At the same time, it has been possible to reduce a part of the exposure to settlement risks in foreign exchange transactions which make up full credit risk by payments in euro being carried out much more quickly than was possible in the previous 11 national currencies that are now part of EMU. However, volumes have increased to some extent. A number of banks state that they have experienced an increase in the number of commercial payments to Euroland and that, while interbank payments have reduced in number, the value of the payments has increased. This means that in many cases increased volumes may be involved, but that the risk exposure for these is for a shorter time period.

# Preparations for the year 2000 transition

*Virtually all Swedish financial institutions have satisfied the regulatory requirements connected with year 2000 preparations and contingency planning. Even though it is the responsibility of the individual institutions to prepare for the transition, the Riksbank has worked with its own systems and also with financial market participants so that the payment system and all of its components will work during the millennium transition without serious disruptions. During the second half of 1999, financial institutions and market authorities have focused their attention on questions connected with liquidity and contingency planning. The Riksbank's contingency planning has as its goal to ensure that services vital to the payment system such as securities pledging will function.*

## Liquidity in the bank system over the millennium transition

Testing and preparations to ensure that the transition to the next millennium will be as smooth as possible have been completed. There is every indication that business will continue as usual over the millennium transition. However, market authorities and financial institutions both at home and abroad are nonetheless taking precautions to handle any problems, which may arise due to technical problems at the yearend or in case the public or market participants change their behaviour.

One question which has been discussed is whether or not there is a risk that banks may have a shortage of liquidity around the end of the year and if this is the case how they would manage this. Uncertainty about the supply of liquidity around the end of the year has led some financial institutions and companies in Sweden and abroad to increase their stock of liquid assets and to enter into forward

loan agreements that run over the millennium transition.

One way to quantify the liquidity premium for funds around the end of the year is to calculate the butterfly spread over the year-end. The starting point for calculating this butterfly spread is the interest rate on the three-month forward rate contract settled in December, that is to say the expect rate on a three month loan running from the middle of December over the millennium transition to the middle of March. Since this contract provides liquidity over the transition period, its interest rate should include the liquidity premium. The average of the interest rates on the September 1999 contract and those on the March 2000 contract are subtracted from the rate on the December contract to calculate the spread. The average of those two rates should reflect market expectations for interest rate developments but since the two contracts do not run over the millennium transition their rates should not include the millennium liquidity premium. The difference between the December contract and the average of the

rates on the contracts surrounding it should isolate the risk premium associated with the changeover. The butterfly spread in Sweden has followed the same pattern as the spreads in other major markets. They increased over the summer and then fell again in September. The spread in Sweden fell to 4 basis points in September while the average over the last 12 months has been 11 basis points.

The butterfly spread decreased steadily as market participants have learned that the financial sector has successfully completed preparations for the millennium transition and gained greater confidence in the liquidity situation. The banking system as a whole can have a liquidity deficit when the public has increased its demand for banknotes and the banks do not have enough eligible securities to use as collateral to borrow the amount needed in the Riksbank. An increased demand for banknotes is the only reason why the banking sector as a whole can have too little liquidity and must borrow from the Riksbank.

Banks, which have access to the central bank's large value payment system, the RIX system, have the right to automatically borrow as much as they need against collateral. Other financial institutions can in turn borrow from these banks. The total stock of securities which can be pledged with the Riksbank is relatively stable and has during the last four years amounted to SEK 1700 billion. The banking sector's cash holdings plus their stock of securities, which are eligible to be used as collateral in the payment system has averaged about SEK 200 billion during the last two years. Ordinarily, banks use securities worth about SEK 50 billion pledged at the Riksbank to obtain intraday credit in the RIX system.

The Riksbank has opened channels of communication with central banks in those countries where Swedish banks have branches or subsidiaries. This will facilitate the provision of liquidity to these entities should year 2000 related infrastructure problems make it difficult for the Swedish bank to provide liquidity.

## THE SWEDISH FINANCIAL SECTOR'S PREPARATIONS

In its report to the government on September 30, 1999, Finansinspektionen, the Swedish financial supervisory authority, concluded that preparations for the millennium transition in the financial institution have progressed satisfactorily during the year and therefore it is not probable that the financial sector will experience serious disruptions as a result of the millennium transition. Finansinspektionen received a government mandate to monitor the preparations of the financial sector in June 1998. Finansinspektionen have focused on two groups of financial institutions. The first group consists of 15 prioritised institutions, of which 6 are insurance groups, 5 are bank groups and 4 are stock exchanges, clearing houses or payment processing institutions. The second group consists of the institutions deemed to have a moderate impact on the financial system in the context of the millennium transition. Finansinspektionen's monitoring has followed institutions accounting for more than 99% of the market.

Finansinspektionen could confirm in its report that

the prioritised institutions had met supervisory requirements for year 2000 preparations. The institutions with a moderate impact on the financial system were on track to complete their preparations by the end of October.

Contingency planning in the financial institutions was the focus for much of Finansinspektionen's work during the summer and autumn. Institutions were enjoined to comply with supervisory requirements for contingency planning which meet the standards set by the Basel Committee on Banking Supervision and the Joint Year 2000 Council. Finansinspektionen confirms that the prioritised financial institutions have contingency plans meeting the requirements. The institutions with a moderate effect on the financial system have satisfactory contingency plans or will have by the end of October. This judgement is based on the reports of specially appointed auditors who examined the plans as of 30 June. Specifically, the plans are based on an analysis of the year 2000 related risks to the institutions' business activities. Furthermore, the plans include contin-

gency measures to cope with the failure of an internal system, a counterparty or the malfunctioning of basic services such as electricity. Finally all of the plans include a contingency organisation with the personnel necessary for both business and technical matters. What

remains is continued training of personnel and testing of the contingency plans.

Finansinspektionen will keep monitoring the institutions to ensure that nothing happens to affect their Y2K status.

## The millennium transition and retail customers

The public's demand for banknotes during the millennium transition is important for the liquidity in the banking system and the public's confidence in the banking system plays an important role in the decision about how much cash to withdraw. Factual information about the millennium transition and the preparations of the financial sector are vital to the public's confidence in the financial system.

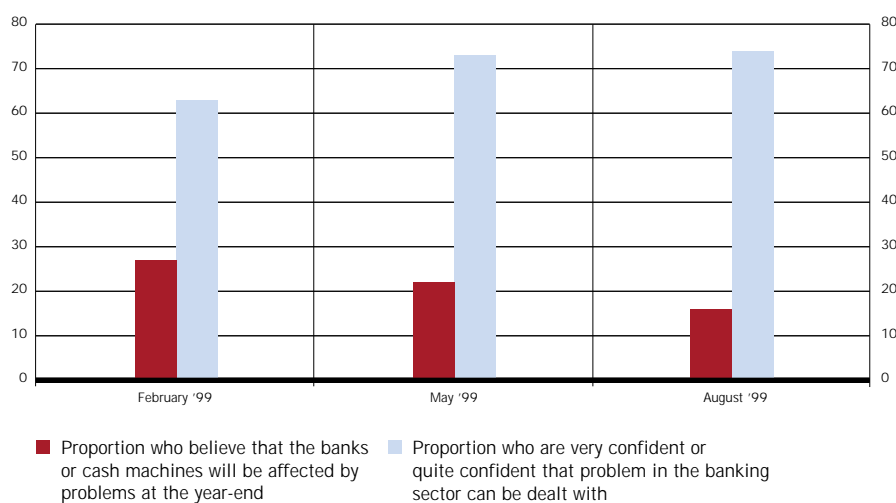
The National Board for Psychological Defense<sup>41</sup> has been investigating the public's information and concerns about the millennium transition throughout 1999. The most recent survey was completed in August. The number, who do not believe that the millennium transition will cause problems for themselves or for society as a whole increased to 41% in

August 1999. The survey provides evidence that a majority of the Swedish public, 74%, has very great or great confidence that the banking system can handle any problems that arise in connection with the transition. At the same time, 16% believed that the banks or ATM's may experience problems during the transition. Confidence has increased steadily during the year (see figure 4:1).

Both the Riksbank and the banks have provided information to help customers understand the nature of computer problems during the millennium transition, banks' preparations and the activities of market authorities. The Riksbank's brochure entitled *Dina pengar försvinner inte vid millennieskiftet* (Your money

41 National Board for Psychological Defense, *Citizens, authorities and the media on Y2K, September 1999.*

**Figure 4:1.**  
The public's attitude to the banking sector in connection with the millennium transition.  
Per cent



Source: National Board for Psychological Defense, *Citizens, authorities and the media on Y2K, September 1999.*

will not disappear at the millennium transition) explains the measures which the banks have taken to safeguard information about customers' accounts and that the common consumer payment methods will function as usual. This information has also been spread in speeches, and articles.

During the critical year-end period the Riksbank and Finansinspektionen, the Swedish financial supervisory authority, intend to keep the public informed and to immediately disclose information about any problems which may arise.

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Nonetheless, the Riksbank and the banking system expect that withdrawals of cash during the 1999 Christmas holiday season may be somewhat higher than previous years. Cash withdrawals are always high around the holidays and this year the buoyant consumption trends together with millennium celebrations should increase the need for cash. All institutions involved in the provision of cash are preparing for such an increase. The responsibility for ensuring that the public has access to bank notes lies with the individual banks.

Providing for an increased withdrawal of cash requires both that the Riksbank have a sufficient supply of notes and coin and that PSAB, the Riksbank's subsidiary, sees that the cash is distributed where it is needed. A reasonable hypothesis is that households may withdraw an additional couple of thousand kronor which means additional withdrawals of about SEK 10 billion. As in the last *Financial Stability Report*, the value of the total supply of bank notes, both those in circulation and those in stock, is SEK 170 billion. This is more than sufficient to cover any increase in withdrawals. The banks' liquid assets are about SEK 200 billion (see previous section) which means that the banks can meet any increase in withdrawals.

Finansinspektionen has monitored the testing and contingency planning in Bankgirot and Postgirot. Both have met regulatory requirements for internal tests, external tests and contingency planning. With these systems and a good supply of bank notes, no serious problems with retail payments are expected.

## Financial markets and the millennium transition

The Swedish financial markets are expected to function as usual around the millennium shift. However, traders have long expected that there will be less trading than a usual year-end. Discussions between the Riksbank and major market participants suggests that they have a realistic view of the types of problems which may arise in conjunction with the millennium transition and are working to insure smooth operations and good liquidity in the markets. One indication that the markets have confidence in the financial sectors preparations for the millennium transition is the fact that the butterfly spreads for the critical period have decreased (see figure 4:2).

Participants in both the foreign exchange markets and the money markets are considering changes to routines and agreements to reduce the stress on clearing and settlement systems. Some simple procedures such as getting paper work done correctly and on time so that no corrections or backlogs need to be handled over the critical period will help to reduce settlement flows. Moreover, participants in the foreign exchange market have reached a consensus to reduce volumes in spot trade during the weeks around the end of the year. A convention has been established for currency based forward agreements which means that contracts entered into during 1999 which ordinarily would have been settled in the beginning of January will be settled on the fourteenth of January. These adaptations will not affect the overall functioning of markets and customers will be able to enter into any transactions, which they choose during this period. In the money market, the



need to maintain market liquidity is paramount. Participants will attempt to reduce settlement volumes while maintaining liquidity in the markets.

For markets to function on a business as usual basis, computer support for the entire transaction chain from striking a deal through settlement must work. It is particularly important that the transactions which the Riksbank uses for monetary policy and for fine tuning liquidity can be carried out. The Riksbank and a group of major market participants have examined the systems which are necessary to carry out each stage in these transactions to determine if additional tests were necessary.<sup>42</sup> This examination showed that all of the vital transactions and computer systems have already been tested or will be tested. Therefore, there is no reason to believe any disruptions should occur in these necessary transactions.

## Contingency planning

There is no reason to expect any significant problems caused by the millennium transition. However, small glitches in computer systems occur from time to time although the public is usually not aware of them. Similar disturbances may well occur over the

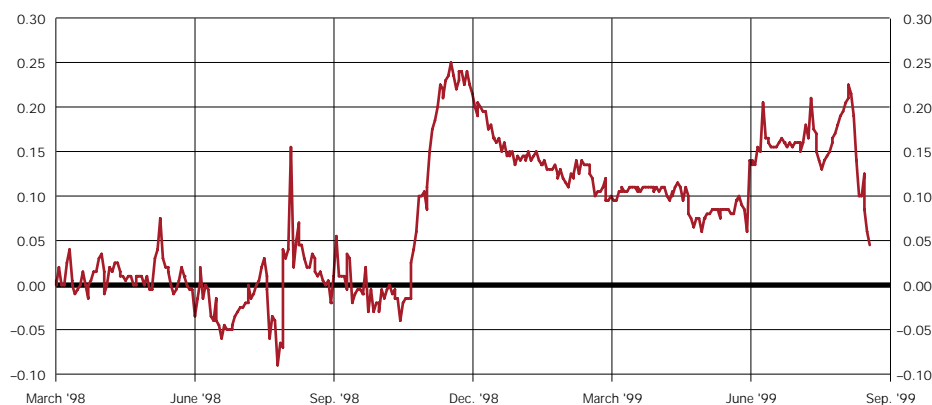
millennium transition. Financial institutions routinely maintain and test contingency plans to manage problems in their computer systems. In connection with the millennium transition, these plans must be extended to allow for simultaneous problems in a number of institutions or in a number of markets as well as problems with public services such as electricity and telephones.

Clearly the functioning of the financial markets is dependent on the operation of telephone lines and electricity. Independent investigations of these sectors carried out by the Year-2000 delegation concluded that the millennium transition should not increase the risk of disturbances. The financial sector should be able to count on fully functioning infrastructure during the transition.

Finansinspektionen appointed special auditors who were required to review the contingency plans at all important financial institutions by 30 June 1999. Finansinspektionen can confirm that all institutions whose malfunctioning would have a significant impact on the financial system will have a contingency plan meeting supervisory requirements by the end of October 1999.

42 See Financial Stability Report 1999:1.

**Figure 4:2.**  
Millennium Butterfly Spread  
in SEK three-month forward  
rates (FRA IMM).  
Interest rate differential in  
percentage points



Note: The spread is calculated as the interest rate on the December 1999 contract minus the average of the rates on the September 1999 and March 2000 contracts.  
Source: Reuters.

For business as usual over the year 2000 transition, it is essential that the large value payment system, the RIX system be able to settle payments and provide liquidity. The goal of the Riksbank's contingency plan is to enable the financial system to provide a necessary level of payment services even if operational problems arise. This means that the Riksbank must be prepared to remedy any problems in the RIX system itself and to smooth over or contain any problems in which may arise member banks.

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The goal of the Riksbank's contingency plan is to enable the financial system to provide a necessary level of payment services even if operational problems arise.

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The contingency plan for the RIX system has been developed to cover all eventualities from failure of a major participant to electricity failures in the Riksbank. Should problems arise, participants will be able to enter payments from dedicated computers run on reserve electricity. In the worst case, clearing will be carried out manually. The Riksbank has also obtained information about the contingency plans of those infrastructure providers, which are essential to the payment system. The banks have also expressed a willingness to pledge a significant portion of their securities stock in the Riksbank over the critical period. This would allow for a supply of buffer liquidity even if the technical infrastructure that supports pledging should not function smoothly at the beginning of the new year.

The Riksbank has a standing contingency plan for handling problems with banks that are members of RIX. This plan is being supplemented to cover the special problems that may arise in connection with Y2K. The current plan specifies the division of responsibilities, channels for the dissemination of information and the decision process in the event of a crisis. These basic working procedures could also be implemented for Y2K problems. However, the current contingency planning assumes that all Riksbank systems will function or can be duplicated at a back-up site. The year 2000 plans cannot make that

assumption. This means that the contingency plan includes routines so that the RIX system can function without computer back-up.

During the autumn, the Riksbank and Finansinspektionen continued work to harmonise their contingency plans. This work included the measures that they would take should problems arise in the financial sector in connection with the changeover. This work will culminate in a final joint contingency exercise in the middle of November.

The Riksbank and Finansinspektionen are co-ordinating an information exchange with financial institutions at critical times during the millennium transition. The results of this exchange will be spread to the general public by organising information to the press at each critical juncture in the transition process.

## International preparations

International preparations for the millennium transition are progressing satisfactorily. Large financial firms with significant international business have made good progress in adapting their systems. This was the conclusion of a meeting of the Joint Year 2000 Council in July 1999. The Joint Year 2000 council co-ordinates and disseminates information about financial market preparations and best practice in year 2000 adaptations among members of the global financial supervisory and central bank community. This group has provided recommendations on testing activities, information contingency planning and supervisory methods for the millennium adaptation.

Many emerging markets exhibit a lower level of preparedness for the millennium switch. However, economies with relatively little computerisation of financial services will be less vulnerable to problems. Moreover, countries with a low level of preparedness tend not to have many links to the international financial markets. Roger W. Ferguson Jr., Chairman of the Joint Year 2000 Council and Member of the Board of Governors of the Federal Reserve System, said in a speech on July 29, 1999 that he

would expect "any international disturbances to be limited in terms of the number of institutions and countries affected." Swedish banks have taken precautions against any effects of year 2000 problems abroad affecting their business in Sweden by examining their business relationships particularly with countries whose preparations are reputed not to be well advanced.

Some analysts suggest that this may mean that banks in emerging markets experience a bigger flight to safety than is expected in developed economies where preparations are well advanced. For this reason developed economies may have an increase in liquidity over the millennium.

Both the Riksbank and Finansinspektionen have an established network of contacts with their counterparts in other countries. This will ensure that information about conditions in those countries around the millennium transition is communicated to the Swedish markets and public.

## Conclusions

Swedish financial institutions finished all testing and adapting of computer systems for the year 2000 before last summer. Finansinspektionen has studied special reports on institutions' contingency planning and concludes that all major Swedish institutions have established plans which meet the recommendations of the Basel Committee on Banking Supervision and the Joint Year 2000 Council.

The financial markets and the general public are well aware of the types of problems that may occur in connection with the millennium transition. Market participants have reached a consensus on mea-

asures to reduce unnecessary settlement and clearing volumes over the critical period. These measures will not affect the market's ability to handle the full range of transactions which counterparts may request; however, they will reduce the stress on vital components of the financial infrastructure during the transition.

Banks in Sweden, which have access to the central bank's large value payment system, the RIX system, have the right to automatically borrow as much as they need against collateral. In as much as these banks have substantial stocks of securities, which can be pledged, liquidity should be available.

The Riksbank is completely prepared for the transition. The RIX system has been fully tested and gives no evidence of any 2000 related weaknesses. This means that the basic payment systems will work without problems. Furthermore, the Riksbank has an adequate supply of cash and streamlined distribution routines to insure that those individuals who choose to withdraw extra cash can do so.

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The Riksbank anticipates that the activities in the Swedish financial system will continue as usual.

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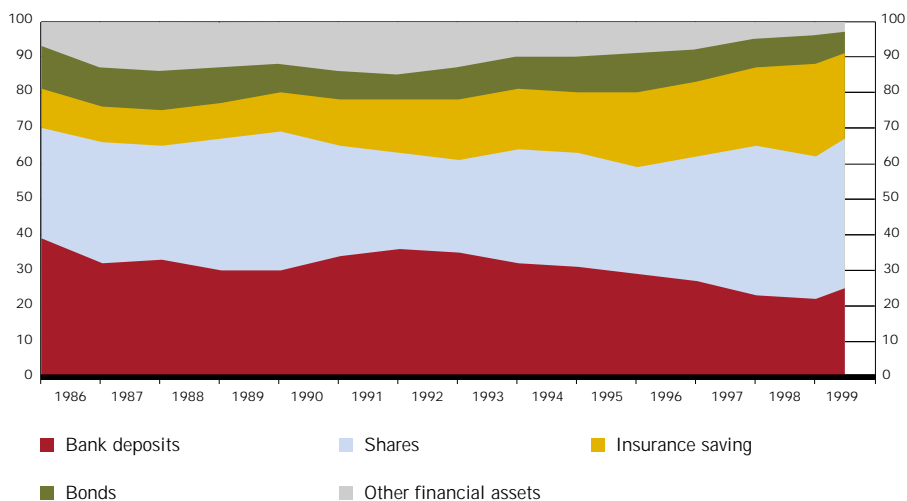
The Riksbank anticipates that there will be no significant problems arising as a result of the millennium transition. Because the adaptations to correct any year 2000 related problems are very complex and all encompassing, it is reasonable to assume that there will be glitches. These may lead to minor disruptions of a limited duration. The responsibility that transactions continue as usual and that the clients have access to the services they demand are the banks. With the reserve routines which financial market participants have in place, the Riksbank is confident that the financial system's business will proceed as usual in Sweden.



## APPENDIX

# Indicators

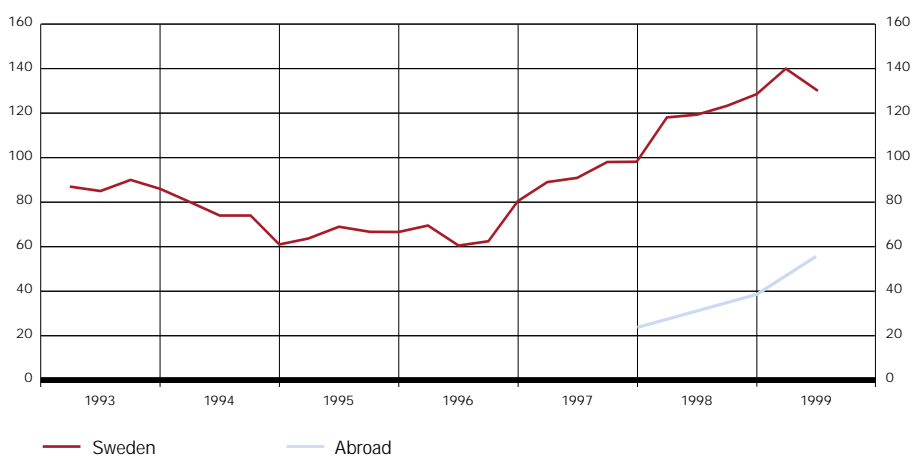
**Figure 1.**  
Households' financial assets.  
Percentage breakdown



Source: Statistics Sweden.

Despite some increase during 1998, bank deposits as a share of households' financial assets have decreased by 14 per cent since 1985 in favour of shares and insurance saving in particular. The increase in 1998 can probably be partly explained by the stock market turbulence during the autumn, which led to a switch to safer bank saving.

**Figure 2.**  
Commercial paper and bonds issued in Sweden and abroad by Swedish non-financial firms, outstanding amounts. SEK billion

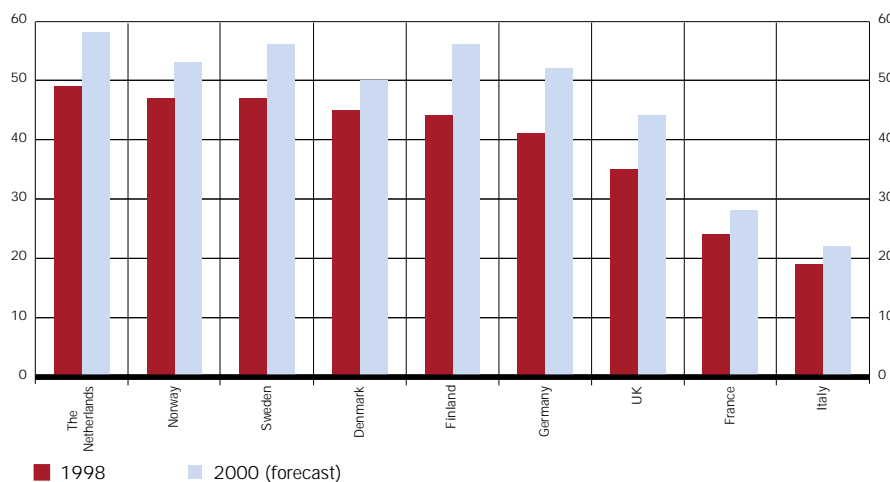


Source: The Riksbank.

The market for corporate bonds and commercial paper has grown both in Sweden and abroad during recent years. The fact that emission volumes remained constant in Sweden in 1999, while growing abroad can be the result of companies' choosing to shift their borrowing abroad. This trend and the decrease in bank deposits as a share of household financial assets (see figure 1) are clear indications of disintermediation.



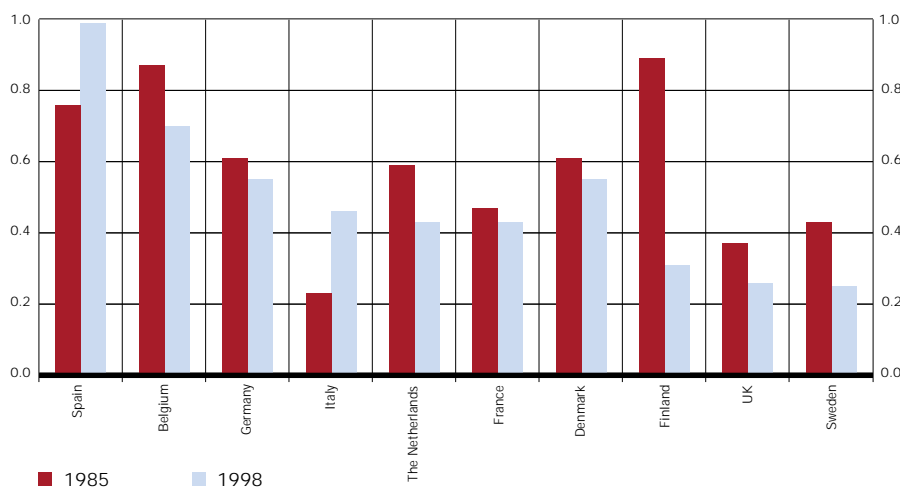
**Figure 3.**  
Proportion of the  
population with a PC at  
home.  
Per cent



Source: Morgan Stanley Dean Witter and Jupiter, "The European internet report".

In comparison with most other European countries, Sweden has a high PC density and the forecast for 2000 indicates an increased proportion of the population with a PC at home. This is important for the spread of internet-based banking services.

**Figure 4.**  
Number of bank branches  
per 1000 inhabitants



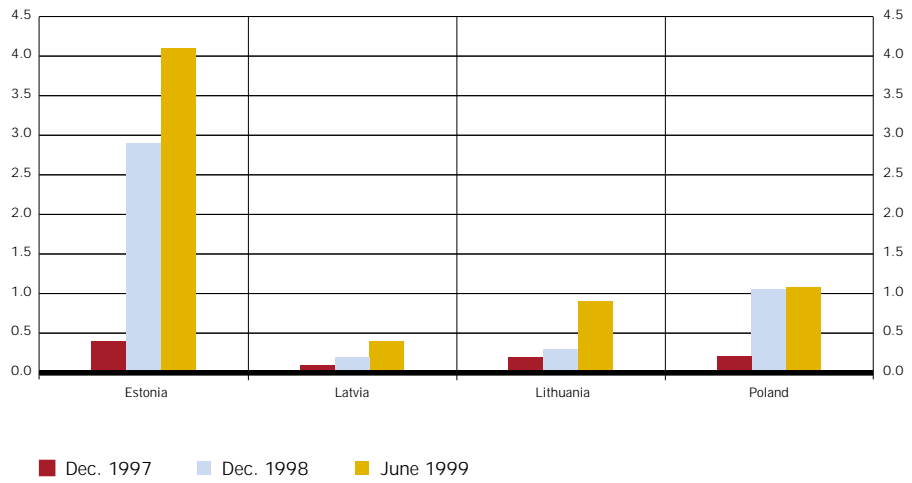
Source: ECB.

An indication that the Swedish banks are relatively far advanced with regard to efficiency improvements and restructuring is the low number of banks per thousand inhabitants.



**Figure 5.**

Swedish banks' gross exposure to the Baltic republics and Poland. Exposure includes cash in foreign currency, shares (including shares in other banks), and interest-bearing securities. SEK Billion

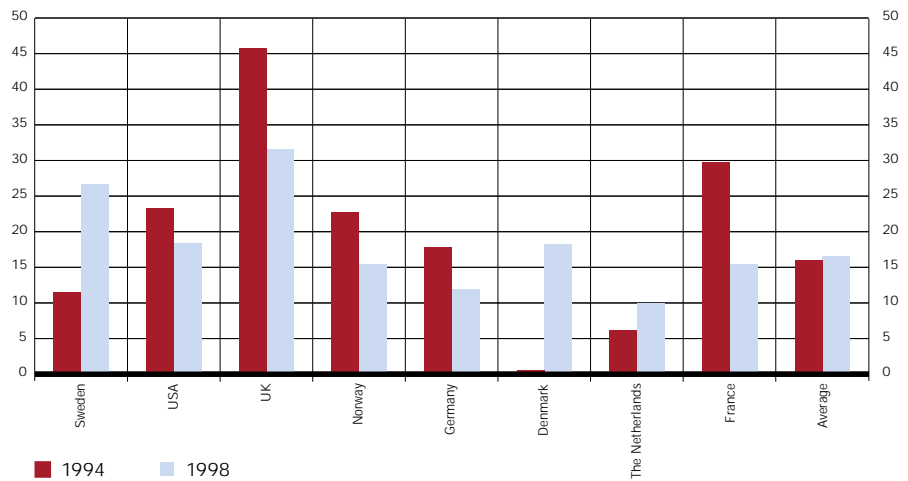


Source: The Riksbank.

Swedish banks' exposures in the Baltic republics are considerably lower than in the Nordic countries although they have increased, especially in Estonia. The same applies to investments by Swedish banks in Poland. It should be mentioned that a large number of Baltic banks have extensive exposures to Russia.

**Figure 6.**

Average return on equity

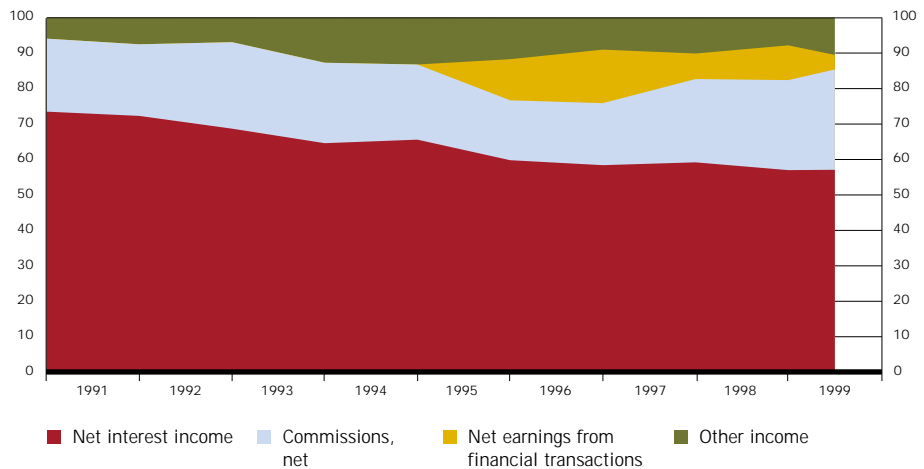


Source: Thompson BankWatch, Bankstat.

In an international comparison of bank profitability, return on equity is seen to be relatively good in Sweden. A contributory cause of good profitability, given the present inflation and interest rate levels and the pressure to change in the industry, is the historically low loan losses.



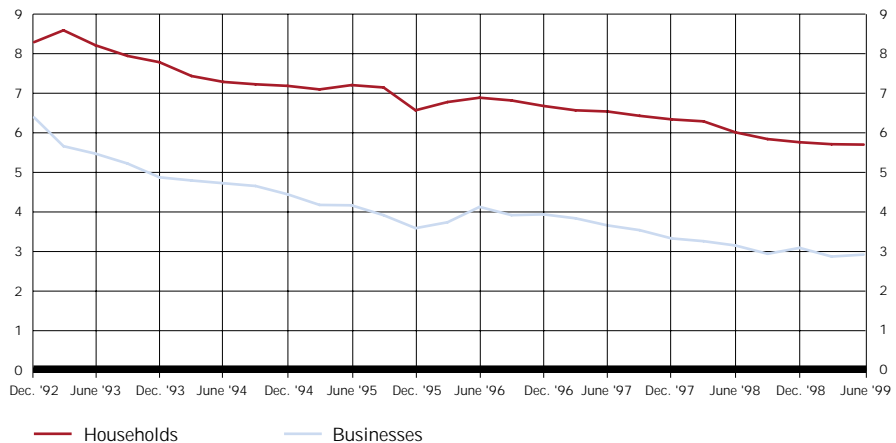
**Figure 7.**  
The income of the major bank groups.  
Percentage breakdown



Source: The Riksbank.

Net interest income as a share of bank income has fallen during recent years although this decrease now seems to have levelled off. A contributory reason for this stabilisation is probably increased deposits during the first two quarters of 1999.

**Figure 8.**  
The difference between the bank lending and deposit rates for households and businesses.  
Percentage points



Source: The Riksbank.

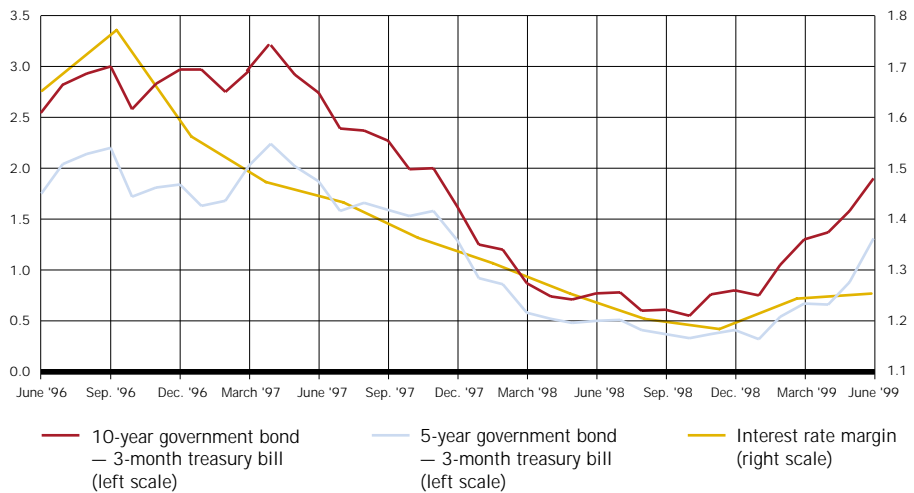
The Riksbank's interest rate analysis. The measurement at the banks only relates to lending and deposits in Swedish kronor and at a variable interest rate. Problem loans, repos and loans on non-customary terms such as loans to group companies are not included. Deposit and lending rates are measured as a weighted average on the last day of the quarter, the treasury bill rate as a weekly average.

The difference between deposit and lending rates provides a good picture of price development in the banks' core activities and is a good indicator of the pressure to change in the industry. After having deteriorated for the past seven years, the margins on deposits and lending now seem to have stabilised.





**Figure 9.**  
The difference between long and short rates and the bank groups' interest rate margin.  
Percentage points

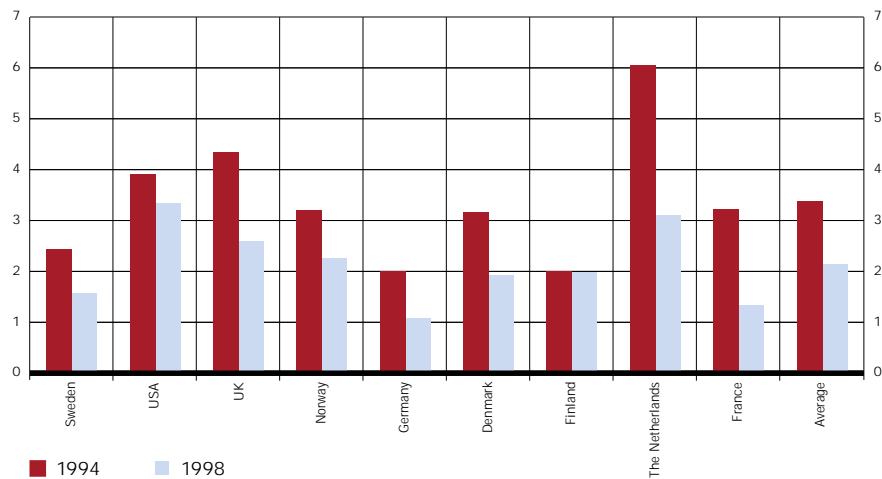


Sources: The banks' annual and quarterly reports and the Riksbank.

Interest margin = interest income in per cent of balance sheet total less interest expense as a percentage of balance sheet totals excluding equity.

The interest rate margin of the bank groups fell continuously between 1996 and 1998, partly due to the reduced difference between long and short interest rates during the period. In the same way, the increased interest rate margin during the first six months of 1999 can depend on the increased difference between long and short interest rates.

**Figure 10.**  
International comparison of adjusted investment margin.  
Per cent



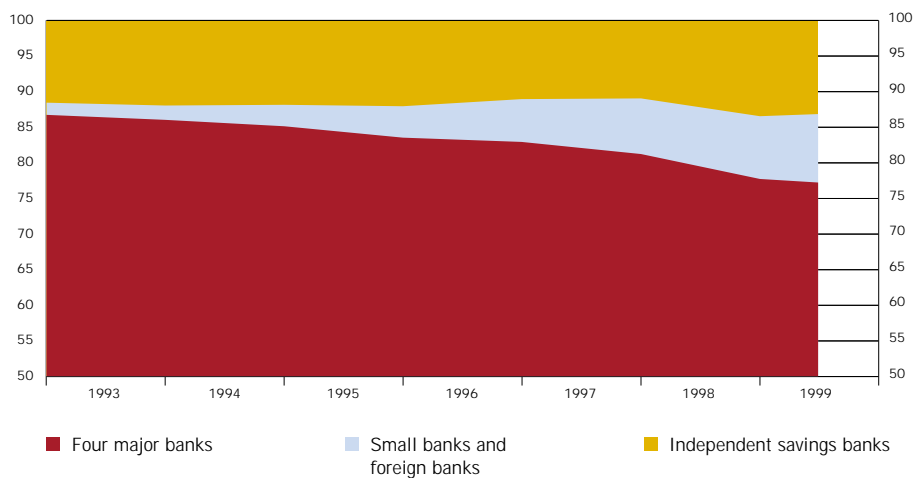
Source: Thompson BankWatch, Bankstat.

Adjusted investment margin = net interest income divided by interest bearing assets.

A comparison with foreign banks shows that the Swedish banks' investment margins are relatively low, which can be an indication of good competition, despite the relatively high concentration.



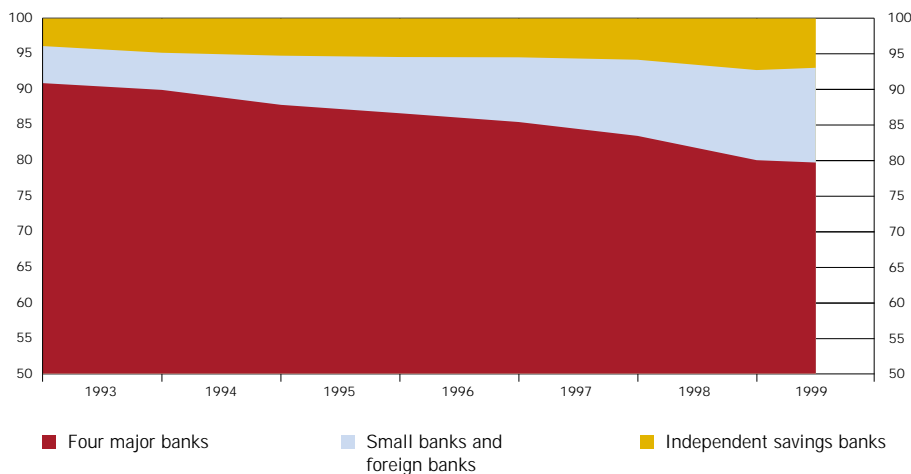
**Figure 11.**  
Deposits from households  
Market shares in per cent



Source: The Riksbank.

The banks have lost market shares on the deposit side above all to small and foreign banks. The latter's aggregate proportion of household deposits has increased by 9.5 per cent since 1992.

**Figure 12.**  
Lending from banks to  
households and businesses.  
Market shares in per cent

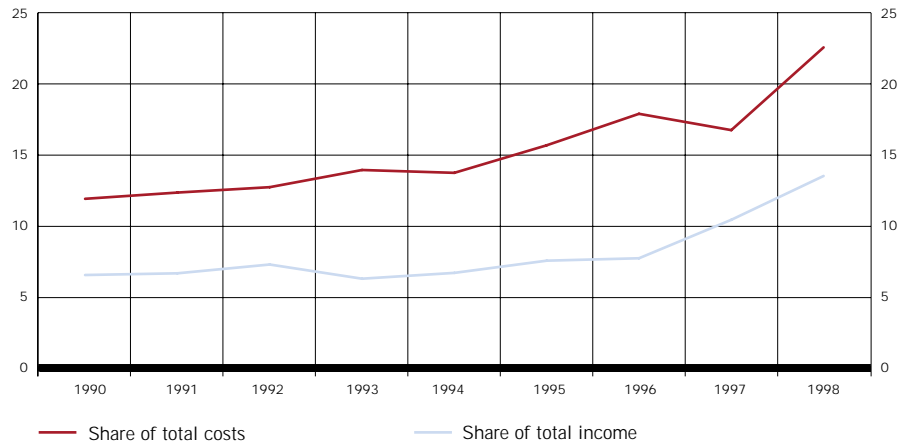


Source: The Riksbank.

The four major banks' market shares of bank lending to businesses and households fell by around 12 per cent between 1992 and the first six months of 1999, primarily in favour of small and foreign banks. This trend has probably contributed to the banks' investment in a broader range of products and an attempt to make activities effective by consolidation and investment in new technology.



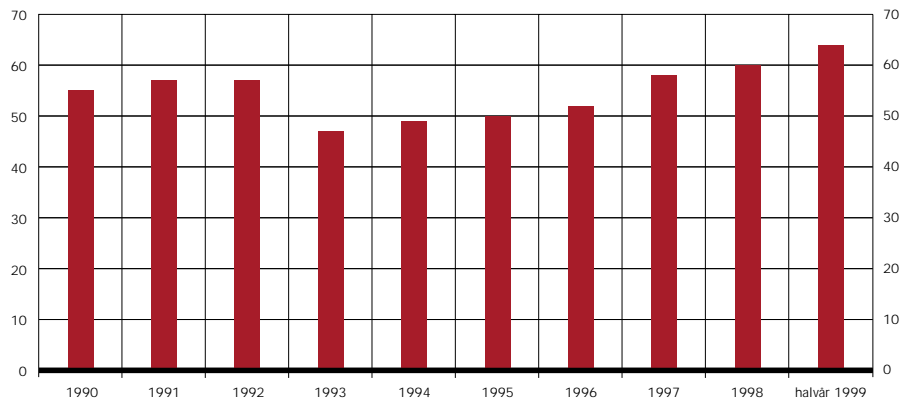
**Figure 13.**  
The bank groups' \* IT costs, share of total costs and total income respectively.  
Per cent



\* Based on three bank groups from 1990 to 1996 and four bank groups from 1997 to 1998.  
Source: The Riksbank.

Investments in IT have contributed to the negative development of costs in Swedish banks although they may contribute to profits from increased efficiency and a more positive development of costs in the longer run. Some IT investments are probably also related to the millennium transition.

**Figure 14.**  
Costs before loan losses in proportion to income in the major bank groups.  
Per cent

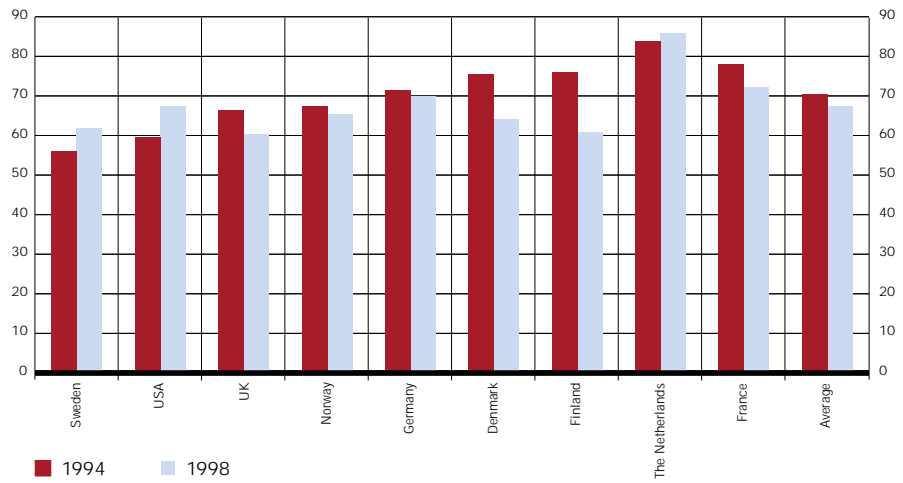


Sources: The banks' annual and quarterly reports and the Riksbank.

Costs before loan losses in proportion to income have increased since 1993 and also increased during the first six months of 1999. Important factors underlying the development of costs are increased investments in IT and increasing merger costs deriving from the extensive consolidation in recent years.



**Figure 15.**  
International comparison  
of C/I ratios.  
Per cent

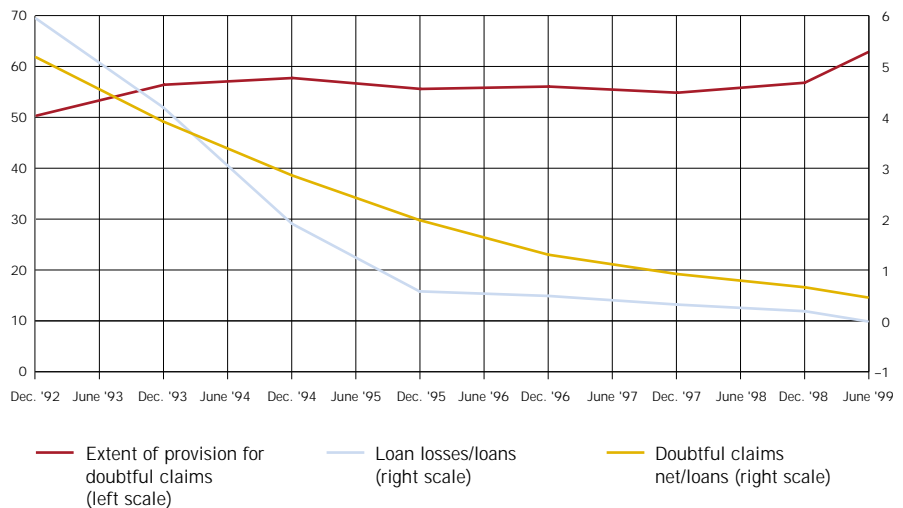


Source: Thompson BankWatch, Bankstat.

C/I ratio = ratio of total operating costs excluding taxes and loan losses to total income.

Swedish bank costs have developed negatively in recent years. Despite this, Sweden's C/I ratio is comparatively good and investments in IT will probably eventually push up costs in foreign banks as well.

**Figure 16.**  
Provisioning ratio for  
doubtful claims, loan  
losses and doubtful claims,  
net in proportion to  
lending.  
Per cent



Sources: The banks' annual and quarterly reports and the Riksbank.

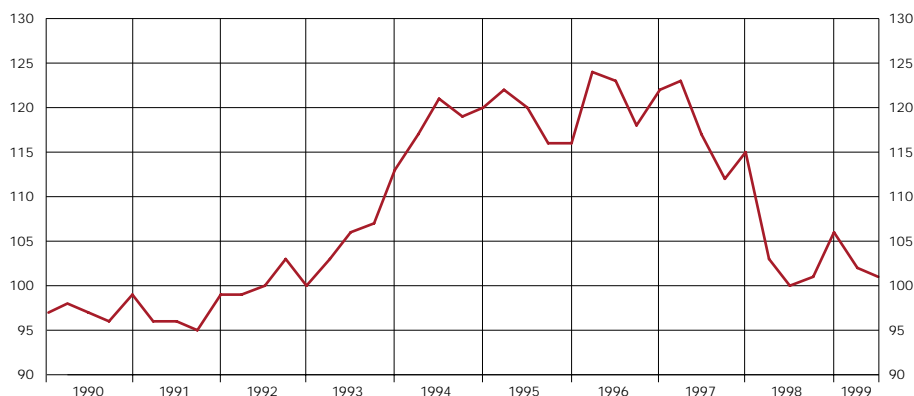
Provisioning ratio for doubtful claims = provisions for anticipated loan losses divided by gross doubtful claims.

A doubtful claim is a claim for which interest repayment or a debit balance is more than 60 days overdue or where other circumstances give rise to uncertainty about repayment and the value of any collateral does not cover the principal and interest due with an adequate margin.

The development of the banks' loan portfolios is at present very positive which can be related to the present favourable economic development.



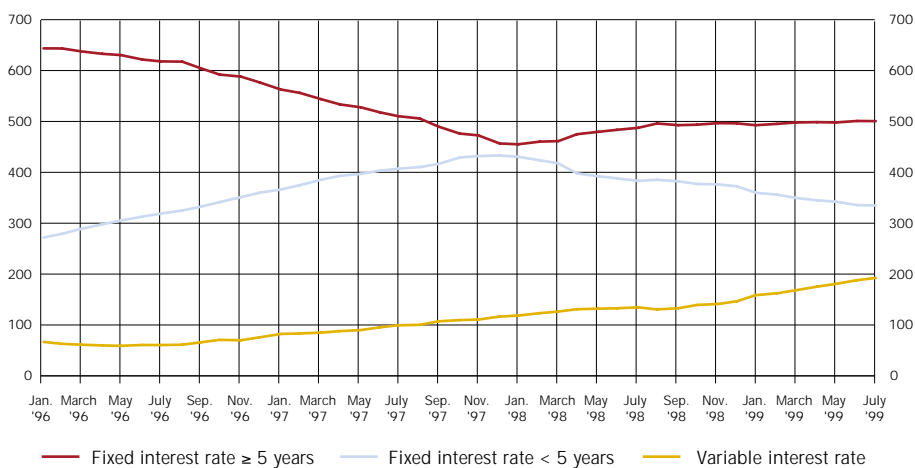
**Figure 17.**  
The banks' deposits as a share of loans.  
Per cent



Source: The Riksbank.

The positive state of the economy has meant a considerable increase in lending and a reduction in new saving. Together with a shift of savings to forms of savings outside the banks' balance sheets, this has meant that deposits have tended to decrease in importance in the banks' activities in relation to lending. The falling ratio between deposits and loans indicates a greater need of more transitory forms of financing than deposits in the Swedish bank system.

**Figure 18.**  
Mortgage institutions' loans broken down according to original fixed interest term.  
SEK Billion

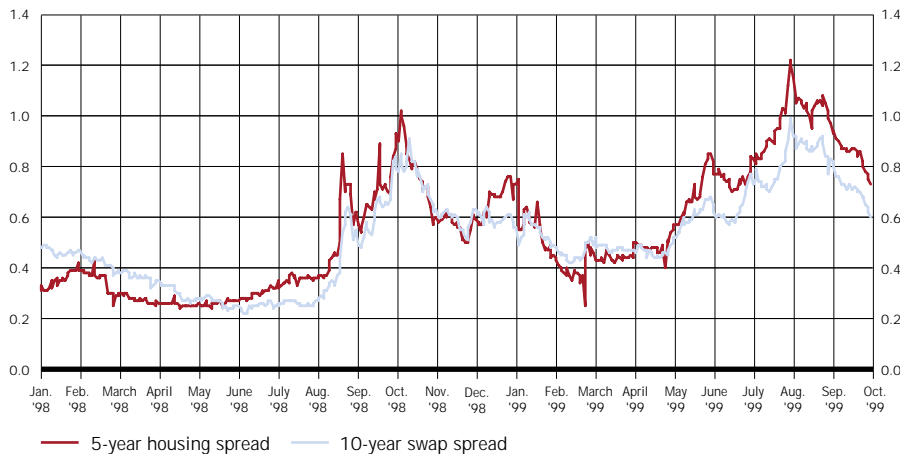


Source: The Riksbank.

The fall in interest rates in recent years has led to an increasing proportion of new lending by the mortgage institutions taking place at a variable interest rate. In the event of large quantities of loans being converted to fixed interest rates, the mortgage institutions will require more long financing than can be obtained from the banks. This will therefore have to take place as a bond loan. Although the problem should not be overestimated, there is a re-financing risk for the bank groups.



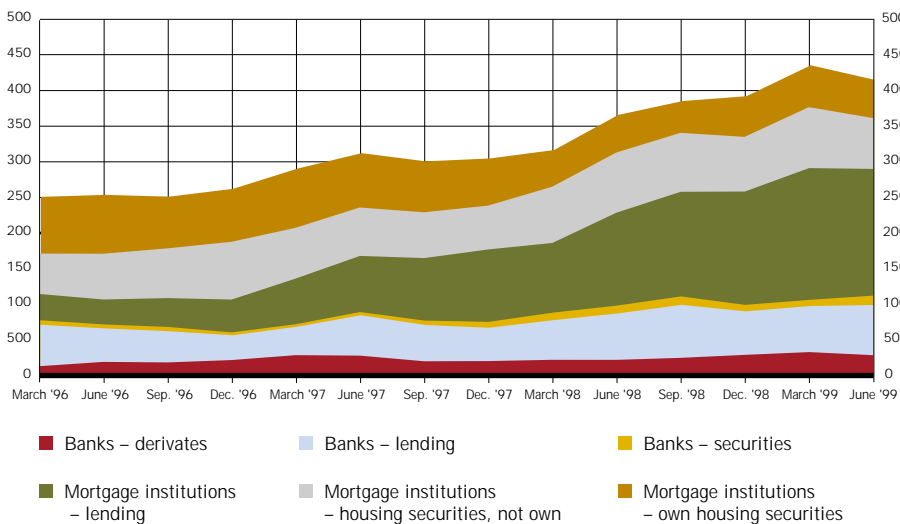
**Figure 19.**  
The difference between the interest rate on 5-year government bonds and the rate on housing bonds (Stadshypotek) and 10-year swap spread. Percentage points



Sources: Stadshypotek and the Riksbank.

Recently, liquidity in the swap and the market for mortgage institution bonds has declined. This is made clear by a greater difference between risk-free interest rates and the interest rates in these markets. This is due to large extent to the millennium transition.

**Figure 20.**  
Exposures for the four big banks to Swedish banks and mortgage institutions. SEK Billion

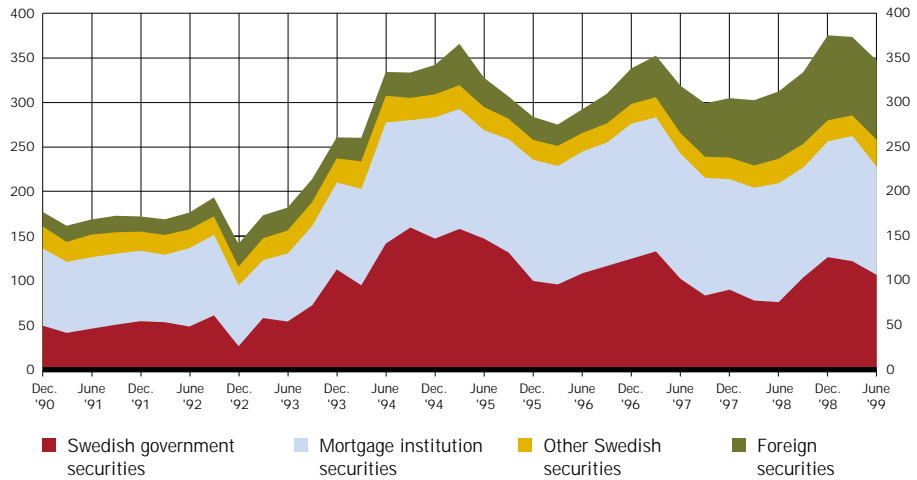


Source: The Riksbank.

The credit exposures between Swedish banks consist largely of credits intended to even out differences in liquidity between the banks. The increase in exposure to mortgage institutions is worthy of note. Lending to mortgage institutions has almost quadrupled in the past three years. The explanation for this is that the housing institutions obtain finance where it is cheapest, and it is at time cheaper to obtain finance by promissory note borrowing instead of issuing bonds, particularly if the banks have a surplus of cheap financing as deposits. The banks' large exposures to other Swedish banks and housing credit institutions entails that there is a considerable risk for contagion effects in the Swedish financial system.



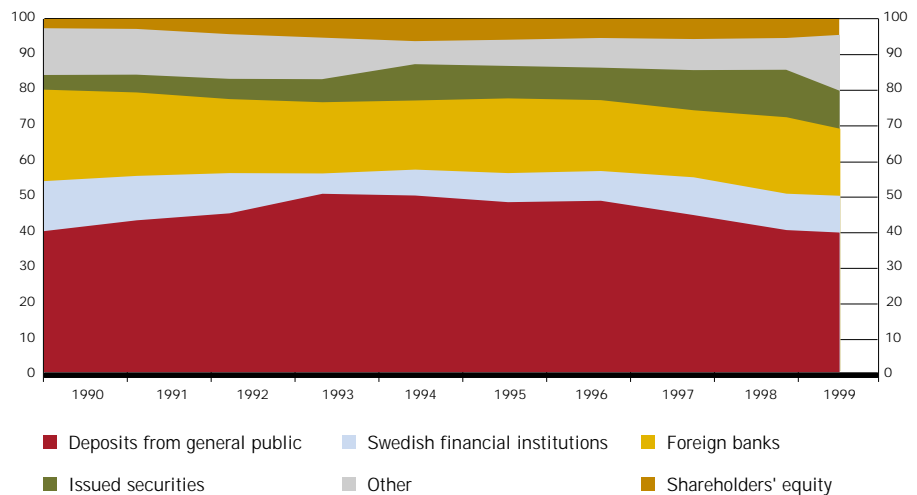
**Figure 21.**  
The four major banks' securities holding.  
SEK Billion



Source: The Riksbank.

The banks' holdings of securities increased greatly in the mid-1990s, probably due to a surplus of deposits at the banks and to the growing repo market. In recent years, primarily foreign securities holdings have increased.

**Figure 22.**  
The major banks' liabilities.  
Percentage breakdown



Source: The Riksbank.

The switch to new forms of savings and increased competition for deposits have resulted in a reduction of the share of traditional deposits in the big banks' financing. Deposits are a comparatively stable and cheap source of financing so that the large share of market financing can lead to increased sensitivity to liquidity disturbances in the financial system.



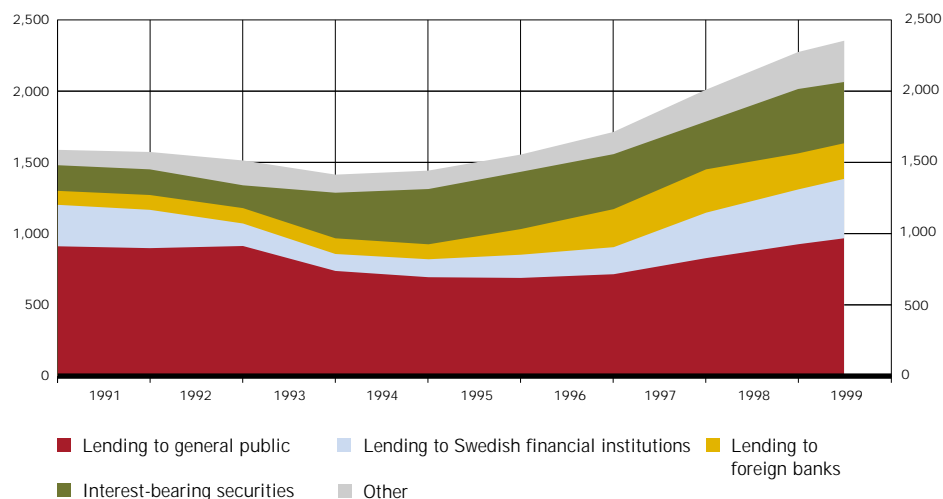


**Table 1.**  
Swedish-owned banks in  
the Nordic countries and  
Baltic republics.  
Wholly-owned banks  
unless otherwise stated

	Finland	Norway	Denmark	Estonia	Latvia	Poland
<i>S E B</i>	Gyllenberg		Codan Bank, Codan Link (49%) Amagerbanken (16%)	Eesti Uhispank (50.15%)	Latvijas Unibanka (50.5%)	
<i>Handels- banken</i>		Bergensbank Oslobanken Oslo Handelsbank Stavanger Bank		Aktoris		
<i>Merita- Nordbanken</i>				Estonian Industrial Leasing (80%) *	Latvian Industrial Leasing (66%) Investment Bank of Latvia (70%)	Bank Kommunaly (49.9%)
<i>Förenings- Sparbanken</i>	Aktia (25%)	Spare Bank 1 (25%)		Hansapank (49.98%)		Bank Handlowy (6%)

\* Owned by Merita Finans.  
Source: The banks.

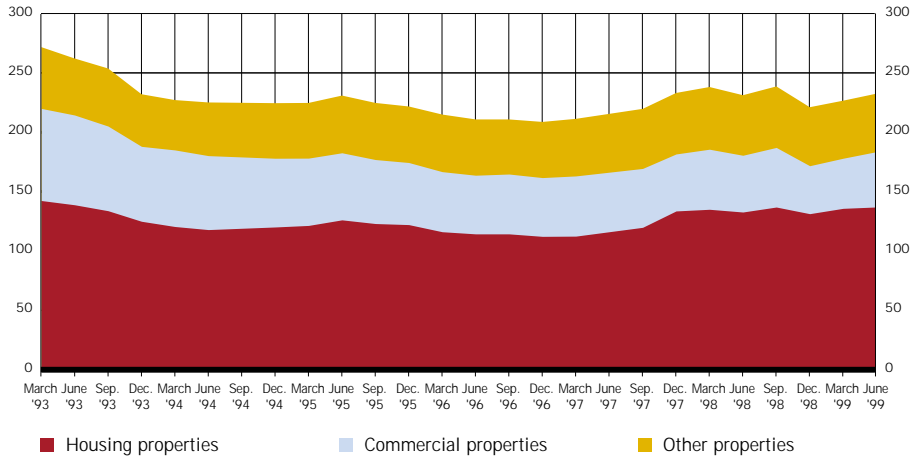
**Figure 23.**  
Assets of the major banks.  
SEK Billion



Source: The Riksbank.

The banks' aggregate balance sheet has expanded during the late 1990s. It is primarily the holding of securities and lending to financial companies that have increased, and this has led to an increased exposure to counterparty and settlement risks.

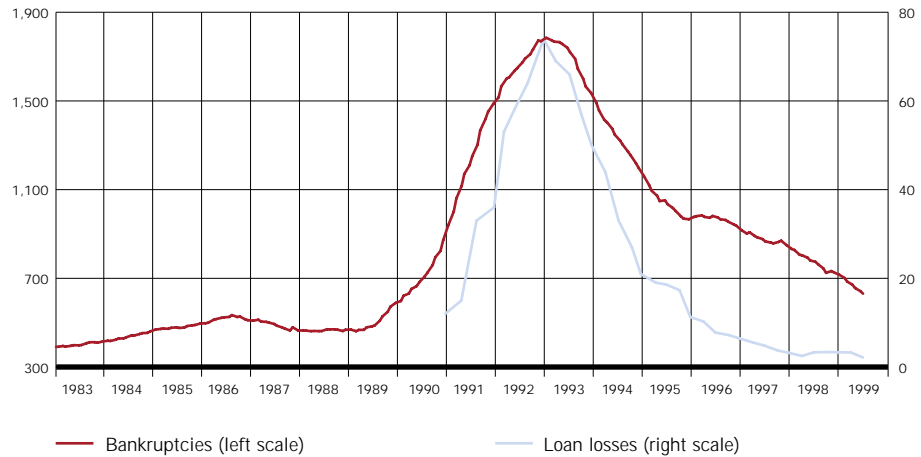
**Figure 24.**  
Banks' lending against collateral in properties.  
SEK Billion



Sources: Finansinspektionen and the Riksbank.

A decline in bank lending with collateral in properties was noted in the last report. However, this seems to have been a temporary effect and loans with collateral in properties are again increasing, which can be due to a part of lending from the housing credit institutions shifting to the banks.

**Figure 25.**  
Loan losses in major bank groups and company bankruptcies.  
SEK Billion and moving average of number respectively

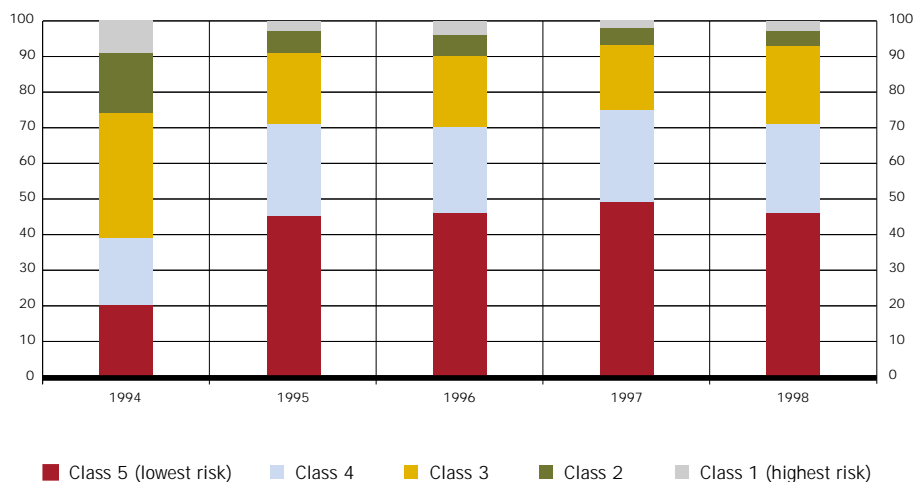


Sources: Statistics Sweden and the Riksbank.

Bankruptcies in the corporate sector lead to problems for the banks as they cause loan losses. Recent developments show a falling trend for bankruptcies and loan losses. The favourable development in the Swedish economy indicates a low bankruptcy rate during the next few years.



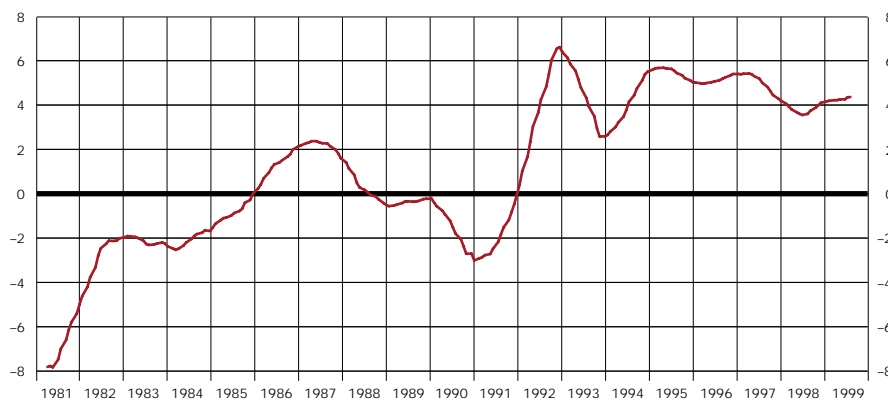
**Figure 26.**  
The proportion of companies in different risk classes



Source: Business & Credit Information Agency (UC).

Some increases in the proportion of companies in the highest risk classes can be noted. However, the risk level is still low and it is too early to talk in terms of a trend change towards higher risk in the corporate sector.

**Figure 27.**  
Housing interest rate adjusted for taxes and inflation.  
Per cent

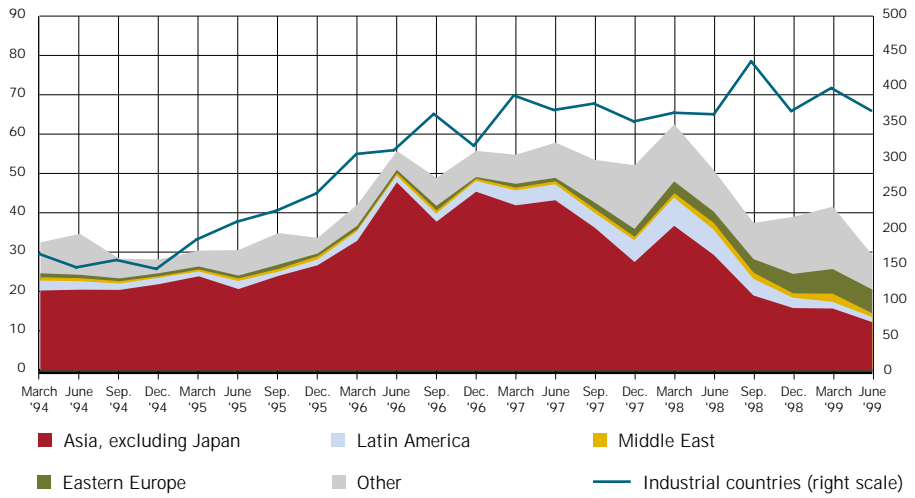


Note. The calculation of the real interest rate on mortgage loans has been simplified somewhat by using the interest rate on a five-year housing loan adjusted for tax minus the annual percentage change in inflation (CPI).  
Sources: Statistics Sweden and the Riksbank.

The cost to households for borrowing consists of the real interest rate adjusted for tax. At the end of the 1980s, very high rates of increase in lending to households were noted, which can be compared with the slower increase in lending which is taking place at present. The period at the end of the 1980s was characterised by a very low real rate of interest which, taking into consideration tax effects, was often even negative. At present the tax-adjusted real housing interest rate is instead relatively high.



**Figure 28.**  
The banks' exposure to foreign banks, breakdown by region.  
SEK Billion



Source: The Riksbank.

The exposure of Swedish banks to foreign banks increased during the mid-1990s as a result of which the Swedish financial system became more vulnerable to international financial problems. After the turbulence in the international financial markets in 1998, exposures to the banks in more risky areas have decreased.