SVERIGES RIKSBANK

Financial Stability Report

Sveriges Riksbank

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Foreword

The risks in the financial system are affected to a large degree by economic developments as a whole. The bank crises that have arisen at various points in time around the world have often been triggered or reinforced by a rapid deterioration in the general economic climate. This deterioration in the economy affects borrowers' ability to pay their debts, which in turn can affect banks in the form of loan losses. In earlier Financial Stability Reports, macroeconomic developments have mainly been discussed from this *loan loss perspective*. However, the development of the real economy does not only influence loan losses, it also affects the banks and the rest of the financial system in a number of other ways. For example, economic growth is closely related to the general development of the stock exchange, which in turn has repercussions for banks' commission income.

A new element in this spring 2001 report is that the starting-point for the assessments concerns macroeconomic developments and the external factors that could influence the risks in the financial system. On this basis, there is a discussion of how evidently negative deviations from the usual economic forecasts could affect the banks' most important borrower categories – the household, corporate and commercial property sectors.

The risks in the banking system are also affected by other factors than macroeconomic developments. Profitability, risk taking and financial resistance to disturbances are also affected by the banks' own choice of strategy and their business decisions. Developments in the banking sector are characterised by a strong pressure for change. This has been expressed, for instance, in the wave of bank mergers that can currently be observed in the Nordic countries and elsewhere.

The report concludes with three special, in-depth sections. The first describes the dependence of the banks' income on the business cycle and how the regulations relate to this. The second section illustrates a couple of topical examples of operational incidents – one at Nordbanken, the other at the Riksbank. The third section contains an account of the work on international standards for the financial system.

Stockholm, May 2001
Urban Bäckström
Governor of Sveriges Riksbank

Summary and conclusions

The banking sector appears well-equipped to manage the effects that could ensue from a general economic slowdown. It should also be able to manage a more serious decline in economic activity, if this were to unexpectedly materialise.

The Riksbank, in common with many other analysts, expects to see a slight economic slowdown in the near future. The banks and the lenders to which they are exposed should be able to manage this slowdown. However, from a stability perspective, it is necessary to also take into account a more pessimistic economic scenario. It is only in the event of a more severe or prolonged downturn in the economy that more serious problems can be expected to rise, which could threaten the banks' financial position.

If one makes a comparison with developments in the USA, one can conclude that both the economic slowdown and fall in share prices in Sweden occurred at an earlier phase in the economic cycle, where neither corporate investment, household sector indebtedness, nor the financial savings deficit had yet grown to significant levels. This indicates that Sweden could enter a potential economic slowdown with an initial situation that is more favourable in many aspects than that in the USA.

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There does not appear to be a risk of loan losses among households substantial enough to cause concern over financial stability, even in a very unfavourable development of the economy. This assessment is supported mainly by the low interest rate costs in relation to disposable income and the fact that indebtedness has not been built up to levels that appear particularly high in relation to the situation in the crisis of the 1990s. It would probably require a much more substantial fall in disposable income or a considerable rise in interest rates to cause widespread payment problems in the household sector.

Borrowing by non-financial companies is increasing in total, both within and outside of the Swedish banking sector. However, the corporate sector's borrowing ratio is relatively low, at least compared with the situation prior to the last crisis. Based on the main scenario for macroeconomic developments stated in the Riksbank's March 2001 Inflation Report, it appears unlikely that the number of bankruptcies will increase dramatically. A more negative outcome could lead to an increased number of company bankruptcies,

with markedly increased loan losses for the banks as a result. According to the Riksbank's assessment, however, a prolonged and severe decline in the economy would be required before this had a serious impact on the banks.

The telecommunications sector, which comprises a substantial part of Swedish trade and industry, has become the object of considerable attention recently. The fall in share prices that has affected many telecom companies indicates that the credit risk in the telecom sector has increased. However, the major banks' exposure to this sector is fairly modest (between 1.5 and 2 per cent of their total lending). This means that any further decline in telecom companies' ability to pay their debts would not comprise a serious threat to stability.

However, compared with the years immediately prior to the outbreak of the property crisis in 1990, prices have developed more in line with rent increases.

Last year the banks' lending against collateral in property increased by approximately 20 per cent, which must be regarded as a relatively large amount. Both prices and rent levels for commercial property in metropolitan areas have increased during 2000. Compared with the years immediately prior to the outbreak of the property crisis in 1990, however, prices have developed in much better balance with rent increases. Today's prices for commercial property comprise in real terms approximately two-thirds of the corresponding level at the time of the property crisis. At the same time, today's rents for commercial property are at a real level of around 14 per cent higher than was noted in 1990.

The gross investment ratio in property and the number of building permits granted indicate that activity on the property market is lagging behind developments in the rest of the economy. The increase in investment in property thus risks occurring at a period when the economic climate is weakened. The financial position of real estate companies is relatively stable, although the level of indebtedness has risen slightly. An economic slowdown will probably affect rent levels for market rents on commercial properties, which in turn may weaken the real estate companies' financial position. The low investment ratio in the property sector implies, however, that there will be no major surplus in the supply of business premises within the nearest future. In an economic slowdown this would probably contribute to dampen a fall in property prices.

The major Swedish banks showed a strong development in profits during 2000, with greatly improved net commission income, a continued low level of loan losses and slightly increasing net interest income. The total return on capital employed after tax was approximately 15 per cent, which is slightly lower than the average for the last five-year period. Given the continued uncertainty regarding developments on the stock exchange, with lower index levels, reduced trading and lower activity in financial advisory services, the prospects of the banks achieving equally positive results this year are less good. A general economic slowdown with a subdued growth in lending and probably slightly higher loan losses reinforces this assessment.

A more dramatic slowdown in the economy, combined with continued falls on the stock exchanges, would probably lead to a greater decline in income. This type of scenario would lead to a substantial increase in loan losses, mainly attributable to the corporate sector. On the basis of today's low level of loan losses, however, it seems unlikely that they would increase to an extent where they comprised serious consequences for the major banks.

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All in all, the financial strength in the major banks is currently satisfactory, even taking into account the risk of a more severe economic downturn occurring. Capital adequacy among the major banks amounted to an average of 9.6 per cent in March 2001. The Tier 1 capital ratio amounted to 6.5 per cent at the same time and has remained largely unchanged for the past three years, disregarding a couple of temporary fluctuations in connection with large cash acquisitions.

Since 1999 the Riksbank has gathered in statistics every quarter regarding the counterparty and settlement exposures arising in the banks' trading in financial instruments and in foreign exchange transactions. According to these statistics, exposures appear to have increased slightly during 2000. The banks' exposures are mainly towards counterparties with a good credit rating. The concentration towards individual counterparties has declined slightly, but there are still considerable concentrations between the banks.

The Riksbank's assessment on the basis of the reported exposures is that the risk of spread effects in the banking system is moderate. However, it would be desirable to have reduced concentrations, with reduced systemic risk as a result, particularly if the number of major Swedish banks were to decrease further in the near future.

Liquidity problems could arise in banks for different reasons, e.g. forecast errors or disturbances in computer systems. Besides that, banks can indirectly be troubled by lack of liquidity in important markets. The most serious problems arise if a bank experiences shortage of liquidity as a consequence of real, or perceived, solidity problems. In such cases the bank's financing could very quickly be withdrawn, with a potential default as a consequence. Besides situations when solidity problems are also present, the Riksbank's assessment is that the risk of liquidity problems forcing a major Swedish bank into default is relatively slight.

The computer problems that occurred in the Riksbank's RIX payment system in November and in Nordbanken in December are examples of *operational incidents*. Neither of these incidents had serious resulting effects. Nevertheless, they provided a clear illustration of the vulnerability of integrated systems with many users. The risks connected with increased dependence on certain software types and the suppliers who provide them became particularly evident. It can be concluded that if several institutes are dependent on the same software programs, there are considerable systemic risks, which would not normally be the case with operational risks.

The report also discusses the dependence on the economic cycle

of the banks' profits and the effects that could arise from the fact that this is not taken into account when designing regulations for banks. The Basel Committee's proposal for new capital adequacy regulations involves relating the capital adequacy requirement more directly to the underlying risks. This should contribute to sounder risk-taking by the banks, and thus lead to increased financial stability. However, there are elements in the proposed wording of the regulations that have been questioned, primarily the difficulty in finding forward-looking risk assessment methods. This could give rise to a credit crunch during an economic downturn and thus further reinforce a negative economic cycle. Such effects could, partly, be managed within the framework of the Basel Accord's second pillar, on qualitative supervision. In addition, there may be reason to allow and to consider measures to increase transparency in the banks' exposures in combination with this.

THE RIKSBANK'S ANALYSIS OF FINANCIAL STABILITY

In addition to the objective of maintaining price stability, the Riksbank also has the task of promoting a safe and efficient payment system. The latter function is explained by the strategic importance of central banks for the various functions within a country's payment system. Apart from issuing banknotes and coins, it is also usual that central banks establish a system to facilitate large payments between the banks, i.e. acts as a kind of bank for the banks. In Sweden the Riksbank is both owner and operator of *RIX* , which is the system used for clearing and settlement of payments between the Swedish banks. The banks taking part in the *RIX system* have the opportunity to deposit or loan (against collateral in securities) money overnight from the Riksbank at special, predetermined conditions. The Riksbank establishes the terms for using these deposit and lending facilities so that the banks have an incentive to loan from one another before making use of the opportunity to borrow from the Riksbank. As the terms state the banks' alternative cost for intraday loans, they affect in practice the level of the market rate for intraday credit. The intraday rate in turn affects the interest rates applied to the general public. By adapting the terms for its deposit and lending facility, the Riksbank is thus able to steer the intraday rate so that it comes close to the Riksbank's steering interest rate, the repo rate. The impact of the Riksbank's monetary policy operations on the national economy as a whole can thereby be greatly strengthened; the leverage effect of monetary policy is increased.

The fact that the Riksbank operates a system for payments between banks and that the interbank market is also utilised in implementing monetary policy means that it is in the interests of the Riksbank that the payment system should function well and that the banks participating in it are stable. In addition, there is a more fundamental interest to society to have a stable payment system.

Many functions in the payment system comprise vital parts of the social infrastructure. Payments are a central element in all economic activity. Registration, clearing and settlement of securities transactions are also examples of functions in the payment system that currently comprise important parts of the financial infrastructure. It is essential to society that payments can be executed for the same reasons that it is important that roads, and the electricity and telephone networks function. A breakdown in a vital function of the payment system would entail large efficiency losses in the economy, causing potentially long-last-

ing damage in the form of poorer growth and lower employment.

The deposit accounts at the banks are central to the payment system, as important payment services are implemented in the form of transfers between accounts. The banks thereby play a key role in the payment system and a crisis in the banking system could have a serious effect on the payment system's capacity to function. Stability in the banking sector is in turn dependent on stability in the financial system as a whole.

While a bank can be affected by problems in another company within the same group, the contagion risks do not stop there. The financial system is distinguished by a strong mutual dependence between the different parts of the system, which entails that impulses and disturbances from one part of the system can be rapidly transmitted throughout the entire finance market. If a financial institute suffers an acute financial crisis, there is thus a risk that the crisis will also spread to other institutes. This type of domino effect can arise, for instance, as the result of financial companies having claims on one another, but also because *expectations* of financial problems tend to be contagious. These risks that can cause contagion effects throughout the entire financial system are usually termed *systemic risks*.

Individual players on the financial markets usually have an incentive to assess and where appropriate to protect themselves against risks to their own operations. However, systemic risks cover not only the individual operations, they also include costs for other institutes and for society as a whole. The private incentives to avoid risks connected with such negative *externalities* are not sufficient, from the point of view of society. The occurrence of systemic risks thus constitutes an important motive for the government to exercise supervision over and have special laws and regulations for companies operating in the financial sector. Systemic risks are consequently of central importance in the Riksbank's task of promoting a safe and efficient payment system.

At the time of the financial crisis at the beginning of the 1990s, the banking system was seriously threatened. The government was forced to intervene at that point and grant a general guarantee to the banks' creditors. This meant that confidence in the Swedish banks was restored and a breakdown of the financial system was avoided. The most important reason for the success of the rescue operation was that political consensus could be reached quickly on strong measures to safeguard the stability of the system.

One fundamental lesson learnt from the banking crisis was the importance of having a good crisis manage-

ment system in readiness. This type of system includes well-prepared routines and processed contacts between the authorities concerned – primarily the Ministry of Finance, the Financial Supervisory Authority and the Riksbank. It also includes carefully prepared crisis management measures. In addition to general measures of the type implemented during the bank crisis in the 1990s, emergency liquidity assistance to individual institutes may be a potentially important measure in dealing with a crisis that has arisen in the financial system. The Riksbank therefore has a legal possibility to provide liquidity assistance to an institute that falls under the supervision of the Financial Supervisory Authority, if it experiences problems. However, both general guarantees and more selective measures for crisis management can in themselves lead to incentive problems, which could sow the seeds of new financial crises. If the banks' creditors assume that they can always be saved by the government if they get into financial problems, there is a clear risk that this will affect their risk behaviour in a negative way. This emphasises the importance of analysing closely both the short-term and long-term effects of potential crisis management measures.

Another important lesson from the bank crisis was that if the different indicators that normally form the background to a financial crisis had been under observation on a regular basis, it would have been possible to detect incipient problems at an earlier stage. This would have enabled the authorities to take measures at an earlier stage to ward off the threat to financial stability.

It is therefore essential that the Riksbank is able to follow and analyse developments in the financial system systematically, in order to achieve a good overall view of the systemic risks that could affect the functioning of the payment system.

This is, in brief, the reason why the Riksbank publishes its assessment of the situation in the financial system, based on analyses of stability. Besides the bilateral dialogues with the banks, the publication of this report is an important element in the Riksbank's endeavours to influence developments in the financial sector. By pointing out and openly discussing important development tendencies, the Riksbank has a greater chance of reaching agreement on the systemic risks.

An analysis of the systemic risks must naturally cover a broad field of macro and micro factors. These involve identifying the external factors, structural changes and tendencies in the banks' risk exposures that could have significance for the accumulation of risks. The analysis also includes assessing the banks' resilience to potential disturbances – both in the form of financial strength and

the capacity to manage the risks connected with operations. In many cases, there is no prepared methodology to lean on; the analysis tools have to be developed step by step.

Macroeconomic developments and financial stability

There is currently great uncertainty over economic developments, mainly related to developments in the USA. Therefore, the Riksbank presents an assessment in this report of how the banks could manage a potentially more serious economic downturn. Both the household sector and the corporate sector have increased their indebtedness. However, their ability to pay is generally good, partly due to low interest rates. Property prices are continuing to rise, but do not appear to be driven by speculation.

International developments

The banks' loan losses are strongly dependent on the economic climate, as the risk that borrowers will not be able to pay off their debts increases during an economic downturn. In previous Financial Stability Reports this macroeconomic development has been discussed only from this perspective. However, it is not merely the loan losses that covary with the economic cycle. The banks' profits and risks in general can be affected by the general developments in the economy. One example is the banks' commission income, which is strongly affected by the development in share prices. Given this, the Financial Stability Report will begin with a description of the international situation as a background to the assessment of developments in the banking sector presented in the remainder of the report.

THE CONNECTION BETWEEN MACROECONOMIC DEVELOPMENTS AND BANK CRISES

Macroeconomic disturbances have played a decisive role in many bank crises, although in most cases they have not been sufficient in themselves to cause the crisis. For instance, regulations and other institutional factors are decisive in the resilience the banking system has to macroeconomic disturbances. A study covering more than 80 bank crises since the mid-1970s indicates that credit growth, asset price increases and economic uncertainty in terms of high volatility in GDP, inflation and the exchange rate are possible causes behind bank crises.[1]

The economic developments that have preceded the financial crises arising around the world over the past two decades have many common elements. Households and companies have greatly increased their indebtedness during a long period prior to the triggering of the crisis, both to finance their consumption and for investment. The loans have often also been used to purchase financial assets and property. Thus, a strong growth in lending and the money volume has not always corresponded to a growing demand for goods and services, which means that inflation has not risen, at least initially.

Both the banks' decisions to grant credit and the general public's demand for loans appear to have been based on optimistic expectations of future growth in income and wealth. These expectations have been reflected in large price rises on shares and property.

Another common denominator is that expectations of high GDP growth and a high return on investment are often further reinforced by an appreciation in the country's real exchange rate. The strengthening of the exchange rate has often taken place parallel to the development of a large and growing deficit in the current account, as the high demand for consumer goods and investment goods has increased imports. However, a massive inflow of capital through share purchases has strengthened the exchange rate.

In countries with a fixed exchange rate, investments have often been financed through short-term loans in foreign currencies, which has led to an accumulating exchange rate risk in the corporate sector that has in turn led to increased credit risk in the banking system. In many countries, where monetary policy was aimed at maintaining a fixed exchange rate prior to the crisis, the *nominal* exchange

1 Caprio & Klingebiel (1997), Bank insolvency: Bad Banking, Bad Policy, or Bad Luck? in the Annual World Bank Conference on Development Economics, 1996.

rate was not affected. However, domestic inflationary pressure, caused by overheating in the economies, had led to the *real* exchange rate being strengthened.[2] The objective of maintaining a fixed exchange rate thus came into conflict with the incentive to counteract the build-up of imbalances. Neither the monetary policy regime nor any other aspect of economic policy counteracted this build-up of imbalances.

Similar problems can also rise in countries with a floating exchange rate. The Japanese finance crisis at the end of the 1980s was preceded by soaring prices, particularly on land and property, combined with a strong credit expansion. Japan is an example of credit expansion initially being reflected mainly in the purchase of property, land and shares. The inflation rate therefore showed no sign of increasing to start with, as the credit expansion was not driven by an increased demand for goods and services. There was a surplus on the current account and the Japanese central bank thus saw no reason in the early stages to raise its interest rate to counteract the financial imbalances being built up.

When a financial bubble finally bursts, the economic downturn is often made more severe and more prolonged by the imbalances that have been built up. The intensified asset prices initially fall more than is fundamentally motivated. A high level of indebtedness, falling asset prices, over-investment and uncertainty over the future keep the aggregated demand down over a long period. When an unexpectedly large percentage of the banks' borrowers are declared bankrupt, when the value of the collateral against which the banks have granted credit declines and when the banks' earning capacity decreases as a result of a severe economic downturn, the banks' solidity may be reduced so far that a bank crisis arises. When the bank crisis becomes a fact, there is a decline in access to credit and a credit crunch occurs, which reinforces the economic downturn. A well-formulated economic policy and management of bad loans play an important role in ensuring that the problems are solved rapidly and effectively.

It can be concluded in summary that the common denominator for many financial crises is that households and companies have taken decisions on consumption and investment based on exaggerated expectations of future growth. This has led to greatly increased indebtedness and rising asset prices. Nor do the banks appear to have taken into account the risks involved in this credit granting and they have thus been undercapitalised.

2 Examples of such crises are the Swedish bank crisis in 1992, and crises in many of the countries affected by the Asian crisis in 1997.

The Swedish economy is expected to show some slowdown in GDP growth in future. The Riksbank forecast in the March 2001 Inflation Report that GDP growth would lie at 2.4 per cent for both 2001 and 2002. Some slowdown in economic activity could be expected to lead to an increase in loan losses for the banks, but for the macroeconomic developments to comprise a real threat to the banks would require a much more severe downturn than is expected in future by both the Riksbank and other analysts. Later in this section we discuss firstly how well equipped the Swedish economy appears to be to face a more severe economic downturn. In conclusion, we consider how a risk scenario might look, in order to comprise a real threat to the Swedish banking sector.

IS THERE A BUILD-UP OF RISK IN THE SWEDISH ECONOMY?

The US economy currently plays a leading role in the global economy, in the sense that developments in the USA are expected to have great significance for economic developments in most other countries, including Sweden. It is therefore especially interesting, from a financial stability perspective, to look at developments in the USA, as the US economy has shown many similarities over the past five or six years with developments that have preceded crises in other countries. We therefore make a comparison with the US economy, in order to illustrate the situation for the Swedish economy with regard to the build-up of imbalances.

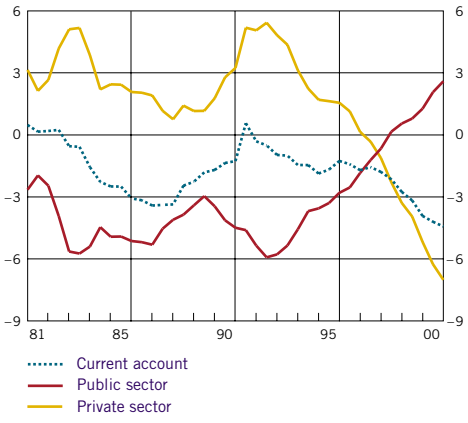
In the USA, optimism over future growth has for a long period pushed up share prices and increased willingness to consume and to invest. At the same time, indebtedness has increased.

In the USA, optimism over future growth has for a long period pushed up share prices and increased willingness to consume and to invest. At the same time, indebtedness has increased. Expectations of high returns have also strengthened the currency, as there has been considerable interest from international investors in buying US shares. This has led to imbalances in savings being built up. Financial saving in the household and corporate sectors has fallen heavily ever since the mid-1990s and last year showed a deficit of 7 per cent of GDP. At the same time, the deficit on the current account has grown continuously since 1991 (see Figure 1).

Even if the developments in recent years may have meant that large financial imbalances have been built up, it is not possible to say for certain how large these are, compared with what is considered as normal savings. If the growth expectations that have formed the basis of decisions on consumption and investment should prove to be essentially well-founded, then a higher growth rate will be realised sooner or later. Indebtedness would not then comprise a major problem, as the borrowers' ability to pay would develop in line with expectations. However, there is a risk that the expectations are not well-founded, and this could lead to many borrowers experiencing problems in repaying their debts. This could entail substantial loan losses for the banking sector.

In Sweden, too, we have seen a development with soaring prices on shares and property over the past few years, although share prices have fallen over the past year. At the same time, a high level of

Figure 1. Financial saving in different sectors in the USA, percentage of GDP. Per cent

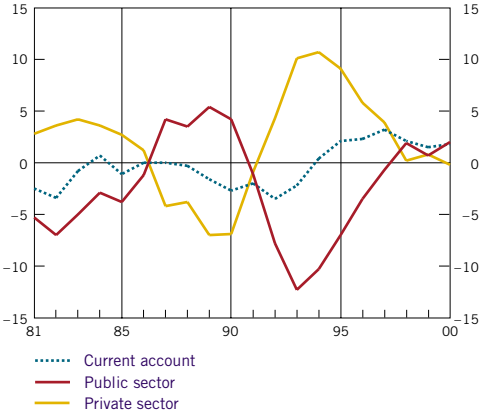


Source: Ecowin.

growth in consumption and investment has led to a credit boom. This strong growth has not led to high inflationary pressure in Sweden, either. However, in Sweden the economic upturn began from a low starting point with a low level of capacity utilisation. Households and companies had just concluded a consolidation process following the financial crisis in 1992, and there was very little willingness to consume and invest. Figure 2 shows that the private sector's financial saving demonstrated a growing surplus during the period 1992 to the middle of the 1990s. This reflects both the fact that companies were not investing in real assets and the fact that both households and companies utilised part of their incomes to amortise their debts. At the same time, a heavily depreciated krona increased the companies' competitiveness and led to a positive development in profits. Although the surplus in financial saving has gradually decreased since 1996, when willingness to consume and to invest began to return, it is only over the past year that this surplus has disappeared. At the end of the 1980s, when the financial imbalances were built up, households and companies were for several years consuming and investing more than was produced during the same period, which was reflected in a substantial deficit in financial savings over many years.

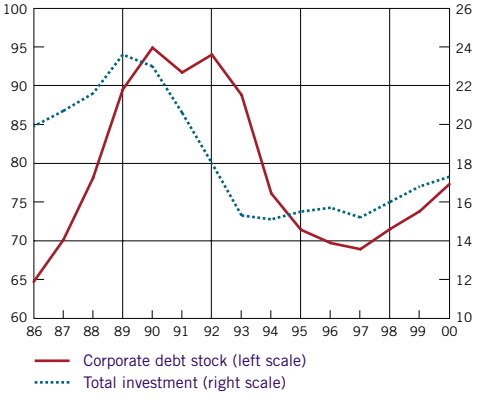
Despite the fact that growth in the Swedish economy has been very strong in recent years, it is only recently that resources appear to have been fully utilised.

Figure 2. Financial saving in different sectors in Sweden, percentage of GDP.
Per cent



Source: Statistics Sweden.

Figure 3. Corporate debt stock and investment as percentage of GDP.
Per cent



Sources: Statistics Sweden and the Riksbank.

Sweden would enter a possible economic downturn from a more balanced starting point than the USA.

Compared with the USA, both the economic slowdown and the fall in share prices occurred at an earlier stage in the economic cycle in Sweden. Neither corporate investment, household indebtedness nor financial savings deficit had had time to grow to any remarkable levels. This indicates that Sweden will enter a possible economic downturn from a more balanced starting point than the USA.

The development of indebtedness and investment also indicates a relatively balanced starting point prior to a potential economic downturn. Neither the level of investment nor the degree of indebtedness indicates that the expectations governing decisions on investment and indebtedness have been as exaggerated as the share prices. Investment as a percentage of GDP was at a much lower level at the end of 2000 than at the end of the 1980s; 17 per cent of GDP compared with 25 per cent (see Figure 3). This also appears to be reflected in a lower degree of indebtedness. While companies' liabilities amounted to 75 per cent of GDP in 2000, the level of indebtedness was as high as 95 per cent during the years of overheating at the end of the 1980s. This also indicates that an economic downturn would not be intensified by an increased need for consolidation or by over-investment in the corporate sector.

The risk that one of the major banks could be affected by such large losses that it triggers a bank crisis as a result of an economic downturn increases the more severe and prolonged the economic downturn becomes. We discuss here, in conclusion, how this type of scenario might look. The starting points for the risk scenario are as follows.

- GDP has been falling for several years.
- A deterioration in companies' profits.
- An increase in corporate bankruptcies.
- Increased unemployment.
- A reduction in household disposable income.
- An unchanged, weak or further weakened exchange rate.
- Share prices continue to fall drastically.
- Long term interest rates rise.

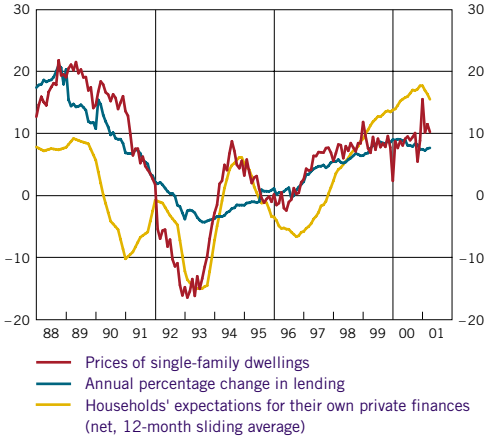
This risk scenario illustrates the macroeconomic factors that are important to the banks and is used in other parts of the report to show how severe the consequences of a negative development could be. It serves merely as an example and should not be confused or compared with the risk scenarios discussed in the Riksbank's Inflation Reports.

The following sections in this chapter discuss the current situation and the effects of a negative development for the banks' central borrower categories; the household, corporate and commercial property sectors. As Swedish banks are also strongly exposed to borrowers in other countries, particularly the other Nordic countries, there is also a special section containing a discussion of general developments in these countries.

The household sector

Households' ability to pay interest and to amortise is mainly dependent on the development of their income and liabilities. This section analyses the development of households' indebtedness and ability to pay. In order to assess households' ability to meet their payment commitments in the event of a decline in income or an increase in interest rates, there is also an analysis of households' assets. This is followed by a presentation of household debt distributed between different credit institutes and the collateral provided for households' loans, in order to ascertain which credit institutes might suffer loan losses if households were to experience payment problems.

Figure 4. The rate of change in the credit institutes' lending to households, prices on single-family dwellings and households' expectations for their private finances.
Per cent and net



Note. Net figures refer to the percentage that replied "better" minus the percentage that replied "worse" to questions regarding their personal finances over the next 12 months.

Sources: Statistics Sweden and the Riksbank.

HOUSEHOLDS' INDEBTEDNESS AND ABILITY TO PAY

Households' indebtedness has increased in recent years, which can probably be mainly attributed to rising house prices. At the same time, households have had a very positive view of the future development of their personal finances (see Figure 4). According to Statistics Sweden's confidence indicator, households' optimism regarding their personal finances has gradually declined during 2000. In March 2001, 23 per cent of households believed that their own economies would improve over the next 12 months, while 13 per cent believed their economies would deteriorate. The development of households' financial wealth and the value of their real estate holdings are reflected to some extent in the expectations for the future and the recent fall on the stock exchange may contribute to the decline in optimism.

Despite the fact that households' expectations for their personal finances have been subdued, the rate of increase in lending to house-

holds by credit institutes has diminished only marginally. In March 2001 the growth rate for total lending was just over 7 per cent on an annual basis. Household debt in relation to disposable income has increased slightly during 2000 and now lies at 109 per cent (see Figure 5). During the years immediately following the bank crisis this ratio was at its highest, with debt amounting to 135 per cent of income. Households' nominal disposable income is expected to rise this year by just over 6 per cent, which would entail a slightly higher level of indebtedness in relation to disposable income in a year's time, if the rate of increase in credit institutes' lending remains the same. For the current level of indebtedness to reach the same relationship between debt and income as at the end of the 1980s, when it was at an all-time high, there would need to be a fall in disposable income of 19 per cent. It can be mentioned as a comparison that during the previous economic downturn, the rate of increase in nominal disposable income had a lowest point of 1 per cent. There would thus need to be a very severe downturn for a fall in the size of 19 per cent.

One factor contributing to the continued increase in household indebtedness could be that interest costs are still at a historically low level.

Household debt in relation to disposable income is currently at the same level as it was ten years ago, while the interest ratio after tax relief is more than halved.

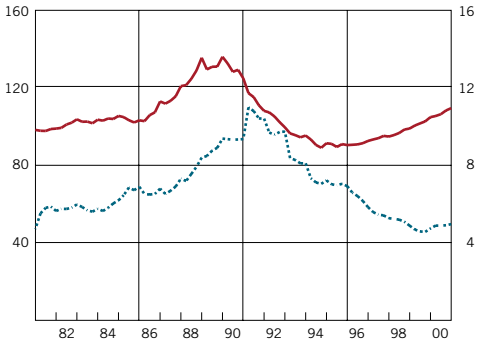
Household debt in relation to disposable income is currently at the same level as it was ten years ago, while the interest ratio after tax relief is more than halved, thanks to a lower interest rate situation, and currently amounts to just under 5 per cent. Assuming an unchanged rate of increase in lending, the interest ratio is expected to rise slightly during 2001, but remain at a low level compared with that in the early 1990s. Taking into account the economic slowdown and households' declining expectations for their personal finances, however, it is probable that the rate of increase in lending will decline. This would entail the interest ratio remaining at the current level or even falling slightly. For the interest ratio to reach the same high level as at the beginning of the 1990s, almost 11 per cent, there would need to be a fall in households' disposable income of more than 50 per cent at current interest rates. Alternatively, it would require unchanged disposable income and an increase in the average interest rate of 8 percentage points. The risk of widespread payment problems in the household sector should thus be low.

The risk of widespread payment problems in the household sector should be low.

HOUSEHOLD WEALTH

Households' financial assets are also studied, in order to assess households' ability to pay their loan costs in the event of poorer income. The financial assets are normally more liquid than the wealth the households have in the form of single-family dwellings and tenant-

Figure 5. Household debt in relation to disposable income and households' interest ratio. Per cent



Note. The interest ratio is defined as interest expenditure after tax deductions divided by disposable income.

Sources: Statistics Sweden and the Riksbank.

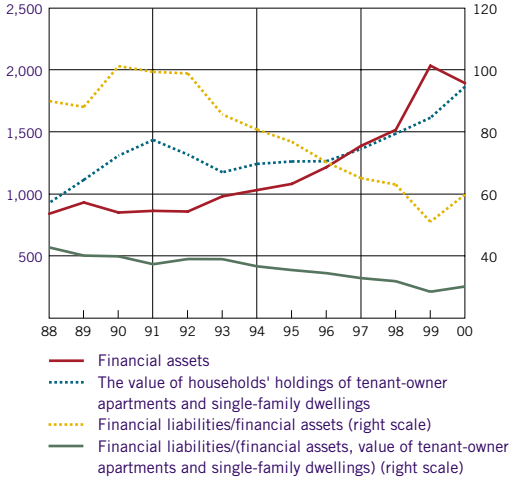
owner apartments. In the event of payment problems, the households can realise their savings in financial assets to meet interest and mortgage payments. Household debt in relation to financial assets can thus function as an indicator of households' repayment ability in the event of a loss of income. However, it should be emphasised that the debt ratio is normally highest among households with a low wealth, although the largest debt in terms of *amount* can be found among the households with the greatest wealth. Studies from 1997 show that household debt in relation to *financial assets* amounts on average to just under 0.8 per cent, while the median household (decile 5-6) has a debt ratio of 1.9.[3] At the same time, the households with the lowest net wealth (decile 1-4) have a debt ratio of 12.6. The differences are also great, although less striking, if the debts are measured in relation to *total assets*. The 1997 figures then show an average debt ratio of 0.28, a ratio for the median household of 0.52, and for the households with the lowest net wealth the debt ratio is 1.67.

Despite the problem with indicators, where only the average can be observed, the indicator can still illustrate general tendencies regarding borrowers' repayment ability in the event of loss of income. Seen over a ten-year period, the large rise in asset prices in recent years has meant that household debt in relation to financial assets has fallen, and is now far from the levels noted during the 1980s (see Figure 6).

Household debt in relation to assets, including the value of single-family dwellings and tenant-owner apartments, provides an indication of households' ability to repay in the long term. In the event of a decline in disposable income, or an increase in interest rates, a household can reduce its loan costs in the long term by choosing a cheaper form of accommodation. The debt ratio calculated to include the value of single-family dwellings and tenant-owner apartments has fallen from 1988, when household debt amounted to just over 40 per cent of assets. At the end of 2000, the corresponding figure was approximately 30 per cent, which indicates a clear improvement in households' long-term ability to repay.

Share wealth has developed negatively since the previous Financial Stability Report. During 2000, the value of households' shareholdings declined by 9.4 per cent. This has entailed the value of households' financial assets declining by 7 per cent during this period (see Figure 6).[4] However, the negative developments on the stock exchange are balanced to some extent by the fact that households' holdings of single-family dwellings and tenant-owner apartments have increased in value considerably in recent years. Real prices for single-family dwellings have risen at an extremely high rate in recent years. Over the past three years the rate of increase has been 7 per cent per annum on average, which should be compared with the fact that the average real rate of increase has lain at around zero per cent since the beginning of the 1980s. The Riksbank's assessment in the March 2001 Inflation Report was that it is reasonable to expect a lower rate of increase in real prices for single-family dwellings that is more in line with general economic developments

Figure 6. Household assets and debt ratio. SEK billion and per cent



Sources: The Ministry of Finance, Statistics Sweden and the Riksbank.

3 Statistics Sweden: Distribution of Wealth in Sweden 1997. Report 2000:1

4 Saving in insurance policies is excluded here as it is tied up in the long term.

in future. In a scenario where share prices continue to fall dramatically, the household debt ratio would deteriorate considerably. This could give rise to increased loan losses if it occurred at the same time as a deterioration in households' disposable income.

COLLATERAL

The greater part of the mortgage institutions' lending to households, 84 per cent, is collateralised by single-family dwellings. The growth in this type of lending by mortgage institutions follows the rate of change in house prices relatively well. Lending with tenant-owner apartments as collateral is continuing to increase substantially and now comprises 10 per cent of the mortgage institutions' lending to households. In March the rate of increase was 37 per cent on an annual basis, which is slightly higher than the rate of increase in March 2000. The substantial increase in lending with collateral in tenant-owner apartments is probably due to the fact that mortgages on tenant-owner apartments are higher than they were before, as prices on apartments have risen so much. The loan requirement has also increased as a result of the number of rentals being converted to tenant-owner apartments recently.

The banks also grant some loans with housing as collateral. The banks' lending with *private housing* as collateral cannot be separated in the statistics, but the banks' lending against collateral in *residential property* has increased by 22 per cent (see the section on the commercial property sector).

Lending with shares as collateral by securities companies and credit institutes increased by 10 per cent during 2000, which can be compared with a rate of increase of 30 per cent during 1999. Total lending with shares as collateral currently amounts to SEK 39 billion.

HOUSEHOLD DEBT BROKEN DOWN BY CREDIT INSTITUTE

Household debt is dominated by loans from banks and mortgage institutions. The loans mainly consist of loans against collateral in single-family dwellings or tenant-owner apartments, as well as loans for consumption with or without collateral. The part of the loan stock without collateral is mainly through banks, with some through finance companies, while most of the loans with collateral in single-family dwellings or tenant-owner apartments are through mortgage institutions. The latter are the largest granters of credit to households, with a loan stock of just over SEK 600 billion to households. They are followed by the banks, with a loan stock of around SEK 250 billion to households, while finance companies' lending to this group totals SEK 37 billion.

Between March 2000 and March 2001, lending from the banks increased by 10.3 per cent, lending by mortgage institutions increased by 5.7 per cent and from finance companies by 28.6 per cent (see the section on the major banks' lending in Chapter 2). Total lending to households increased by 7.6 per cent on an annual basis in March, which is slightly lower than the increase of 9 per cent in March 2000.

The corporate sector

A large part of the bank groups' lending to the general public, approximately sixty per cent, comprises loans to the corporate sector. It is also the corporate sector that has historically been responsible for the major part of the banks' loan losses. The Riksbank therefore monitors the development of indebtedness in the corporate sector, companies' ability to pay their debts and the economic factors significant to the bankruptcy risk in the corporate sector, in order to ascertain at an early stage whether the risk of loan losses in the banking sector has increased.

CORPORATE SECTOR DEBT

Companies' main sources of financing consist of loans through credit institutes, new issues of securities or their own profits. There is reason to examine corporate borrowing on the credit market, and in particular in the Swedish banking sector, from the point of view of stability.

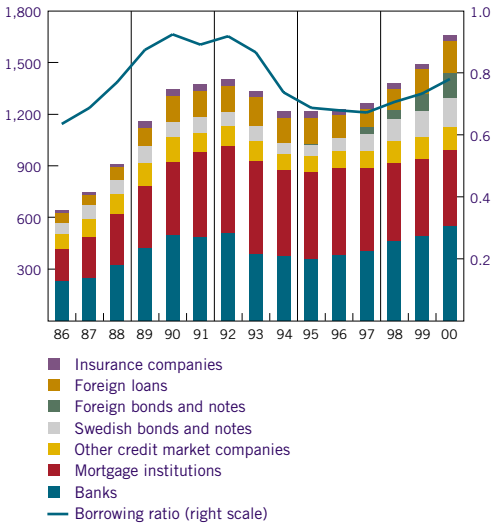
Although corporate borrowing outside of the Swedish banking sector does not comprise any direct threat to stability in the banking sector, it is interesting to study whether total corporate borrowing is developing on a par with the companies' ability to pay. Total borrowing by the corporate sector has increased by between 9 per cent and 11 per cent a year over the past three years (see Figure 7). Although this is a relatively large increase, it is natural that borrowing should increase during times of economic growth.

The corporate sector's borrowing ratio (corporate borrowing in relation to GDP) indicates that corporate borrowing has developed largely in balance with the rest of the economy.

However, the corporate sector's borrowing ratio (corporate borrowing in relation to GDP) indicates that corporate borrowing has developed largely in balance with the rest of the economy. The corporate borrowing ratio was 0.75 in 2000, which can be compared with 0.95 in 1989.

The increase in lending to the corporate sector between December 1999 and December 2000 derived from the Swedish banks (+11 per cent), the Swedish bond and certificates market (+10 per cent), insurance companies (+29 per cent) and the foreign markets for bonds and certificates (+50 per cent). Corporate sector borrowing from mortgage institutions declined during the same period (–1 per cent), as did the sector's borrowing abroad (–4 per cent). The large increase in corporate borrowing on the foreign bond market reflects the fact that the Swedish corporate sector appears to prefer a more liquid foreign bond market to the Swedish bond market, despite the costs for mitigating foreign exchange risks. At the same time, Swedish companies have an increasing amount of foreign assets that have probably been partly financed on the foreign bond market. Given that corporate sector lending is developing in balance with the companies' ability to pay and that foreign exchange risks connected with borrowing abroad are eliminated, it is positive from a stability perspective that the corporate sector is increasing its borrowing outside of the Swedish banking sector. The concentration of credit risks in the banking sector is reduced and borrow-

Figure 7. Corporate borrowing and borrowing ratio. SEK billion and per cent



Source: The Riksbank.

ing on the bond market should contribute to more efficient and more transparent pricing of credit risks.

However, as it is mainly large companies with a high credit rating that can borrow on the bond markets, this means that lower risk credits are leaving the banks and that the average risk in the banks' credit portfolios will rise. This could increase the level of risk in the banking sector if the banks do not manage to incorporate the real credit risk within various companies into their pricing.[5]

In addition to increased borrowing outside of the banking sector, financing via new share issues should also be a positive element from the point of view of stability. This is because the share capital comprises a buffer to the creditors, as they take priority over the shareholders. Financing on the share market also increases the insight into companies and the funding of companies is spread to players outside of the banking sector. The financial accounts show that companies have gradually increased the percentage of financing through equity capital, while the percentage of financing through borrowing from financial companies has declined (see Figure 8).

Balance sheet data 1999 shows a falling debt/equity ratio and a rising interest coverage ratio in the corporate sector (see Figure 9). The high interest coverage ratio means that companies should have a good resistance to rising interest rates and the low debt/equity ratio indicates that the companies' capacity to withstand an economic slowdown and receding profit margins is fairly good.

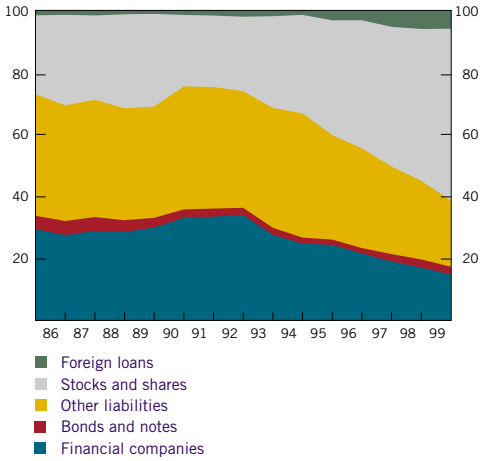
Since the year-end closing 1999, share prices on the OM Stockholm Exchange have both risen and then fallen heavily (see Figure 10). From December 1999 share prices rose by an average of 18 per cent until the end of February 2000, when they fell during the next 12-month period to a level approximately 17 per cent lower than the starting point in December 1999. This is an indication of rising financing costs for the corporate sector as a result of a decline in the market's expectations of future earning capacity in companies.

However, developments in share prices differ considerably between different industries. It is mainly the share prices for IT and telecom companies that have fallen during this period, with a decline of 62 per cent and 32 per cent respectively since December 1999. The share prices for companies in the manufacturing industry fell by an average of 5 per cent, while share prices for property companies and companies in the services sector rose by 34 per cent and 24 per cent respectively during the same period.

Telecommunication companies comprise a substantial part of Swedish trade and industry, approximately 16 per cent of the value added in the manufacturing industry and 4.6 per cent of the value added for Swedish trade and industry as a whole (which can be compared with the services sector that comprises approximately 60 per cent). According to information from the banks themselves, the major banks' lending to the entire telecommunications industry (operators and manufacturers) amounts to between 1.5 per cent and 2 per cent of the major banks' total lending. The decline in the telecommunications sector should also be regarded in a longer-term perspective. Share prices for the most important companies are no lower now than they were 18 months ago. Several of the shares

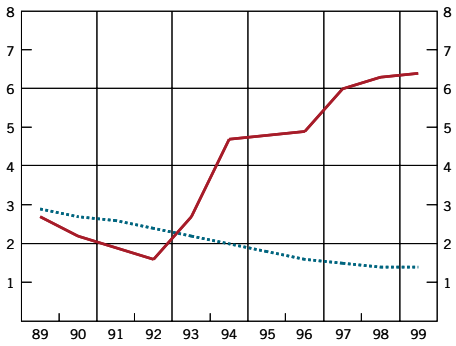
5 A more detailed discussion of this is contained in Financial Stability Report 2000:2, p. 32.

Figure 8. Corporate financing structures. Percentage breakdown



Source: Statistics Sweden.

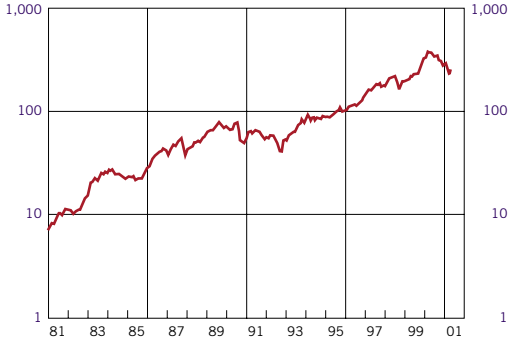
Figure 9. Interest coverage ratio and debt/equity ratio in the corporate sector. Per cent



Note. The interest coverage ratio is defined as operating income plus financial income divided by financial expenditure. The debt/equity ratio is defined as liabilities divided by equity.

Source: UC AB and the companies' annual accounts.

Figure 10. The Affärsvärlden general index. Index: December 1995 = 100 (logarithmic scale)



Source: Ecowin.

have achieved a worth two or three times as high since then, but these should be seen as extreme prices, affected by the over-speculation in IT-related shares during October 1999 and March 2000. This sector has also been subject to considerable attention from banks and other financiers, as well as supervisory authorities, which has contributed to a substantial risk awareness with regard to lending to this sector.

Although the share prices for telecommunications companies have fallen relatively heavily, which should indicate that the financing cost and the credit risk for this sector have increased, the major banks' relatively modest exposure to this sector indicates that a possible reduced capacity among telecommunications companies to pay their debts would not comprise a significant threat to stability.

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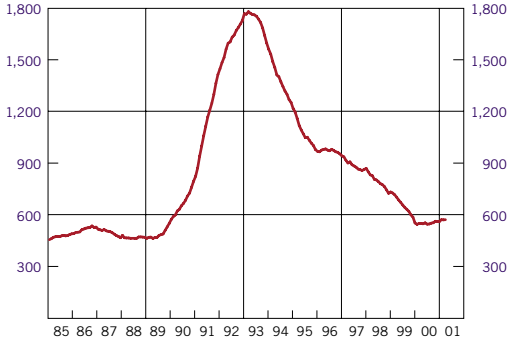
BANKRUPTCY RISKS IN THE CORPORATE SECTOR

Empirical studies at the Riksbank show that the percentage of bankruptcies estimated with a set of macroeconomic variables can be used as a leading indicator of the banks' future credit losses.[6] The estimates show that the actual percentage of bankruptcies for limited companies declines when economic activity improves, there is a lower nominal interest rate and strong real exchange rate. In addition, the study indicates that UC's bankruptcy forecasts are important to the banks' credit decisions and that UC's bankruptcy forecasts do not take into account forecasts for macroeconomic developments.[7] This could lead to the banks underestimating the credit risks when the economic situation suddenly deteriorates.

The development of bankruptcies in the corporate sector is reported in Figure 11. Here it is implied that the reduction in the number of bankruptcies, calculated as a sliding average on an annual basis, came to a standstill at the end of 1999/beginning of 2000. Bankruptcies mainly occur among small companies. Since December 2000 only 6 per cent of the bankruptcies have involved companies with more than 10 employees. A recent study carried out by the Federation of Private Enterprises shows that bank loans to small companies often have the nature of risk capital, as small companies do not normally have access to the risk capital market. This means that the banks' actual degree of loss with regard to credits to small companies could be higher. An increase in bankruptcies among small companies as a result of an economic downturn could thus give rise to substantial loan losses for the banks.

The Riksbank uses the above-mentioned model to forecast the development in corporate bankruptcies. Together with the main

Figure 11. Number of bankruptcies in the corporate sector. 12-month sliding average



Source: Statistics Sweden.

6 Jacobson and Lindé, Credit rating and the business cycle: can bankruptcies be forecast? Sveriges Riksbank Economic Review 2000:4.

7 UC AB is a wholly-owned subsidiary of the banks, which supplies them with credit ratings.

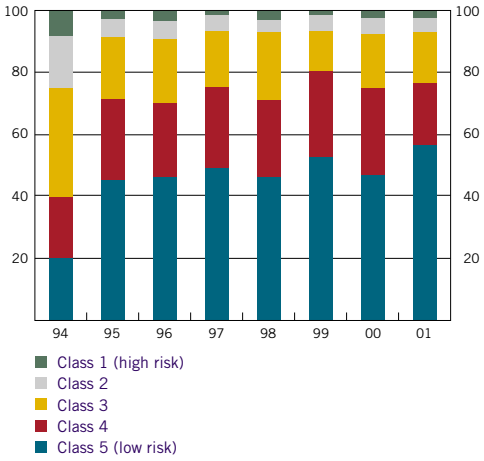
scenario in the Riksbank's March 2001 Inflation Report of a GDP growth of 2.4 per cent a year and a slightly stronger exchange rate for the krona as the point of departure, the model indicates an unchanged low level of bankruptcies in the corporate sector for the period two years ahead. It is only when GDP growth is negative, with an unchanged weak exchange rate, that the number of corporate bankruptcies rises to levels that can involve substantial loan losses for the banks. In a risk scenario with a GDP growth of minus 1.5 per cent a year with an unchanged weak exchange rate two years ahead, the number of companies going bankrupt would increase by approximately 50 per cent. However, it should be pointed out that although these percentage changes are large, they would involve an increase from relatively low starting levels. In the case of a steadily negative growth, the number of corporate bankruptcies would be approximately half the number observed during the economic downturn between 1991 and 1993, when GDP declined by between 1.1 per cent and 1.8 per cent a year.

A complementary picture of the bankruptcy risks in the corporate sector can be seen in the risk classification of all limited companies produced by UC AB (see Figure 12). UC's distribution of limited companies into different risk classes is based on annual accounts, records of non-payment, age, size, etc. The companies are divided into five different risk classes, depending on how great the probability is assessed to be that they will become insolvent within two years' time. The percentage of companies in the risk class with the lowest probability of becoming insolvent (risk class 5) has increased slightly and the percentage of companies with the greatest probability of becoming insolvent (risk class 1) has declined slightly since the start of the year. This provides support for the conclusion by Jacobson and Lindé that UC's bankruptcy forecasts lag behind macroeconomic developments. The fact that the banks appear to rely quite heavily on UC's risk classification when granting credit, combined with the fact that their model systematically fails to pick up the turning point in the economy, entails an underestimation of the credit risk at the height of an economic boom. It can also reinforce any procyclicality problems in the banking sector (see the special article entitled "The business cycle and regulations for banks").

The likelihood of going bankrupt for Swedish listed non-financial companies as calculated by KMV Corporation reinforces the impression that the bankruptcy risk in the Swedish corporate sector had increased up to the end of February 2001. KMV uses share prices and information from annual accounts to calculate the probability of limited companies going bankrupt within a specific time horizon, Expected Default Frequency (EDF). EDF shows the risk of a listed company being unable to meet its payments obligations and is obtained by calculating the probability that the market value of the company's assets fall short of the size of its liabilities at the time the liabilities fall due for payment. The market value of the company's assets is in turn derived from the company's market value using the options pricing method.

All of the countries listed in Figure 13 showed increased bankruptcy risks in the corporate sector during 2000. The bankruptcy probability for Swedish companies is the lowest of all of the countries studied in the comparison.

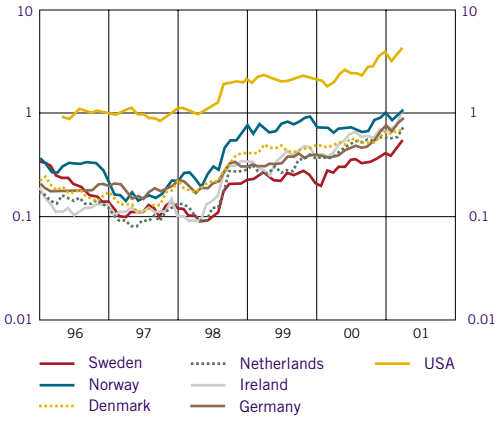
Figure 12. Percentage of companies in different risk classes. Per cent



Note. The data for 2001 refers to last of February.

Source: UC AB.

Figure 13. Expected Default Frequency (EDF) for non-financial, listed companies. Per cent (logarithmic scale)



Source: KMV Corporation.

All in all, it is not probable that the number of bankruptcies will increase to a level that would entail serious consequences for the banks.

All in all, it is not probable that the number of bankruptcies will increase dramatically in the Swedish corporate sector. Based on today's low levels of loan loss, it is unlikely that loan losses will reach a level that would entail serious consequences for the banks.

The commercial property sector

The banks are exposed to the property sector both through lending with property as collateral and through lending directly to property management companies. The major banks' accounts show that lending to property management companies comprises approximately 15 per cent of total lending to the general public. The bank's lending with property as collateral has shown a relatively stable development so far. However, there was a comparatively large increase during 2000, of 22 per cent for residential property and 19 per cent for commercial property (see figure 14).

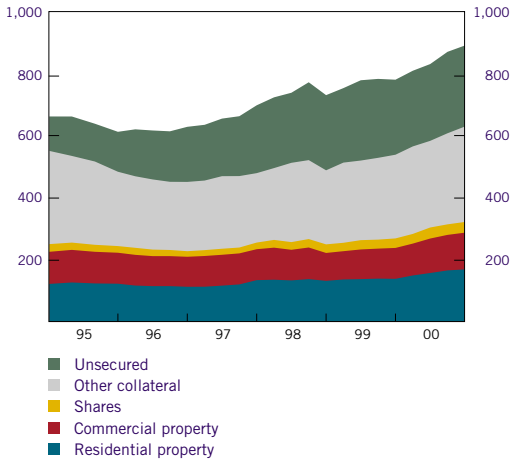
The analysis of the property sector is aimed at studying whether property prices show a reasonable relation to expected yield on property, describing the current developments in prices and rents, and studying the property companies' ability to pay. As regional growth in metropolitan regions comprises the major part of the growth of the whole economy and as developments in prices and rents on the property market have been strongest in these regions, the study of the property market is focused on developments in the metropolitan areas.

DEVELOPMENTS IN PRICES AND RENTS ON COMMERCIAL PROPERTY AND APARTMENT BLOCKS

Prices on both apartment blocks and commercial premises have shown a strong rate of increase since 1993 and 1994, when commercial property prices were at their lowest point following the property crisis (see Figure 15). If the pricing is correct, the price of a property should reflect the current value of the property's expected yield, consisting of a net operating result and a future increase in value. An increase in the price of the property today can thus be caused by an increased net operating result, increased expectations of the future price of the property or a decline in the nominal yield curve. Although rent levels tend to follow property prices, expectations of future property price changes or a change in the nominal yield curve can trigger corrections in property prices. However, a balanced development in the property market requires that there is a balance between rent income and property prices.

Statistics on prices and rents in metropolitan areas indicate that the price increase for commercial property has developed at the same rate as rent increases, but that the price rise on apartment blocks exceeds the development in rents.

Figure 14. The banks' lending against collateral. SEK billion



Source: Finansinspektionen.

Statistics on prices and rents in metropolitan areas indicate that the price increase for commercial property has developed at the same rate as rent increases, but that the price rise on apartment blocks exceeds the development in rents. It can be seen from Figure 15 that price developments for both apartment blocks and commercial property between 1987 and 1990 far exceeded rent developments, which indicates that property prices were pushed up by expectations of future rises in property prices. Sales of apartment blocks are currently comprised largely of sales in connection with the transformation of rental properties into tenant-owner associations. As the system of setting rents based on utility value limits the income that can be generated by a rental property, the market value of these properties is also limited. The prices for transfers in connection with the formation of tenant-owner associations therefore exceed the market value for rental properties. Thus, price developments on apartment blocks do not reflect changes in income flows from renting out apartments.

Figure 15. Developments in real prices and rents in metropolitan areas. Index 1987 = 100

Source: Celexa fastighetskapital AB.

Given that the strong price increase for apartment blocks is caused by change-over to tenant-owner associations and that lending to tenant-owner apartments and tenant-owner associations is relatively small, price developments on apartment blocks are not expected to comprise a problem to financial stability.

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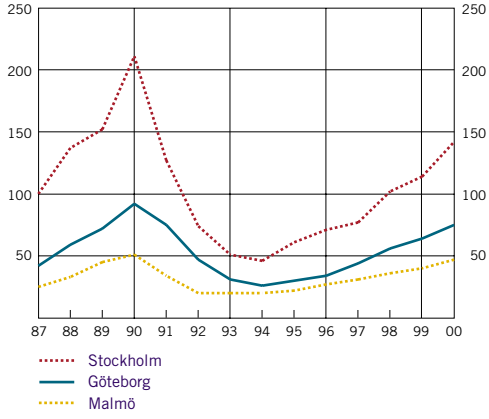
Rents for commercial property are determined by the market and are therefore more sensitive to changes in supply and demand than the regulated rents for apartment blocks. This is also reflected in Figure 15, where the regulated rents for apartment blocks show an even and weak rate of increase over time. At the same time, rents for commercial property fell drastically in connection with weaker growth in the real economy from 1990 to 1994, only to rise again with the increase in economic activity.

Both prices and rents for commercial properties have increased by approximately 20 per cent in real terms in metropolitan areas during 2000. However, today's price level for commercial property is in real terms around 25 per cent lower than the price level in 1990, which was the year immediately prior to the property crisis. At the same time, today's rents for commercial property are in real terms approximately 14 per cent above the peak level for rents that was noted in 1990. This indicates that the strong price increase on commercial property with effect from 1994 appears to be motivated on the basis of fundamental factors and that the price level has developed on a balance with rent increases. This is a significant difference, compared with the four years preceding the property crisis in 1990, when the prices on commercial property doubled, while rents only rose by approximately 20 per cent.

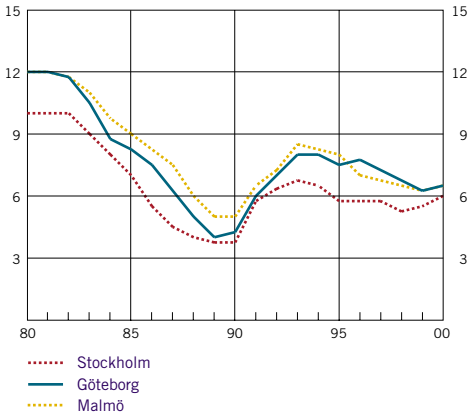
In a comparison of the three metropolitan areas of Stockholm, Göteborg and Malmö, Stockholm shows the strongest fluctuations

Figure 16. Developments in real prices on commercial property. Price per square metre, Index 1987 = 100



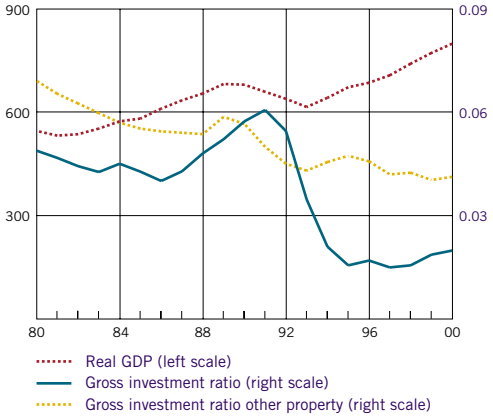
Source: Celexa fastighetskapital AB.

Figure 17. Direct yield requirement, commercial property. Per cent



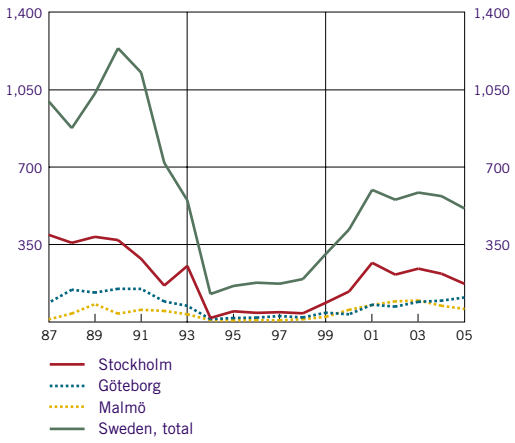
Source: NewSec.

Figure 18. Gross investment ratio in property and development in real GDP, 1980 prices. SEK million and per cent



Source: Statistics Sweden.

Figure 19. Estimated supply of commercial space. Thousand square metres



Source: Byggstatistik AB.

in real prices on commercial property (see Figure 16). Today's price levels comprise approximately 70 per cent of the peak level before the property crisis in 1990. The corresponding figures for Göteborg and Malmö are 80 per cent and 90 per cent respectively.

It is possible to obtain a picture of whether price developments on the property market are sustainable in the long term by studying how the yield requirement for investments relates to the properties' direct yield. A property's direct yield states the size of the operating surplus (the difference between rent income and operating costs) a property is expected to generate in relation to the value of the property. The difference between an investment's total yield and direct yield can be assumed to comprise the compensating increase in value required by an investor to execute a property investment at the given market price. By comparing the property's direct yield with the investors' yield requirements, it is possible to obtain a rough measure of the investors' expectations of the property's future increase in value.

Direct yield for commercial property in 2000 was 5.8 per cent, based on the Swedish property index. According to SVEFA, in January 2001 direct yield for commercial property amounted to between 6.25 and 7 per cent in Stockholm, between 6.5 and 9.5 per cent in Göteborg and between 6 and 8.5 per cent in Malmö, depending on the location. The investors' yield requirement for property investments is calculated as the long-term nominal risk-free interest plus a risk premium for investments in property.[8]

The price change on commercial property required for the property's total yield to be in line with the investors' yield requirement indicates that investors are not basing their investment decisions on exaggerated expectations of future price increases.

THE SUPPLY AND DEMAND RELATIONSHIP

When one looks at investments in property in relation to GDP (the gross investment ratio in property), one sees an indication that investment in the property sector has lagged behind the rest of the economy since the property crisis in the 1990s. The gross investment ratio for both residential and other property has remained at an unchanged level since 1994 (see Figure 18). As the net difference between rents and operating costs forms the basis for the value of the property, one might expect that construction of property would have increased as rents increase. However, factors such as regulated rents for rented property, a lack of land with planning permission in growth regions and a long drawn out planning process could all contribute to a continued low level in residential construction.

New production of commercial property is increasing throughout the country and particularly in the Stockholm area. At the same

8 The calculation of the risk premium is based on the CAPM model regarding the relationship between risk and yield. The risk premium for each asset corresponds to the asset's own risk measured as the covariation between the yield on the asset and the market yield, what is known as the ß-value, times the risk premium on the market as a whole. The ß-value assumed here is calculated with the aid of the Affärsvärlden general index and Statistics Sweden's property price index for commercial property during the period 1970-2000. The market risk premium is estimated at 4.3 per cent, according to Öhrlings Pricewaterhouse Coopers.

time, the number of building permits granted is increasing, which is an indicator that new production will probably continue to increase.

The investment level for commercial property is still way below the levels prevailing at the end of the 1980s and beginning of the 1990s.

However, the investment level for commercial property is still way below the levels prevailing at the end of the 1980s and beginning of the 1990s. The peak levels during that period showed production of around 1.2 million m^2 of commercial space per year throughout Sweden, compared with just under 600,000 m^2 this year (see Figure 19).

An economic downturn can lead to falling rents for commercial property and to new production of commercial property declining again in a year or so. Increased vacancy rates in Stockholm indicate a decline in demand (see Figure 20). Declining demand is making an impact on the market rents, which in turn could lead to a decrease in new production.

PROPERTY COMPANIES' ABILITY TO PAY

Property-related loan losses in the banking sector may be caused by collateral declining in value through falling property prices, but also by property companies' lack of ability to pay their debts. Income in the property companies is mainly affected by rent levels, interest costs for loans, vacancies and operating costs. During 2000, the property companies have been able to benefit from relatively high rents and low interest rates, which has led to the companies listed on the stock exchange showing a relatively strong financial position.

Compared with the annual accounts for 1999, the debt/equity ratio has increased for property companies listed on the stock exchange, although not to a markedly high level in a longer term perspective.

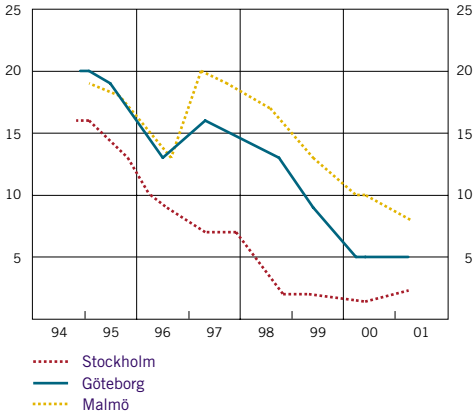
Compared with the annual accounts for 1999, however, the debt/equity ratio has increased for property companies listed on the stock exchange, although not to a markedly high level in a longer-term perspective (see Figure 21).

A supplementary picture of the financial position of the property companies listed on the stock exchange can be obtained from KMV's calculations regarding the probability of bankruptcy within a given time horizon (see Figure 22). These indicate that the probability of bankruptcy for the listed property companies declined during the period up to October 2000, only to increase again slightly up to the end of January 2001.

All in all, the financial position of the property companies appears relatively stable, although the level of indebtedness has increased.

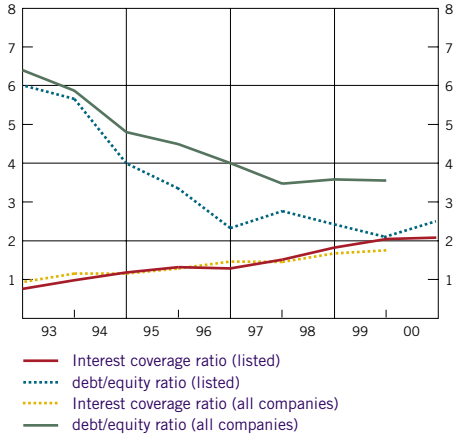
All in all, the financial position of the property companies appears relatively stable, although the level of indebtedness has increased.

Figure 20. Vacancy rates for commercial property in metropolitan areas. Per cent



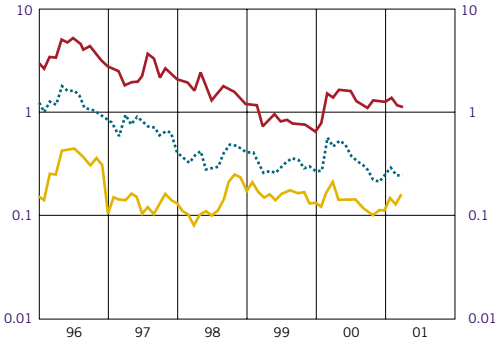
Source: NewSec.

Figure 21. Interest coverage ratio and debt/equity ratio in property companies, weighted average. Per cent



Sources: UC AB and annual accounts.

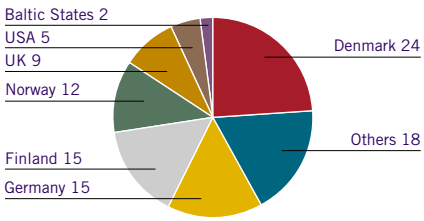
Figure 22. Expected Default Frequency (EDF) for listed property companies. Per cent (logarithmic scale)



Note. The lowest quartile refers to the 25 per cent companies with the lowest credit rating. The third quartile refers to the 25 per cent companies with the highest credit rating.

Source: KMV Corporation.

Figure 23. The major banks' foreign claims, excluding interbank. Geographical breakdown, per cent



Source: The Riksbank.

The risk profile for the banks' foreign borrowers

The Swedish banks' increased commitments to and acquisition of banks in other Nordic countries and in Germany mean that the banks are less unequivocally exposed to the Swedish economy. This motivates a brief review of financial stability in these countries.[9] Approximately half of the Swedish banks' lending to the general public comprises lending to Swedish borrowers and the remaining half comprises lending to foreign borrowers. It is therefore necessary for the Riksbank to follow economic developments in the countries where the external claims are largest, in order to obtain a comprehensive picture of the risks within the major banks. This report focuses on any tendencies that could be perceived to lead to extensive credit losses. Figure 23 shows the geographical distribution of the Swedish bank group's claims abroad at the end of 2000.[10]

All countries show a relatively good GDP growth during 2000. However, relatively high oil prices, declining consumer confidence, the slowdown in the US economy and uncertainty over future economic developments in the USA are expected to lead to overall lower GDP growth during 2001. With regard to Finland, where the electricity and electronics industries comprise one third of the country's exports of goods, uncertainty over global demand for telecommunications equipment contributes to increased uncertainly regarding Finnish GDP growth. A high level of capacity utilisation and inflationary pressure in the Norwegian economy has contributed to Norwegian short-term interest rates lying 2 percentage points above the average for the euro area. Bank lending to the household sector has increased in all countries except Germany. In Denmark and Norway this increase in lending is relatively large, partly as a result of rising house prices in previous years. However, none of these countries' household sectors show an alarming level of indebtedness. Bank lending to the corporate sector is increasing at a moderate rate in Denmark and at a relatively rapid rate in Norway. Despite declining profits, solidity is relatively satisfactory in both the Danish and Norwegian corporate sectors. In both Germany and Finland, bank lending to the corporate sector has been subdued. In Finland large corporations are borrowing abroad to an increasing extent and in Germany lending has been subdued after being forced up as a one-off effect during the third quarter of 2000 in connection with financing for the purchase of UMTS mobile telephone licences. Following on from the increased uncertainty over economic developments and subdued GDP growth, property prices have stagnated in all countries except for Denmark during second half of 2000. There were signs of rising property prices in both Norway and Denmark during the first quarter of 2001.

9 The review of the Nordic countries is based on the stability reports exchanged between the Nordic central banks on a twice-yearly basis. During 2001 this will take place on 1 April and 15 September. The review of developments in Germany is based on the Bundesbank's monthly report for February 2001, see Deutsche Bundesbank Monthly Report February 2001. Information on GDP growth and interest rates is taken from OECD Economic Outlook No. 69, May 2001.

10 Claims abroad refers to the claims abroad reported in the bank groups' balance sheets.

The Riksbank's assessment is that none of the countries against which the Swedish banks have a large exposure appears to show an economic development that gives reason to fear any major losses related to these operations.

Table 1. Stability indicators in the Nordic countries and Germany

	GDP growth			Interest rates		Growth in lending			Indebtedness		
Country	1999	2000	2001	Short	Long	General public	House-hold	Corpor-ate	House-hold	Corpor-ate	House prices
Norway	0.9	2.2	2.0	6.7	6.9	High (14%)	High	High	Moder-ate	High	Rising
Denmark	2.1	2.9	2.0	5.0	5.6	Moder-ate	Moder-ate	Moder-ate	Moder-ate	Moder-ate	Rising
Finland	4.2	5.7	4.0	4.4	5.5	Low (5.2%)	Low	Low	Moder-ate	Low	Falling
Germany	1.6	3.0	2.2	2.2	5.9	Low (5%)	Low	Low	–	–	Rising slightly

Sources: OECD and the central banks in Germany, Denmark, Finland and Norway.

Note. GDP growth for 2001 is taken from the OECD's forecast.

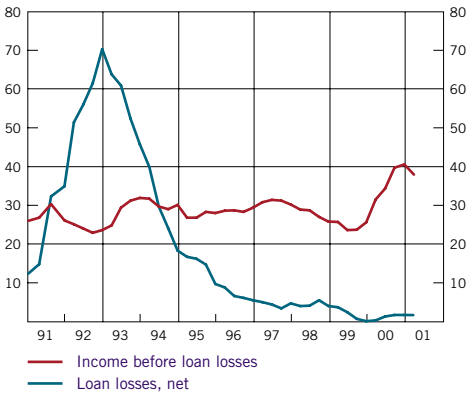
Stability in the banking system

The underlying earnings among the Swedish major banks were higher than ever before in 2000, which was due both to improved earnings in their Swedish operations and to an increasing expansion outside of Sweden. However, a large part of the improvement in results took place during the first quarter, which was characterised by a very favourable stock market. As the markets have deteriorated during later quarters, earnings have stagnated.

The Riksbank's analysis of the systematically important banks is aimed at profitability, quality of assets, financing and capital strength. The Swedish banking sector is currently undergoing an accelerating process of change, which makes great demands on the banks' ability to adapt. The most important factors behind this process include changes in households' and companies' needs for financial services, rapid developments in technology and the integration of the European financial market.

These structural changes create new opportunities for the banks, but also involve strategic risks. As a result of increasing competition, the profit margins on the banks' traditional products are being squeezed, while expansion on new markets requires major investments and to some extent new competence. Strategic miscalculations may result in substantial losses and a severe deterioration in profitability, which in turn can provide an incentive, under certain circumstances, for increased risk taking. Against this background, this chapter contains a report on financial developments among the major banks with the emphasis on the past year.

Figure 24. Income before loan losses and loan losses, net in the major banks, aggregated over four quarters.
SEK billion, 1991 prices

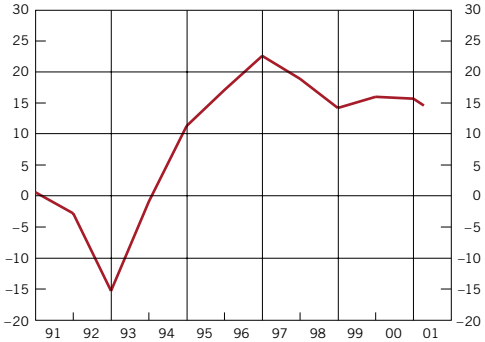


Sources: The banks' reports and the Riksbank.

Profitability

The underlying earnings (profits before loan losses) of the Swedish major banks reached their highest ever level in 2000 (see Figure 24). This increase in earnings is partly explained by improved earnings in their Swedish operations, but also by increasing expansion outside of Sweden. At the same time, return on equity after tax was just under 16 per cent, which is slightly lower than the average level for the past five-year period (see Figure 25). This is, of course, due to the fact that the equity on which the return is calculated has grown slightly more than the profits. During the first quarter of 2001, both underlying earnings and return on equity have declined compared with the whole year 2000.

Figure 25. Return on equity after tax in the major banks.
Per cent



Sources: The banks' reports and the Riksbank.

METHOD

The Riksbank's analysis of the major banks is directed towards entire groups and thus includes mortgage institutions and other subsidiaries. As the banking sector consolidates both in Sweden and abroad, the individual groups are undergoing major changes, which makes comparability over time more difficult. The focus of the analysis is on the underlying developments in the major banks and therefore the levels, ratios, measures and distributions refer to the actual group at that point in time, while changes between periods exclude mergers and major acquisitions. In addition, all of the figures are normalised, i.e. exclusive of one-off effects such as capital gains, unless otherwise stated.

The increasing international element in the major banks' income and assets also means that the connection between the major banks' financial development and the specific macroeconomic developments is weakened, while developments on the Nordic and European markets take on greater importance. However, the Swedish market is still the most important individual market for the major banks as a group.

Table B1. Group changes caused by major mergers and acquisitions

Group	Includes as from
Swedbank	Föreningsbanken 1995:1
Handelsbanken	Stadshypotek 1997:1
S E B	Trygg-Hansa 1997:1, BfG 2000:1
Nordea	Merita 1997:1, Unidanmark 2000:1, Christiania Bank og Kreditkasse 2001:1

Note. The date refers to the year and quarter of change in group data.

INCOME

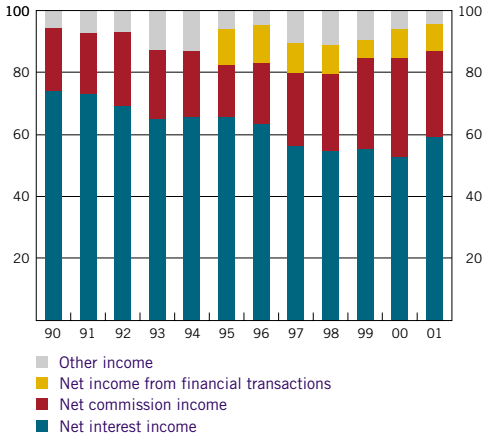
The major banks' income increased by 14 per cent during 2000 compared with the corresponding period in 1999. However, the majority of the increase in income occurred during the first quarter, after which income remained at a largely unchanged level. The high rate of increase in the banks' income during 2000 is explained almost completely by rapidly growing commission income from asset management, securities trading and corporate finance services, as well as a strong net income from financial transactions. Net interest income, which is the largest source of income, made only a marginal contribution to the increase in income. However, as the stock markets have weakened over the past quarters, net interest income's significance as a source of income has been strengthened.

Net interest income increased slightly during 2000, due to both a weakly rising short-term interest rate over the year and growing volumes in deposits and lending. This slightly positive development in net interest income has continued during the first quarter of 2001. Rising short-term interest rates affect net interest income in two ways; through improved return on the banks' short term positions and above all through enabling higher lending and deposit margins (the difference between the banks' interest rate and the short-term market rate).[11] In a longer-term perspective, net interest income from the major banks' domestic operations has remained largely constant despite an increase in lending (see Figure 27). This is mostly explained by the historically low margins prevailing on the lending and deposit markets. The low margins are in turn due to both the generally low interest rate situation and the past few years' steady increase in competition. An economic slowdown in line with the main scenario, with a lower growth in lending and unchanged short-term interest rates indicates that net interest income will continue to show weak growth.

Net commission income increased by just over 30 per cent on an annual basis during 2000, primarily due to the strong first quarter, but also to income in connection with the premium pension selection and the initial public offering of Telia. The decline on the stock exchange that began during the second quarter of last year has resulted in the growth in net commission income coming to a halt, which clearly illustrates the fact that the banks' income has become increasingly linked to the stock market development (see Figure 28). The direct effect of a weak stock market over a long period of time is a reduction in asset management and brokerage income, as the value of mutual funds and transactions falls. There are also several indirect effects on income from a weaker stock market. On the supply side, declining and turbulent markets entail a lower level of activity with regard to initial public offerings and corporate finance transactions, which reduces the banks' income from corporate finance services. On the demand side, a weak stock market leads to less interest from investors, which results in a declining turnover and a lower net inflow to mutual funds and the stock market. This in turn affects the banks' income from brokerage and asset man-

11 At lower interest rate levels it is more difficult for the banks to maintain their profit margins. This becomes particularly clear on the deposit side, as the banks cannot offer their customers a deposit rate below zero, no matter how low the interest rate level.

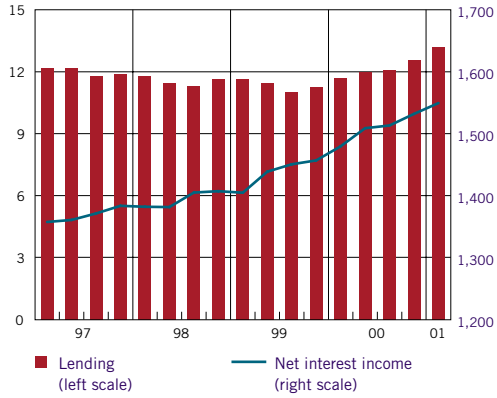
Figure 26. Distribution of income in the major banks. Per cent



Note. The data for 2001 refers to period Jan–March.

Sources: The banks' reports and the Riksbank.

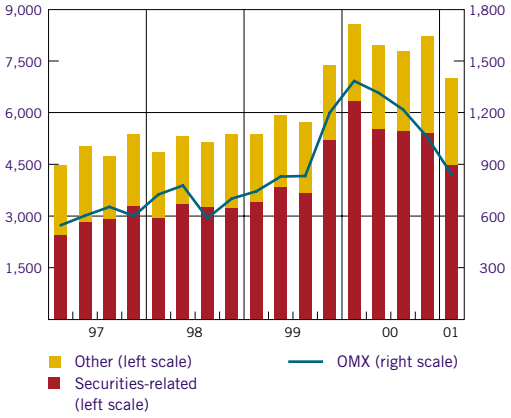
Figure 27. Net interest income in the major banks and lending. SEK million



Note. Excluding BfG, Unidanmark and Christiania Bank og Kreditkasse.

Sources: The banks' reports and the Riksbank.

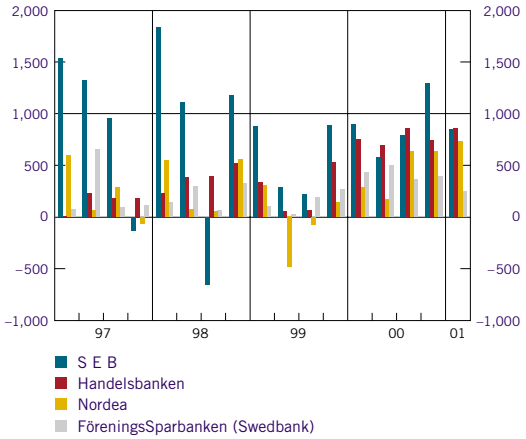
Figure 28. Net commission income in the major banks and development of the stock exchange. SEK million and OMX index



Note. Excluding BfG, Unidanmark and Christiania Bank og Kreditkasse.

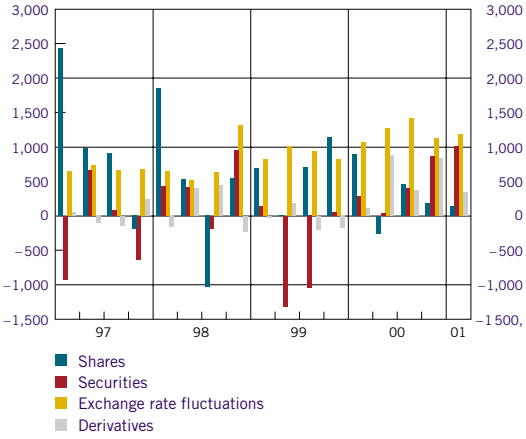
Sources: The banks' reports and the Riksbank.

Figure 29. Net income from financial transactions.
SEK million



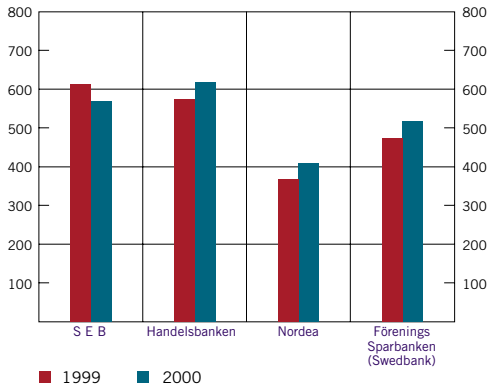
Source: The banks' reports.

Figure 30. Net income from financial transactions in the major banks, broken down over type of transaction.
SEK million



Source: The banks' reports.

Figure 31. Average cost per employee.
SEK 000s



Sources: The banks' reports and the Riksbank.

agement. Another possible effect of a weak stock market is that the low or negative return investors then achieve leads to a demand for lower asset management charges.

There would need to be an extreme deterioration on the stock market to comprise a serious threat to the major banks' earning capacity.

All of the major banks have increased the percentage of net commission income in their total income, but there is still a difference with regard to the level. A prolonged weak development on the stock market would therefore affect different banks to a slightly different extent. The size of the total effect on their income would depend on the banks' capacity to reduce costs and on the size of the indirect effects. In total, there would need to be an extreme deterioration in the stock market for it to comprise a serious threat to the major banks' earning capacity. According to the Riksbank's calculations, a development where the Stockholm Stock Exchange first fell another 40 per cent and then stagnated for the next year, while other foreign stock markets remained unchanged, could result in a decline in net commission income by approximately SEK 8 billion from the level in 2000. This can be compared with the major banks' total results during this period, which amounted to more than SEK 45 billion.

The net income from financial transactions (net transaction income) is the total result of the transactions in shares, interest-bearing securities and foreign exchange. This result contains both realised and unrealised gains and losses. One of the main explanations for the positive growth in the net transaction income over the past quarters has been strong foreign exchange-related income (see Figure 30). Another reason was a falling long-term interest rate during the latter part of the year, which resulted in an increase in value of the banks' bond portfolios.

Net transaction income varies considerably from one period to another, as it is determined by the combined developments on the money, foreign exchange and stock markets, and it is therefore difficult to forecast future developments. However, net transaction income still contributes a relatively small share to the banks' total results, which means that a deterioration in this income would not normally threaten the banks' survival.

COSTS

Costs increased by 9 per cent during 2000, compared with 1999, although costs in traditional banking operations fell. Instead, it was IT costs and other income-related reimbursements (mostly within divisions such as investment banking, markets and asset management) that showed a large increase. IT costs comprised just over 20 per cent of the major banks[12] total costs in 2000, which is a marginal increase on 1999. However, personnel costs are still the largest cost item by far, and comprised just under 54 per cent of the major banks' total costs in 2000, which can be compared with just over 50

12 Excluding Handelsbanken where the corresponding data was unavailable.

per cent in 1999. The banks' different business structures are clearly reflected in the large differences between them with regard to the average cost per employee (see Figure 31). Over the past year, however, the distance between the banks has diminished.

To be able to form an impression of the banks' cost efficiency it is necessary to relate costs to income. A common measure of a bank's cost efficiency is the C/I ratio. All of the major banks improved their cost efficiency during 2000, but the improvement was due rather to large increases in income rather than to reduced costs (see Figure 32). For many of the major banks there has also been a deterioration in cost efficiency during the first quarter of 2001 due to reduced income. There are considerable differences between the banks, and these have remained fairly constant during the second half of the 1990s. The C/I ratio is, of course, influenced by the business structure of a bank, and comparisons between the banks should be made with some caution.

When earnings are falling and the banks need to maintain profitability, it becomes even more important to reduce costs. Although the income-related wage costs can be expected to decline slightly when income deteriorates, a considerable portion of the banks' costs are fixed and thus difficult to adapt rapidly to a slower business climate.

Assets

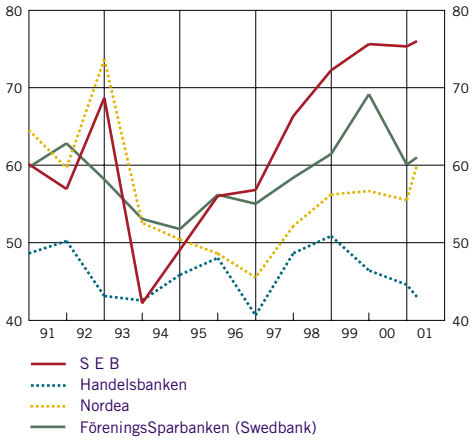
The major banks' total assets amounted at the end of 2000 to just over SEK 5,000 billion (see Figure 33). Nordea is the largest, with a balance sheet total of almost SEK 2,000 billion, while the other three major banks have assets of around SEK 1,000 billion. Almost 40 per cent of these assets are held by foreign subsidiaries or other group companies, which can be compared with less than 10 per cent in the mid-1990s.

The major part of the growth has been in connection with acquisitions and mergers, while 'organic' growth has been fairly modest.

The change is a clear indication that the growth in recent years has largely taken place outside of Sweden. It is also clear that the major part of the growth has been in connection with acquisitions and mergers, while 'organic' growth has been fairly modest. The change in level in 1997 is thus explained by Handelsbanken's acquisition of Stadshypotek and the merger between Nordbanken and Merita, while the next largest change occurred in 2000 in connection with the merger between MeritaNordbanken and Unidanmark, as well as S E B's acquisition of BfG.

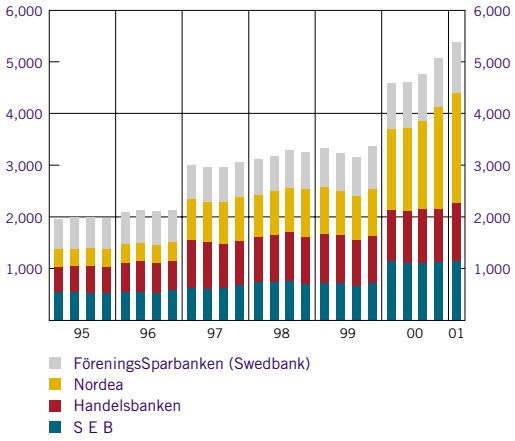
Bearing in mind the change the major banks have undergone during the 1990s, the composition of their assets during the same period has changed surprisingly little (see Figure 34). Although lending has declined, from having comprised around 70 per cent at the beginning of the 1990s to around 60 per cent today. However, this change can largely be explained by the new accounting regulations

Figure 32. Costs before loan losses as percentage of income (C/I ratio). Per cent



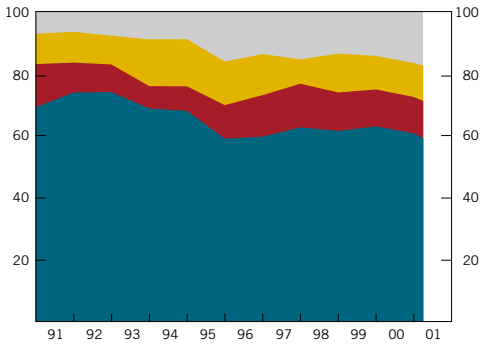
Source: The banks' reports.

Figure 33. Total assets. SEK million



Sources: The banks' reports and the Riksbank.

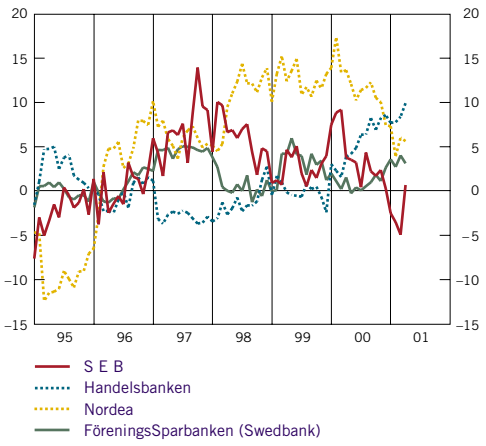
Figure 34. Breakdown of assets in the major banks. Per cent



Note. The new accounting regulations introduced in 1996 are here applied with effect from 1995.

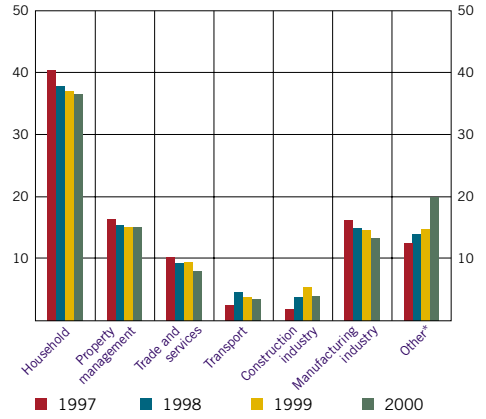
Source: The banks' reports.

Figure 35. Lending to the Swedish general public by the major banks. Annual percentage change



Source: The Riksbank.

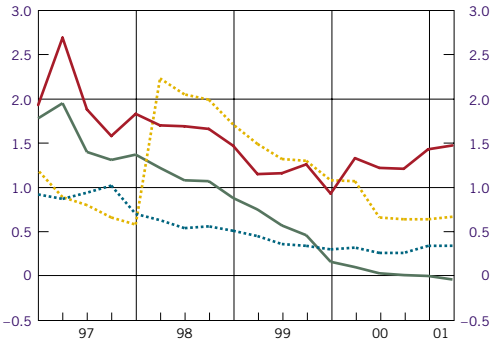
Figure 36. Lending by the major banks. Sector breakdown in per cent



Note. Excluding Handelsbanken where no comparative data was available.
* Includes forestry and agriculture, finance sector excluding banks, shipping and municipalities.

Source: The banks' reports.

Figure 37. Problem loans. Percentage of lending to the general public



Sources: The banks' reports and the Riksbank.

introduced in 1996.[13] After that the changes in the composition of assets have been primarily marginal. The banks' holdings of interest-bearing securities have declined somewhat since the mid-1990s, in favour of interbank lending and "other assets". The increased interbank lending during the same period is probably the effect of a generally higher level of activity on the financial markets as the result of the economic upswing, while the growth in other assets is explained by the fact that the major banks' business activities have become increasingly diversified. The majority of the other assets are related to life insurance and property and liability insurance operations, but also includes derivative contracts, as well as shareholdings and property.

LENDING

Historically, credit problems in the banking sector have often been preceded by a rapid expansion in lending. As in the case of total assets, the organic increase in lending by the major banks has been fairly modest in recent years. It is on the whole fairly difficult to distinguish any clear trend, although all of the major banks have shown positive growth figures during the past five quarters.

With regard to the major banks' lending to the general public in Sweden, the picture is rather more fragmented (see Figure 35). Nordbanken and Handelsbanken have shown an average annual rate of increase of almost 10 per cent over the past year, while the corresponding growth rate for S E B and Swedbank amounts to just under 4 per cent. Given that the total increase in lending in Sweden has averaged around 8 per cent over the past year, the major banks' increase in lending does not appear remarkable. Instead, it is mainly minor players, such as local savings banks, niche banks, insurance companies and foreign banks that are responsible for the largest rates of increase.

A sector breakdown of a credit portfolio can be used as a rough measure of the degree of diversification. At the end of 2000, households comprised just over 35 per cent of the major banks' credit portfolio, which is a reduction since 1997 when the same percentage was more than 40 per cent. The total percentage of exposure to the property market (property management and construction industry) has remained relatively unchanged, at around just below 20 per cent, over the past four years. The explanation as to why the percentage of "other" has increased most over the past year is that sectors, which before were less important, have grown in significance during the period through acquisitions.

ASSET QUALITY

The percentage of problem loans and loan losses with respect to total lending is a simple, albeit imperfect, measure of credit quality in a bank.[14] Both measures refer to deterioration in credit quality that has already occurred and thus contain no information on the

13 The new regulations include an obligation to report repurchase agreements and derivative contracts at their positive market value.

14 Problem loans and loan losses are defined in accordance with the banks' reports. Problem loans are the total of doubtful claims after reserves have been made and interest-reduced claims. Loan losses here refer to the gross level, i.e. write-downs and provisions before reversals and recoveries.

probability of further losses. On the other hand, the measures can be used to illustrate what impact changes in the macroeconomy have had historically, which means that these measures do give an indication of how credit quality in the banks could develop given a particular macroeconomic development.

The percentage of problem loans shows a relatively large spread between the major banks, but generally lies at a low level (see Figure 37). With regard to developments over the past year, it can be seen that the level is largely unchanged, although some of the banks have shown marginal increases over the past two quarters. S E B reports the highest percentage of problem loans, which is partially explained by the higher level in its German subsidiary BfG.[15]

The large differences in levels are partly explained by the fact that the banks apply different loan loss reserve ratios.[16] By providing for the larger part of the doubtful claims, the number of problem loans will be lower, all else being equal, while the reported loan losses will be higher. With regard to loan losses, the spread between the banks is lower but even here it is Swedbank and Handelsbanken that demonstrate the lowest levels (see Figure 38). It can be concluded that the loan loss level fell once again during the first quarter, after having risen in all banks during the fourth quarter.

To summarise, in an international comparison the Swedish economy has been characterised by very low loan loss levels in recent years. This situation has favoured Handelsbanken and Swedbank, which have less of a foreign element in their assets than S E B and Nordea.

An increase in bankruptcies in accordance with the risk scenario would be noticeable in terms of profitability but would scarcely threaten stability.

An increase in bankruptcies in accordance with the risk scenario (see Chapter 1) of 50 per cent over the coming year would lead to an increase in loan losses of almost 40 per cent, given the historical context. This type of increase would involve annual loan losses of around SEK 3.5 billion, which although they would be noticeable in terms of profitability, would scarcely threaten stability, given that the major banks have a capital base of almost SEK 270 billion.

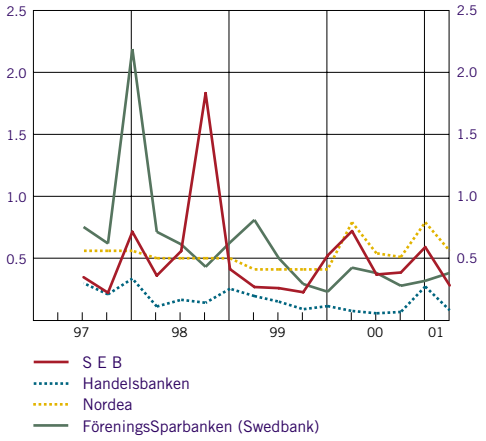
Financing

The structure of the major banks' financing has not changed appreciably in recent years. As on the assets side, the category "other", which mainly consists of insurance-related liabilities and derivative contract, has increased slightly. Deposits have also increased in significance, albeit marginally, at the cost of interbank financing.

15 The fact that BfG had a relatively high percentage of problem loans was known to S E B at the time of acquisition and was thus reflected in the price. Excluding BfG the percentage of problem credits at S E B amounts to around 1 per cent.

16 FöreningsSparbanken has a loan loss reserve ratio of more than 100 per cent, which is considerably higher than in the other banks, where the level is between 50 and 70 per cent. This high ratio is due to FöreningsSparbanken applying standard reserves in certain foreign subsidiaries.

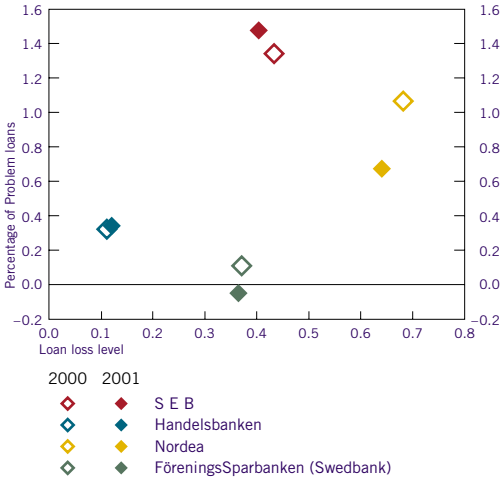
Figure 38. Loan losses, gross.
Percentage of lending to the general public



Note. For Nordea the period 1997–1999 refers to annual levels.

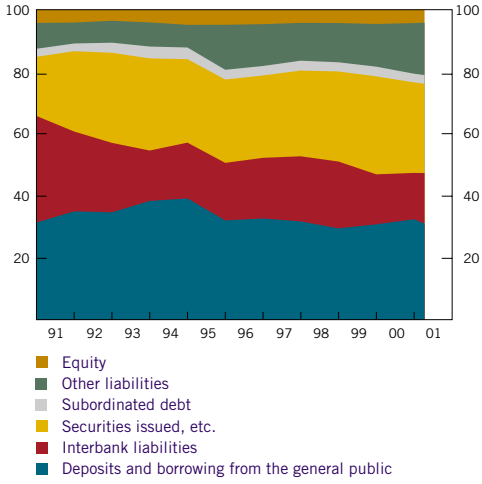
Sources: The banks' reports and the Riksbank.

Figure 39. Loan loss level and percentage of Problem loans in March 2000 and 2001.
Percentage of total lending



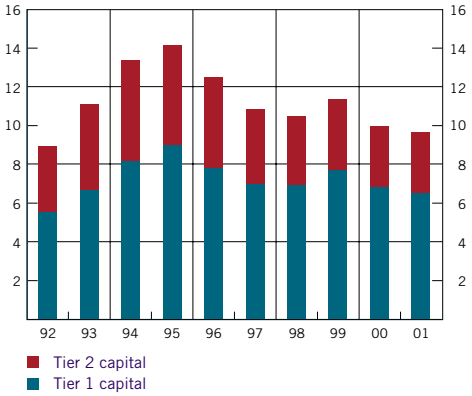
Sources: The banks' reports and the Riksbank.

Figure 40. Financing structure in the major banks.
Percentage distribution



Source: The banks' reports.

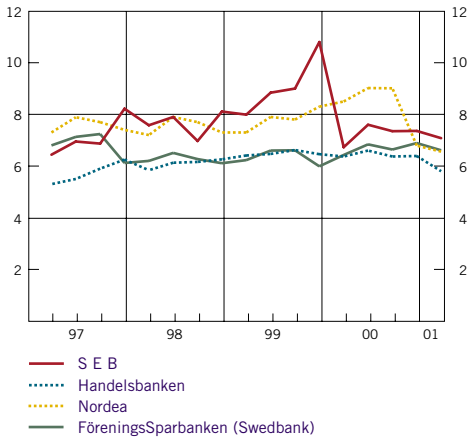
Figure 41. Capital adequacy and Tier 1 capital ratio in the major banks. Per cent



Note. The data for 2001 refers to March.

Source: The banks' reports.

Figure 42. Tier 1 capital ratio. Per cent



Sources: The banks' reports and the Riksbank.

EQUITY

Capital adequacy among the major banks amounted to 9.6 per cent in March 2001 (see Figure 41), which can be compared with almost 10 per cent during the previous quarter. Over the past four-year period, capital adequacy has roughly been in an interval between 10 and 12 per cent. During the same period, Tier 2 capital has gradually declined in importance and now amounts to just over 3 per cent of the risk-weighted assets, which can be compared with more than 5 per cent in 1995. The positive developments in profits in recent years are probably one of the reasons for the banks' reduced used of Tier 2 capital.

The Tier 1 capital ratio in the major banks amounted to 6.5 per cent in March 2001. For all of the banks the Tier 1 capital ratio has remained more or less unchanged over the past four-year period (see Figure 42). On the two occasions that a major change has occurred, this has been in connection with structural business. In order to be able to implement a major cash acquisition, a bank first has to build up a strong cash reserve, which results in an "abnormally" high Tier 1 capital ratio. When the acquisition has then been carried out, the Tier 1 capital ratio is reduced. This pattern can be seen clearly in both S E B and Nordea in connection with the acquisitions of BfG and CBK respectively.

It can be concluded that the share buybacks made by Handelsbanken over the past quarters have not had a negative effect on the Tier 1 capital ratio, which is explained by the strong growth in profits during the period. All in all, the financial strength of the major banks is currently good.

CAN THE MARKET PROVIDE INFORMATION ON THE RISK OF A BANK FAILING?

The Riksbank's analysis in the Financial Stability Report is mainly aimed at evaluating the risk of bank failure. This is done using a broad scope of information about the banks and about macroeconomic developments. As bank failures have significance for a number of market participants, it is also relevant to assess whether there is market information available providing indications of this risk.

THE CREDIT RATING INSTITUTES' ASSESSMENT OF THE BANKS

The most obvious analysts of the risk of bank failure are the credit rating institutes that give credit ratings for the banks. Although the credit rating provides overall information on a bank's creditworthiness, it has a number of shortcomings. Foremost among these is probably the fact that the rating tends to be changed too late. It has been demonstrated under several bank crises that the banks' credit ratings were not adjusted until the crisis was a fact. This happened, for instance, during the Swedish bank crisis at the beginning of the 1990s.

The information in various prices for securities issued by the banks could provide a better indication of the risk of bank failure, as it reflects immediate changes in the assessment made by those who really have financial risks towards a bank.

THE STOCK MARKET'S ASSESSMENT

The development of the share price should in principle reflect all of a company's expected future profits. Large fluctuations, high volatility, in the share price could imply increased uncertainty regarding future profits and thereby indicate a higher risk. However, stock market information says more about a bank's expected profitability than about the risk of failure and it is difficult to directly translate the share price into a usable indicator of the risk of failure.[17] It is possible to estimate implied probability distributions for the share price on the basis of *option prices* for bank shares and use them in risk assessment. The shape of the probability distribution provides an indication of market participants' expectations of the future develop-

17 Nevertheless, KMV's model for calculating the probability of bankruptcy, which is used in Chapter 1, does precisely this, i.e. uses the share price to calculate the risk of failure. However, the model is not as appropriate for banks as for non-financial companies, which is mainly due to the fact that the banks' balance sheets largely consist of financial assets and liabilities.

ment of the share price over the next few months, i.e. whether they believe in an unchanged, rising or falling share price.[18]

THE FIXED INCOME MARKET'S ASSESSMENT

Banks issue a number of instruments on the fixed income market, whose prices might provide information on the risk of bank failure.

The prices of fixed income securities issued by banks, i.e. the prices of *notes and bonds*, should give some indication of the risk of bank failure as the buyers of these securities are bearing credit risk with regard to the banks. To measure the credit risk of a security, the interest rate is normally compared with the interest rate on a government security with the same time to maturity. The larger the difference, the greater the risk. The difference in the rate is due to a government bond with a certain maturity being perceived as less of a risk in terms of credit and liquidity than a bank security with the same time to maturity.[19] Government-issued securities are perceived as a risk-free investment in principle, while bank securities have both a liquidity premium and a credit risk premium. For the interest difference to actually reflect the market's assessment there needs to be a reasonably functioning market. However, the Swedish bank bond market is relatively undeveloped (partly because many investors retain bank securities until they mature) and the quality of the information in the prices can thus be questioned. This applies to both the Swedish market and the trading of Swedish bank securities in the international market.

Another measure of the banks' risk of failure could be the *mortgage spread*. This is the difference between the interest rate on mortgage bonds and the interest rate on government securities. As the mortgage institutions are part of the large bank groups, the financing cost for the mortgage institutions can possibly be seen as an indication of the risk throughout the entire bank group. As mortgage bonds were sold under a common name, the mortgage spread was previously more an indicator of the risk throughout the entire banking sector.[20] Now it is more a rough measure of the risk in individual banks.

18 For a more detailed presentation of the information in option prices, see Aguilar J and Hördahl P, Option prices and market expectations, Sveriges Riksbank Quarterly Review, 1999:1.

19 Credit risk refers to the risk that the borrower will not manage to pay off his debts. Liquidity risk means the difficulty in divesting oneself of a security on the market as a result of little or no trading activity.

20 Previously, there was trading in MBBs (Mortgage Benchmark Bonds) where several institutes issued bond loans with in principle the same coupon and time to maturity. They were marketed under a joint designation.

The *swap spread* can be used as an indicator of the risk level in the entire banking sector.[21] The swap spread is the difference between the fixed rate in a fixed income swap[22] and the government bond rate for the same duration. It provides an estimate of the market's pricing of the difference in credit risk between the banking sector and the central government. The fixed rate in a fixed income swap reflects the government bond rate plus a risk premium. The size of the risk premium depends on the probability of failure by the counterparty during the duration of the agreement. The recipient of the fixed income payments is affected, as this party must enter into a new swap agreement at a new rate. As the terms of a new swap agreement are unknown at the time of signing the agreement, the recipient demands compensation for this interest rate risk. The swap market is well developed and can provide an indication of the market's assessment of the entire banking sector. However, the swap spread is not an indicator of an individual banks' credit risk, as the pricing is in practice general to all banks.

EXPERIENCES DURING THE 1990S

The market participants' assessment of the mortgage institutions' credit risk, measured as the difference between the interest on a five-year mortgage bond (Stadshypotek) and the five-year government bond-rate, have varied over time. As early as autumn 1989 the mortgage spread began to increase, albeit from a very low level. During the finance crisis and the economic downturn at the beginning of the 1990s, loan losses among Swedish mortgage institutions increased, which resulted in a lower credit rating and thus an increased spread between mortgage bonds and government bonds (see Figure B1). The swap spread also increased markedly during this period. The increased spreads were probably also an indication of an increase in liquidity risk, because the market perceived the possibility of divesting Swedish securities as uncertain. During autumn 1990, when some non-bank owned finance companies announced difficulties in finding financ-

Figure B1. Spread between 5-year mortgage bond rate (Stadshypotek) and 5-year government bond rate plus 5-year swap spread.
Percentage units

Sources: Ecowin and the Riksbank.

21 The two most common explanations for this are:
1) As the banks are acting as market makers in swap agreements they are exposed to both counterparties.
2) The banks are the most important participants on the swap market.

22 A swap is an agreement between two parties to exchange future cash flows in a predetermined way. In an interest swap one party binds itself to pay a constant interest on a certain amount to the other party over a specified period. At the same time, the second party agrees to pay a floating interest on the same amount during the same period. Differing comparative advantages between the parties mean that they want to exchange payment flows. The banks often act as financial intermediaries, i.e. as middlemen between the parties.

ing, the mortgage spread increased from approximately 60 basis points to 125 basis points and the swap spread increased from 55 basis points to 130. From autumn 1991, when both Första Sparbanken and Nordbanken reported major credit losses, both the mortgage and swap spreads increased. The spreads continued to increase continuously and at the end of 1992, the same day that Sweden abandoned the fixed exchange rate, the spreads reached their highest level ever. In other words, the spreads clearly indicated that the market had long experienced an increased credit risk.

With the improvement in economic prospects and more stable financial markets, both the swap and mortgage spreads fell again. However, the mortgage spread did not fall to the low level applying before the bank crisis. However, the swapspread fell dramatically which was probably due to two things. The most important explanation is that market participants had strong expectations of falling long-term interest rates which can lead to a strong demand for obtaining the fixed interst rate in a swap agreement. Another explanation could be that market participants at the time started to have confidence in the general government guarantee for the swedish banks. The turbulence on the financial markets during autumn 1998, when Russia cancelled its payments and the US hedge fund LTCM experienced problems, once again led to rising spreads. Although these were far from the levels applying during the bank crisis, many market participants nevertheless considered that the increased interest spreads were the sign of an increase in both the credit risk and the liquidity risk.

However, mortgage spreads and swap spreads are also affected by other factors than the credit risk. Prior to the new millennium, the spreads increased once again, but this was probably more a sign of the investors' concern over deteriorating market liquidity in connection with the new millennium than of an increased credit risk. After the turn of the millennium, the spreads declined again. During summer 2000 the swap and mortgage spreads rose slightly once again, which was more due to a reduced supply of government bonds in connection with amortisation of the central government debt than to an increased credit risk among the banks. The volatility in the spreads increased considerably during the first half of the 1990s, which also indicates greater uncertainty among investors. However, the volatility has declined considerably in recent years, which would also indicate an increased confidence among market participants in the banks' and mortgage institutions' capacity to repay their debts.

SUBORDINATED DEBT

Subordinated debt comprises instruments with basically the same construction as a bond loan. Such debt has a better position than shares in the event of a bankruptcy, but a lower priority than other types of debt. The yield on subordinated debt is often higher, as the investors' opportunities to recoup their money are lower than for other creditors.

A committee of researchers evaluating the issue of regulation has put forward a proposal that would force banks to partly finance themselves by issuing subordinated debt.[23] The idea is that the rate at which the subordinated debt trades on the market should be a measure of the bank's risk, which is here also in the form of an interest spread towards government bonds. The reason why subordinated debt could be considered to function better in this context than bank bonds is that the low priority position of subordinated debt means that investors in these instruments bear a greater loss risk than the banks' other creditors. Investors who hold subordinated debt should therefore also have a strong incentive to carefully follow and review the banks' actions. An increased risk-taking on the part of the banks is unfavourable to investors in subordinated debt as the holder does not benefit from a profit, but loses the capital invested in the event of a loss.

Mandatory issuance of subordinated debt would be problematic. The information prices are expected to convey assumes that there is a well-functioning market for subordinated debt, and this cannot be enforced. It is primarily for the largest banks' debt that the volume in the market could be sufficiently large to give rise to regular trading. The Swedish banks already issue subordinated debt, but these are not subject to regular trading.

To summarise, it can be concluded that the price information available on the financial markets is useful in some cases, but that it hardly provides a satisfactory picture of the risk of an individual bank failing. The swap spread contains certain information on the credit risk in the banking sector as a whole. The mortgage spread contains information on the total credit risk in the individual bank groups and can be used as an indicator. Rising swap and mortgage spreads indicated an increased credit risk even before the bank crisis.

23 Joint Statement by a sub-group of the Shadow Financial Regulatory Committees of Europe, Japan, and the U.S. (1999) "Improving the Basel Committee's New Capital Adequacy Framework".

Counterparty and foreign exchange settlement exposures in the banking sector

Counterparty and settlement exposures in the Swedish banking sector increased in total during 2000, despite a decline at the end of the year. The banks' exposures are mainly to counterparties with good credit ratings. The concentrations on individual counterparties have declined slightly, but there are still large concentrations between banks. The Riksbank's assessment on the basis of the reported exposures is that the risks of contagion effects in the banking system are moderate. Reduced concentration, resulting in a lower systemic risk, would be desirable from the Riksbank's perspective, particularly if the number of large Swedish banks were to decline even more in the near future.

Counterparty and settlement risks arise in all areas of financial trading. The risk of credit losses as a result of exposures to banks and other financial institutes, as well as some large manufacturing companies, differs in several aspects from the banks' other credit risks. Lending to the household and corporate sectors is to a great extent more diversified and the main risk of substantial credit losses would be if a large number of borrowers experienced payment problems simultaneously. In the case of exposures to financial institutions, the probability of default is lower than for lending to households or to small and medium-sized companies. On the other hand, the risks in the form of individual exposures are more concentrated than with other lending, particularly in large, well-reputed banks and financial institutes. As exposures between banks can give rise to contagion effects if a bank experiences problems, they comprise a potential threat to stability in the financial system as a whole.

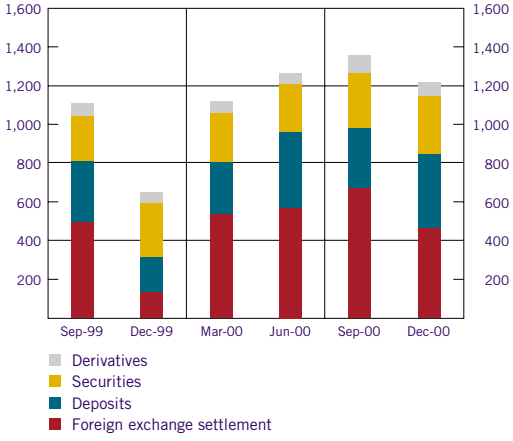
This has entailed the Riksbank gathering information from the four major banks with regard to the size of the fifteen largest individual exposures, where there is a credit without collateral; these comprise derivative exposures, holdings of securities issued by private issuers, deposits and settlement exposures in foreign exchange trading. The exposure within the three first areas has been added to achieve a total exposure per counterparty, and the fifteen largest have been ranked according to this. In addition, the banks' total exposures within each respective area have been listed. The fifteen largest exposures to settlement in foreign exchange trading have also been reported separately, with a specification of which currency pair is involved in each case. The information was collected for the first time in its current form in June 1999.

One problem with this measurement is that it only refers to exposure on a given day, which makes it difficult to draw conclusions, as it covers exposures that can change very quickly. To avoid creat-

ing too much work for the banks, the data is collected on the last day of each quarter, despite the fact that this probably entails a systematic underestimation of the size of the exposure. As the measurement has been used for one and a half years now, however, it is possible to draw a few more conclusions from the material than previously, mainly with regard to the risk of contagion effects between the banks.

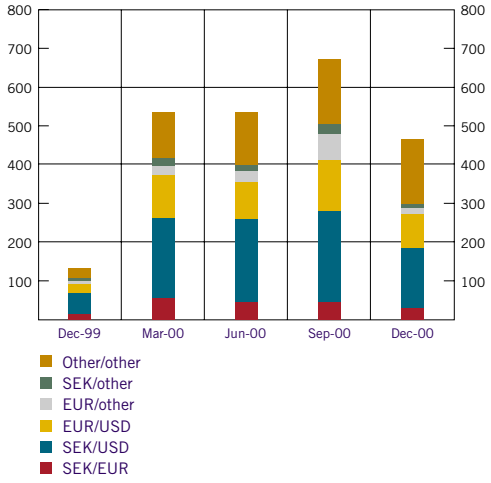
The rest of this chapter is divided up as follows. First there is an account of the development in size of the exposure during the year 2000. This is followed by a discussion of credit ratings for the Swedish banks' counterparties, and then a presentation of the concentrations of exposures between the banks. Finally, an assessment is made of the size of recovery needed to ensure that losses in the event of default will not cause contagion effects.

Figure 43. Counterparty and settlement exposures. SEK billion



Source: The Riksbank.

Figure 44. Foreign exchange settlement exposure, breakdown by currency pairs. SEK billion



Source: The Riksbank.

Developments during 2000

A minor increase in exposure could be noted during 2000. At the end of the year, the total exposures amounted to SEK 1,219 billion for the four major Swedish banks.

Deposits and *securities* have been at roughly the same level at each point of measurement, with the exception of the turn of the millennium. During the past year, the exposures in deposits (between SEK 270 billion and SEK 390 billion) were slightly larger than the exposures in the form of securities holdings (between SEK 240 billion and SEK 300 billion).

During 2000 there has been an increase in the level of *derivative exposures* (net), from approximately SEK 60 billion, to a peak of around SEK 90 billion in September 2000, whereafter there was a decline to SEK 73 billion at the end of the year, which is still a high level. Despite the increase, derivative exposures are in terms of amount the smallest part of counterparty exposures. The effect of being able to net derivative positions between two counterparties is significant; exposures in the four major banks decreased from SEK 170 billion to SEK 73 billion – by 57 per cent – as a result of netting at the end of the year. Netting implies offsetting the opposite credit positions held by two parties against one another if either of them defaults.

During the year the exposures in *foreign exchange settlement* have varied between SEK 465 billion and SEK 670 billion, with the lowest exposure at the end of the year. This is probably due to the fact that the exposures are regularly reduced at the year-end closing. The major difference between the end of 2000 and earlier occasions during the year 2000 is that foreign exchange settlement between SEK/EURO, EURO/USD and SEK/USD was lower than previously (see Figure 44). It may be interesting to note that the foreign exchange settlement exposures have never before been as large as they were in September 2000.

The counterparties' credit ratings

Possibly the banks' primary means of managing their counterparty risks is to expose themselves to counterparties with a high credit standing. One method of judging this is to study Standard & Poor's and Moody's credit ratings for the respective counterparty.[24] The credit rating provides an indication of the risk of default in an individual counterparty.

The Swedish banks' counterparties have a good credit rating, according to the counterparty statistics.

The Swedish banks' counterparties have a high credit rating, according to the counterparty statistics. At the end of the year, they had an average credit rating of A1/A+, which roughly corresponds to the Swedish major banks' own ratings (see table 2). [25]

In the main, the banks have exposures to counterparties with credit ratings from A and higher (see Figure 45). The reported counterparties that have no credit rating do not necessarily comprise greater credit risks than those with credit ratings.[26] The credit ratings represented among the counterparties confirm that the banks are trying to limit the credit risk in their counterparty exposures. The credit quality of the banks' fifteen largest counterparties has been fairly stable since gathering of the data began.

Table 2. The credit ratings of the major Swedish banks

	Moody's	Standard&Poor's
FöreningsSparbanken (Swedbank)	Aa3	A
Nordea (all of the banks in the group)	Aa3	A+
S E B	A2	A–
Handelsbanken	Aa2	A+

Source: Moody's and Standard&Poor's.

The counterparties not among the fifteen largest should on average have a lower credit rating, but on the other hand these exposures are small in terms of amount. At the end of 2000 no reported counterparty rated as number fifteen had an exposure exceeding SEK 1 billion.

The percentage of Swedish counterparties in relation to foreign counterparties varies considerably according to bank and over time. There is no clear difference in the average credit rating between the Swedish and foreign counterparties. However, there could be a "qualitative" difference between exposures to foreign counterparties and domestic counterparties respectively, in that there is greater knowledge of the domestic counterparty. One counteracting fact is that

24 The scale, in descending order, is as follows for Moody's: Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3 and Caa. The corresponding scale for Standard&Poor's is: AAA, AA+, AA, AA–, A+, A, A–, BBB+, BBB, BBB–, BB+, BB, BB–, B+, B, B– and CCC.

25 The credit ratings shown by the Swedish major banks' most important counterparties indicate that the probability of default within one year's time is slight. According to Standard&Poor's and Moody's statistics, the bankruptcy frequency for a company with an A credit rating during the period 1980 to 2000 was on average around 0.05%.

26 A credit rating is needed in particular if the company intends to borrow directly on the capital market.

all of the foreign counterparties tend to have a credit rating, which is not the case for the Swedish counterparties.

Concentrations between the banks

The banks can also reduce the risks by setting limits as to how large an exposure they are willing to incur against other banks.

A basic rule-of-thumb for the Riksbank is that the Swedish major banks should be able to manage a sudden default among one of their most important Swedish or foreign counterparties, without suffering such substantial losses that they would threaten the bank's survival. The repercussions of a rapid default could be considerable, as the banks would not have time to reduce their exposures to the bank in question. On the other hand, with a more prolonged sequence of events the banks would have time to reduce their exposures, before the bank with problems finally defaulted.[27]

The risk of contagion effects in the banking system varies, depending on which of the four major Swedish banks the potential problem originates from.

In the Swedish banking system there are differences in the level of exposure that a bank allows itself towards another bank. The risks of contagion effects in the banking system thus varies, depending on which of the four major Swedish banks the potential problem originates from. Furthermore, it can be noted that there may be banks outside of Sweden that could cause problems for the Swedish system.

Common counterparties

The banks' reported exposures to one another can provide guidance as to how any contagion effects could be transmitted throughout the banking system. If several banks have exposures to the same bank, the systemic risk is increased. The choice of foreign counterparties may reduce the direct connections between the Swedish banks, which could reduce systemic risks.

There would be a significant problem if the Swedish banks used the same counterparties to an overly large degree.

There would be a significant problem if the Swedish banks used the same counterparties to an overly large degree. The Riksbank regularly receives statistics with regard to the 15 largest counterparties of the respective major banks. These could thus consist of a maximum of 60 counterparties. In reality the number varies around 40 (see Figure 45).

27 The rating companies have sometimes been accused in the general debate of being too slow in downgrading companies, e.g. during the Asia crisis. The effect of not downgrading companies is that the bankruptcy frequency for a given credit rating increases, which can also be seen in the statistics from the rating companies.

At the end of the year, there was no single counterparty to which all four of the major Swedish banks had exposures at the same time, which has been the case previously (see Figure 46). However, there were a number of counterparties during 2000 towards which two or three of the four major banks had exposures.

The banks are not aware of their competitors' choice of counterparties and the number of counterparties that might comprise a potential threat to the Swedish banking system cannot be observed by the banks themselves.

The banks are not aware of their competitors' choice of counterparties and the number of counterparties that might comprise a potential threat to the Swedish banking system cannot be observed by the banks themselves. The banks expose themselves to the risk of being affected both directly and indirectly by a common counterparty's problems. The indirect problems would arise in that other counterparties would be affected by losses from the common counterparty, which could spread back to this bank.

The counterparties to which all four major Swedish banks have been exposed at the same time include only foreign counterparties, mainly large banks with international operations. The counterparties to which two or three Swedish banks have been exposed include the major Swedish banks, other Nordic banks, international banks and a number of large corporations.

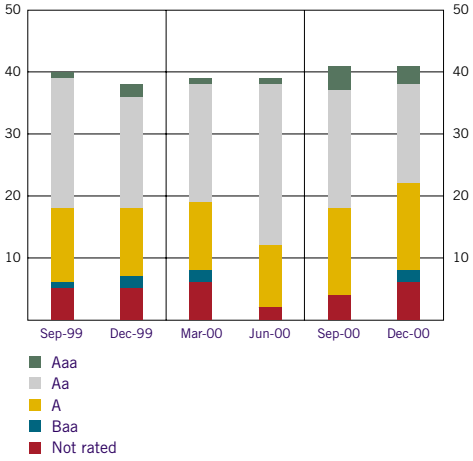
The risk of contagion effects between the banks

Problems in a major Swedish bank would certainly affect the international view of the entire Swedish financial sector. This type of confidence crisis for the sector would result from concern regarding contagion effects between the parties in the system. The discussion below aims to provide a picture of the contagion risks existing between the Swedish banks.

In the event of a default in one of the Swedish banks, there is a slight risk of a sequence default occurring. A sequence default could occur if one or several other Swedish banks suffered such large losses that the size of their capital was reduced below the legislated levels.[28]

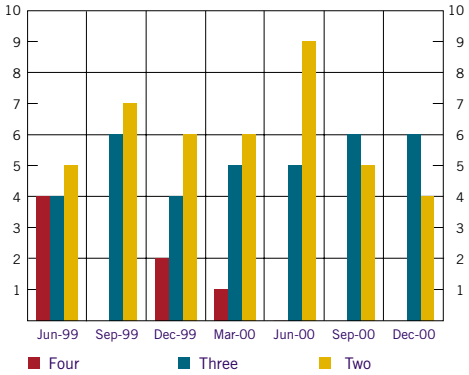
Since summer 1999, when the banks first began to report their counterparty and settlement exposures, there have been a number of cases where a Swedish bank has had such substantial exposures towards another Swedish bank that there has been a direct risk for contagion. In such cases it is only if almost the whole of the exposed amount were lost that the exposed bank's capital would actually decline sufficiently for a contagion to occur. With a recovery

Figure 45. The major Swedish banks' counterparties. Number and credit rating



Source: The Riksbank.

Figure 46. The number of major Swedish banks exposed to the same counterparty at the same time.



Note: As an example, in June 1999 there were four counterparties to which all four major Swedish banks were exposed. In March 2000 there were only one counterparty to which all four were exposed.

Source: The Riksbank.

28 The assumption is that the bank's Tier 1 capital ratio must be below 4 per cent in order for a contagion to take place from one bank to another.

level of 15 to 20 per cent of the exposure, it is possible to avoid contagion between the banks, in one case a recovery of 40 per cent would have been necessary.[29]

An important restriction in the interpretation of these calculations is that the risk of contagion between the banks is probably greater in between the quarter endings, when exposures are likely to be larger than those reported.

The discussion pursued by the Riksbank in this Financial Stability Report and in previous issues regarding the size of counterparty and settlement exposures and their related contagion effects has been mainly aimed at the risk of loan losses. This is a discussion on the basis of whether the banks' reported income and, ultimately, their solidity can be affected by a counterparty cancelling payments. Such failed payments will also affect the bank's liquidity in that the bank will not have access to a payment it has expected to receive. As a large part of the exposures are very short-term, often merely a day or so, the amount of failed payments could become substantial.[30] However, the Riksbank has not made any assessment as to how serious this type of strain on liquidity would be. A general discussion on liquidity risks in the banks follows in the next chapter.

The counterparties' relatively good credit standing indicates a low probability of a sudden default affecting a counterparty. In the event of a default occurring, it is only major losses with a low degree of recovery that could lead to a spread from one Swedish bank to another bank. The risk of contagion effects between the banks is thus relatively slight. A potential proliteration of problems from one bank to another within the system could, however, be very serious and threaten financial stability.

The Swedish banks' reported exposures towards one another show that there are clear differences in the size of the exposures the banks' allow themselves to have against one another.

The Swedish banks' reported exposures towards one another show that there are clear differences in the size of the exposures the banks' allow themselves to have against one another.

Increased transparency regarding the size of counterparty and settlement exposures and how the banks view the risks in these exposures could lead to a change in the market's view of the risk of problems spreading between the banks.

Improved systems for the settlement of foreign exchange and securities could also contribute to lower exposures in the market. The Riksbank has earlier pointed out the advantages of, for instance, the CLS Bank, and has requested that the Swedish krona should be included in the second wave of currencies, even if this is only for a transition period in the case of Sweden later joining EMU.

29 According to a survey of American data carried out by Moody's, recovery on *senior unsecured bank loans* was just over 50 per cent, but with large variations from one case to another. In the event of a cancellation of payments, all counterparty and settlement exposures would become unprioritised claims and could thus be assumed to have approximately the same degree of recovery.

30 This applies primarily to deposit and foreign exchange settlement exposures, and these normally comprise the majority of the largest exposures.

Liquidity and liquidity risk

The banks can suffer a shortage of liquid funds for a number of different reasons. One is failings in their internal liquidity management, which could lead to the bank being unable to find sufficient liquid funds to meet its payments. Another is a breakdown in the payment system, which could mainly be caused by extensive computer problems. There is also a risk that liquidity on a market central to the banks' financing could decline or disappear. Finally, a shortage of liquid funds could be a sign that the bank has, or is perceived to have, solidity problems. To summarise, the Riksbank assesses that the risk of liquidity problems forcing a major Swedish bank to default is relatively slight, as long as this does not happen in connection with the bank facing solidity problems.

The banks' traditional role involves receiving deposits and lending out its money for consumption and investments. As a depositor usually has the right upon request to immediately withdraw the money on deposit in his/her bank account, deposits are exceedingly liquid. On the other hand, the banks' lending to its borrowers is extremely *non-liquid*. A bank cannot easily sell one of its loans without giving a substantial discount. This is because the bank possesses special information on a borrower's capacity to pay, which makes it difficult or costly for an outsider to evaluate the risk involved in the loan. The difference in transitoriness of deposits and lending means that liquidity becomes a central concept in every bank, and it has traditionally been regarded as a fundamental issue for all bank operations.

The banks also have a central task in the payment system, as their participation is required to enable almost all payments of goods and services.

The banks also have a central task in the payment system, as their participation is required to enable almost all payments of goods and services. Payments can be made through transfers between accounts or by using banknotes and coins, and in both of these cases the banks are involved at some stage. The need for liquid funds to execute payments forms the basis of the banks' liquidity management. In practice, it is the variation in customers' payment patterns that occasions major changes in the banks' liquidity requirements.

Individual banks can thus have large fluctuations in their liquidity requirement. These fluctuations are due to the payments made between banks in the Riksbank's RIX system, and which largely

reflect the bank customers' payment patterns. All payments from one bank to another are made via the RIX system.[31] As the increased turnover on the financial markets increases, the turnover in the RIX system has also increased and currently amounts to approximately SEK 450 billion a day.

It would be very costly for the banks to maintain such large liquidity reserves that they could themselves manage to execute all of the necessary payments on their own behalf and on behalf of their customers. One condition for the RIX system to work well is a continuous flow of payments between the banks, so that incoming funds can be used to execute each bank's own payments. In addition, the Riksbank supplies credit during the day. This 'intraday' credit is interest-free, but collateral must be provided in securities approved by the Riksbank. The banks currently hold securities corresponding to between SEK 60 billion and SEK 80 billion pledged to the Riksbank for the purpose of being able to execute their payments.

The banks are also able to borrow from the Riksbank at a certain interest rate, or to make deposits, from one day to the next, but they try to even out their positions between themselves at the end of the day, with banks that have a deficit borrowing from banks that have a surplus. To encourage this process, there is an interest-rate spread of 1.5 percentage points between the Riksbank's deposit and lending rates. When the banks loan from one another, they apply a rate that lies within this interval. These interbank credits are known as overnight loans, and normally run overnight, to be paid back the following morning.

To summarise, there are two important aspects of the banks' daily liquidity planning directly connected to the Riksbank's payment system – the banks' payment flows and their stock of eligible assets.

To summarise, there are two important aspects of the banks' daily liquidity planning directly connected to the Riksbank's payment system – the banks' payment flows and their stock of eligible assets.

31 See "Settlement of payments in the RIX system", Sveriges Riksbank, 2000.

WHAT IS LIQUIDITY?

Liquidity refers to access to means of payment, i.e. means that can be used to execute payments. The Riksbank's banknotes are legal tender, but deposits in the Riksbank also comprise a means of payment for the banks. Similarly, the general public can use funds in their deposit accounts to make payments.

The *liquidity* of an asset depends on how quickly and at what cost it can be converted into a means of payment. Cash balances are completely liquid, as are deposits, under normal circumstances. A government security is less liquid than cash, but it is still a fairly liquid asset as it can be converted to cash or a deposit quickly and at a low cost. Other financial or non-financial assets can also be converted into a means of payment if there is sufficient time and the seller is prepared to accept the price a buyer is willing to pay. If the asset needs to be converted rapidly, the seller could need to reduce the price in relation to what the asset is considered to be worth to bring about a sale. An asset that can be difficult to sell, or where the price may vary, is thus less suitable as a liquidity buffer.

The liquidity of an asset also depends on the functioning of the market for buying and selling that asset. On a market where the participants act by setting buying and selling prices for assets, the difference between the buying price and the selling price, known as the spread, acts as a measure of the liquidity of the asset. The asset cannot be exchanged for a means of payment and then exchanged back again without the spread giving rise to costs. An asset that is traded with a smaller spread gives rise to a lower cost and is thus more liquid. The stability of the size of the spread over time also has significance for the liquidity of the asset.

For the type of assets in which there is organised trading, the concept of *market liquidity* is often used in financial economic theory (the market micro-structure field). This concept refers to the capacity to sell a large volume of an asset on the market with little effect on the price. Market liquidity can be described in three dimensions: width, depth and resilience. Width refers to how far the prices move from the average price and is measured, for instance, as the difference between the buying price and the selling price. Depth refers to the trading volume the market can manage without changing the prevailing price. Resilience refers to the speed at which price fluctuations occasioned by trading abate, or at which imbalances in the order flows are adjusted.

The market for certain assets can consist of a few participants and the price is then an object for negotiation. This applies, for instance, to many bank credits; the only potential buyers being other banks. This type of asset is usually less liquid than the assets traded on a market with many buyers and sellers.

Nevertheless, the liquidity of an asset is not merely dependent on the possibility and cost of selling the asset, but also the possibility to raise money on it. The cost of raising money on an asset can be lower than the cost of selling the asset and buying it back. Thus, the spread need not comprise an unequivocal measure of the liquidity of an asset. By supplying loans against collateral to households and companies, banks and other financial companies supply liquidity.

Lending against collateral involves a lower credit risk to the lender than lending without collateral, which means that the interest rate is lower on this type of lending. For instance, households can borrow money at a cheaper rate if they have a home to mortgage and the banks can normally borrow at a lower rate on the repo market than on the call money market. However, as holding collateral can involve costs, it is not self-evident that the total cost to a bank is lower with repo financing.

A company's *liquidity management* is aimed at ensuring that the company has sufficient means of payment at each point in time to meet its payment commitments. The company's capacity to manage this depends on how well it can predict the payment requirements that will arise from inward and outward payment flows, on market liquidity for the assets held by the company and on the company's conditions for borrowing funds.

Liquidity management in the Swedish banks

All of the four major Swedish bank groups have internal guidelines for how liquidity should be managed within the group. They have fairly similar methods for liquidity management, although there are some differences. The differences between the banks are often based on the fact that different focuses for their operations lead to different demands for the need to have measures and methods to effectively manage liquidity. For instance, the percentage of assets in foreign currency varies between the bank groups, which means that there are differences in liquidity management for various currencies. There are also differences in the level of sophistication of the banks' liquidity management.

The first stage in liquidity management involves assessing the size of the incoming and outgoing payment flows. Expected deficits in these flows must be funded at the lowest possible cost, while surpluses must be invested at the best possible return. The timing of certain transactions is well known, while others need to be forecast. For instance, it can be difficult to know whether a loan that falls due will be extended or how the customers' payment patterns look.

Liquidity management is based on forecasts of payment flows for various time horizons. The longest forecast horizon is normally around 30 days, while the shortest is for the same day. The purpose of this is to be able to identify possible deficits (or surpluses) at the earliest possible stage, as it is normally possible to find cheaper funding or to change the funding requirement if there is enough time. The banks' alternative opportunities for covering their liquidity requirements decline over time. Most long-term liquidity planning is required to enable the bank to be able to use subordinated debt, bonds or notes. When there is less time available, these instruments can no longer be used and the bank is forced to use, for instance, repos or intraday loans. The fastest means of all of finding liquidity, and the only means that can be used with in principle no time delay at all, is to borrow from the Riksbank. However, the choice of funding method is not merely governed by the time horizon for the funding requirement, it is also affected by the costs involved. For instance, a bank may choose to issue notes or bonds if the price is considered beneficial, even if it has no liquidity requirement at the time of the issue.

Liquidity limits are set to ensure that operations do not create large deficits of liquidity during a given day. These limits are set for the group as a whole, and then broken down into operations that can affect the need for liquidity. The limits thus become an important management instrument with regard to funding the bank at a low cost.

All of the four major banks have an internal bank that steers liquidity flows. The means of steering are the internal price of liquidity, the internal rate. This rate affects how profitable it is for the different parts of the bank to borrow or invest when they have a liquidity deficit or surplus. The role of the internal banks is thus to steer liquid funds from the parts of the bank with a surplus to the parts with a deficit. In several of the groups there is a policy to invest liquid funds in the internal bank. The mortgage institutions are large recipients of means of payment in kronor. In recent years,

these have had a need for increased liquidity to be able to fund the increasing percentage of housing loans at a variable interest rate.

The banks need to maintain a liquidity reserve of a certain size in order to be able to manage unexpectedly large liquidity outflows. This reserve consists of securities than can be pledged, repoed out or sold in order to create almost immediate liquidity. All of the major banks regard the assets that can be pledged in the Riksbank as fully liquid. Other types of assets are then broken down by the banks according to how liquid the bank considers them to be.

Management of liquidity in foreign currency mainly uses the same methods as management of liquidity in kronor. One difference is that the Swedish banks usually do not have access to accounts in foreign central banks. As long as the bank can find sufficient liquidity in kronor, it is always possible to create liquidity in other currencies by exchanging on the foreign exchange market. However, the price of finding liquidity in another currency may vary if the liquidity in the foreign exchange market deteriorates (see the discussion in the next section) or through a change in the exchange rate of the currency concerned.

Risks connected with liquidity

There are several reasons as to why a bank may experience an unexpected need for liquid funds. This section discusses four potential causes of liquidity problems. The first two derive from operational risks, both in connection with liquidity management and in the form of technical problems in the payment system. A possible third cause of liquidity problems is a shortage of liquidity in the market for various financial instruments. Finally, confidence problems can lead to a bank's depositors and other financiers withdrawing their money or reducing their limits towards the bank in question.

OPERATIONAL RISKS IN PRACTICAL LIQUIDITY MANAGEMENT

Regular liquidity planning is primarily aimed at management of the liquidity requirements that can arise in the bank's normal operations. There is an uncertainty in the forecasts of how large the actual liquidity requirement will be, which is due to the fact that unforeseen events can occur, such as unexpectedly large outflows as a result of problems experienced by a counterparty or large customer. It is only possible to survey the difference between unexpected outcome in the forecasts and more systematic miscalculations if the uncertainty in the forecast is followed up in a structured way. The Riksbank's interviews with the banks have indicated that there is no structured follow-up of these forecasts.

Possible systematic errors in the forecasts are examples of operational risks in liquidity management that could be reduced if they were followed up.

Possible systematic errors in the forecasts are examples of operational risks in liquidity management that could be reduced if they were followed up.

An alternative method of dealing with the uncertainty in the requirement for liquid funds is by absorbing the effects of unexpected events through holding larger reserves of securities or other liquid assets. The Swedish banks hold relatively large stocks of assets that could be mortgaged to deal with any sudden, unforeseen liquidity requirements when settling payments in RIX.

According to the Riksbank's assessment, it appears unlikely that miscalculations of the liquidity requirement would be so great that they risk entailing serious liquidity problems. If miscalculations arise, there is always the opportunity to borrow funds in the intra-day market, at least as long as the bank has no other problems that make lenders unwilling to supply credit. In addition, the banks hold considerable reserves of securities that can be used for unforeseen funding requirements.

OPERATIONAL RISKS IN THE INFRASTRUCTURE

The existence of operational risks in the infrastructure, for instance, the payment and information systems, lies mainly outside of the individual bank's field of influence.

Disturbances in communications between the payment or information systems could lead to an inability to execute payments, or to the non-transmittal of the information that a payment has been executed.

Disturbances in communications between the payment or information systems could lead to an inability to execute payments or to the non-transmittal of the information that a payment has been executed. A fault in the systems can afflict one individual bank or several banks simultaneously. Most banks have suffered this type of problem at some point. If the payments cannot be executed, it will not be possible to redistribute the liquidity in the system between those with a surplus and those with a deficit. For instance, problems with the Riksbank's RIX system or the TARGET system could lead to this type of problem. On the occasions when RIX has experienced problems, it has been possible to use established emergency routines and execute the payments regardless.

Problems in the SWIFT system could mean that payments are still executed, but that the payment information did not reach the sender or recipient.[32] After a day or more with a problem in the information systems, it is quite possible that a large bank could experience major difficulties in assessing its own liquidity situation and in knowing where in the group liquidity should be steered.

It can be concluded that problems in the payment system or the accompanying information system could have serious consequences for the banks. The effects of problems that have arisen so far in the computer systems have been alleviated with the aid of emergency routines. It is important to have emergency routines not only with the system administrator, but also with participating institu-

32 SWIFT (Society for Worldwide Interbank Financial Telecommunication) is a bank-owned organisation that runs a global network for exchanging financial messages. A SWIFT message could involve an instruction to transfer funds. The transfer (settlement) is then made through the payment system (in Sweden the RIX system).

tions. It is worth noting that certain types of system problems cannot be managed through liquidity reserves, as it may be impossible to utilise the reserves if the systems are down.

THE LIQUIDITY RISK IN THE MARKET

The events in connection with the LTCM and Russia crisis in autumn 1998 gave rise to discussion of what risks to the banks might arise in the event of a severe deterioration in market liquidity.[33] The turbulence on the financial markets caused liquidity in parts of the market to decline heavily. There was a particular drop in liquidity in certain derivative markets used by the banks to divest themselves of undesired risks.

However, the events of autumn 1998 had relatively little effect on the Swedish banks with regard to their funding. The banks themselves consider the effects to have been slight and one of the Swedish banks even saw positive effects for its funding situation.

The reason why the Swedish banks were not affected was that they had relatively modest exposure towards the worst-hit markets, primarily bond issued by *emerging market countries* and more complex OTC derivatives.

The reason why the Swedish banks were not affected was that they had relatively modest exposure towards the worst-hit markets, primarily bonds issued by *emerging market countries* and more complex OTC derivatives. The banks' securities holdings and derivative positions mainly concern trading in government bonds and mortgage bonds, as well as the foreign exchange market in Swedish kronor and the large currencies such as the US dollar, the euro and the yen. These markets were not affected to a great extent by the turbulence in autumn 1998.

What is meant when discussing market liquidity as a potential problem is the drastic changes in liquidity that could occur. The liquidity of an asset is determined, like its price, by the supply and demand ratio. If there are major changes in supply or demand, the price of a particular asset will change and at the same time, the liquidity of the asset will be affected. Very severe changes in the supply and demand ratio will lead to only sellers – or buyers – remaining in the market and liquidity will completely disappear, which is what happened on certain markets in connection with LTCM's problems.[34] This type of change arises mainly as a result of a substantial reassessment of the risk in an asset. Instruments that have a similar risk profile are often affected in a similar way by this type of event – there is a form of contagion effect. For instance, many bonds issued by emerging market countries were affected when Russia defaulted on its government bonds in 1998.

33 Long Term Capital Management (LTCM). An US-based hedge-fund that ran into problems in the autumn of 1998.

34 The interplay between the liquidity risk and the market risk becomes a question of how the demarcation is made between market liquidity and market. Two of the major Swedish banks do not differentiate between liquidity risk in assets and market risk; they consider all price fluctuations on assets to be market risks and measure them in the bank's VaR (Value-at-Risk).

The effects of a deterioration in market liquidity are largely beyond the banks' control. However, as with other risks in the banks' environment, the banks must maintain some form of readiness of how to deal with these problems if they arise. The methods for managing unforeseen liquidity requirement discussed in the previous section can also be used to manage this type of problem, for instance, sufficient reserves of securities that can be pledged and credit lines with other banks.

Problems with market liquidity would only comprise a threat to one of the Swedish banks if they arose on one of the markets important to the bank's funding.

Problems with market liquidity would only comprise a threat to one of the Swedish banks if they arose on one of the markets important to the bank's funding. The market for Swedish government securities is such a market, as the banks have large holdings of government securities, for funding repos and pledging in the Riksbank. Swedish mortgage bonds are also an important asset, as they can be used for pledging and repo funding. A severe deterioration in liquidity or heavily falling prices on one of these markets could primarily occur in the event of a crisis in central government finances, or if the mortgage institutions experienced solidity problems.

It is also possible to imagine that a substantial deterioration in liquidity could occur through a contagion effect, for instance, if Nordic government or mortgage bonds were to suffer severe problems. It is difficult to assess the size of the effects on Swedish bonds in this type of situation, and this would probably be largely governed by circumstance if it actually occurred.

The market on which the banks are most dependent for their short-term financing is the short international interbank market. If one Swedish bank is perceived to have solidity problems, all Swedish banks could experience problems in taking up loans in this market. This was the case, for instance, during the Swedish bank crisis. On the other hand, of course, access to and the price of long-term funding on the bond market can vary over time, which can make a bank more or less dependent on the interbank market. An excessive dependence on the short-term interbank market can constitute a problem for a bank, as the counterparties do not normally have unlimited facilities for lending to the bank in question.

The foreign exchange market is also important to the banks' funding in that it is used to exchange loans in foreign currency into Swedish kronor (the reverse can also be necessary). The market for exchanging at call or at short forward rates is very liquid and it is difficult to imagine that it would experience such large liquidity problems that it became impossible for the banks to exchange at all, or only for very small amounts, over a long period of time. A common factor in regard to liquidity problems in those markets, which are central to the banks, is that such problems likely do not occur alone. They are most likely consequences of other problems with the Swedish economy.

A shortage of market liquidity can also affect the function the banks fulfil as intermediaries for risk management products. In particular, a liquidity shortage in the derivative markets could mean that the banks were unable to divest themselves of undesired risks.

To summarise, a reduction in market liquidity would probably be more a question of the bank taking on undesired risks in its funding rather than a threat to the bank's survival.

To summarise, a reduction in market liquidity would probably be more a question of the bank taking on undesired risks in its funding rather than a threat to the bank's survival. Expressed a different way, the bank would meet with a different price for its funding because of the reduced liquidity in the market.

CONFIDENCE PROBLEMS FOR THE BANKS

In the event that the bank has or is perceived to have problems with its solidity, both deposits and borrowing can be withdrawn via what is known as a *run*. A rapid withdrawal of the bank's financing would naturally create very severe liquidity problems for the bank and could directly threaten the bank's survival. Of course, this type of liquidity crisis, which is a direct consequence of feared or actual solidity problems, is not included in the normal liquidity forecasting.

From a short-term liquidity perspective, it is not important whether a bank has an actual solidity problem or whether it is merely suspected in the market of having solidity problems.

From a short-term liquidity perspective, it is not important whether a bank has an actual solidity problem or whether it is merely suspected in the market of having solidity problems. It is often difficult for participants in the market to obtain sufficient information in a short space of time to be able to judge whether or not a counterparty actually has solidity problems. Therefore, if a bank's solidity is questioned, the bank's creditors reduce their limits towards the bank. This reduction has a rapid effect and the bank experiences difficulty in finding financing on the market.

The tendency for the banks' short-term funding to appear to move towards more overnight loans could intensify the banks' problems in the event of a crisis of confidence.

The tendency for the banks' short-term funding to appear to move towards more overnight loans could intensify the banks' problems in the event of a crisis of confidence. A run, where deposits were withdrawn is less probable today, partly because deposits are to a large extent covered by the deposit insurance.

One example of when one or more banks' credibility has fallen so low that they cannot refinance themselves in the market was what happened to the Swedish banks in 1992. Some banks were considered to have such a low credit standing that it was difficult for them to find funding during certain periods.

The Riksbank has the possibility of providing emergency liquidity assistance to banks with problems obtaining funding, i.e. acting

as ”lender of last resort”. An important criterion for the Riksbank is that this assistance should only be granted if there appears to be a threat to the financial system as a whole. Another is that emergency liquidity assistance should be used for liquidity assistance, not solidity assistance. This means that the Riksbank must assess whether the bank has any actual solidity problems, when it experiences a shortage of liquidity.

SUMMARISING COMMENTS

Of the risks described above, operational incidents in liquidity management are relatively common, but their consequences are normally limited. With regard to market liquidity, there are fewer incidents in this area but they could be more difficult for the banks to deal with. Neither of these types of risk should in itself be able to force an otherwise solid bank to default. Banks that experience a major breakdown in their infrastructure or a crisis of confidence, would appear to face a greater risk of really serious consequences arising. It is also more probable that the Riksbank would choose to supply emergency liquidity assistance in this type of situation.

Although the operating risks in the internal liquidity management and the risks related to market liquidity do not appear to be so serious that they could threaten a bank’s survival, it is important for the Riksbank to also monitor these risks, as they affect the vulnerability of the banks to other liquidity strains.

Above all, it appears that the banks could run into difficult problems if several of the above-mentioned threats to liquidity were to occur at the same time.

Special topics

The business cycle and regulations for banks

The banks' results are strongly dependent on economic fluctuations. This is only partly taken into account in the regulations governing how banking operations should be pursued. The Basel Committee on Banking Supervision is currently working on a new bank capital adequacy framework for banks.[35] This section discusses how the cyclical fluctuations in the banks' income, together with the new regulations, may affect the banks' capital adequacy requirement and credit granting. In addition, there is discussion of a special means of adapting accounting to incorporate the business cycle influence through 'dynamic provisioning'.

THE NEW CAPITAL ADEQUACY REGULATIONS

In June 1999 the Basel Committee on Banking Supervision issued a consultative paper containing proposals for a new bank capital adequacy framework. Following contributions from various consultations (primarily international players in the field of finance) and further processing by the Basel Committee, the proposals have been defined in detail. In January 2001 the detailed proposal was launched on a second round of consultations.[36]

As holding capital entails a cost to the lending bank, the bank will be more scrupulous in taking into account the relationship between the risk of an exposure and the income it provides.

The capital adequacy regulations entail that the capital adequacy ratio, i.e. the capital base in proportion to risk-weighted assets, should be at least 8 per cent. According to the current regulations the risk weights of the assets are determined by simple standards. The idea behind the new regulations is that the risk weights will better reflect the credit risk, i.e. the risk that a borrower will be unable to meet the commitments made.

As holding capital entails a cost to the lending bank, the bank will be more scrupulous in taking into account the relationship be-

35 The Basel Committee on Banking Supervision was founded in 1975 by the central bank governors in the G10 countries. The Committee consists of representatives from the central banks and supervisory authorities in Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Sweden, Switzerland, the UK and the USA. The Committee has its permanent secretariat at the Bank for International Settlements (BIS) in Basel.

36 See *A New Capital Adequacy Framework* (1999 BIS Publication No. 50) and *Consultative Document: Overview of the new Basel Accord* (2000, Basel Committee on Banking Supervision). For a description of the principles behind the proposal, see also *Towards new national and international banking regulations* by Göran Lind and Johan Molin in Sveriges Riksbank Quarterly Review 1999:3.

tween the risk of an exposure and the income it provides. There will also be a greater chance that increased risk will be reflected in the bank's pricing. This does not mean that banks will be prevented from taking risks, but that they will have a further incentive to make a thorough assessment of the risks and relate them to the expected yield.

The Basel Committee's proposal states three methods for calculating the capital adequacy requirement for credit risk: a standard method, which is to some extent based on external credit assessments made by credit rating institutes, and two internal-ratings based approaches – one "foundation approach" and one "advanced approach". An exposure's credit rating should in principle be updated regularly, whether the rating is external or internal.

However, the difficulty lies in finding methods for risk assessment that are sufficiently forward-looking. The available loss data is often restricted to a certain number of years back in time. This means that it seldom takes into account several economic cycles. In addition, the forecast horizon is often short term. There is thus a risk that future economic trends are not sufficiently taken into account, and that the methods used as a basis for awarding credit ratings thus underestimate future credit risks during times of economic prosperity and exaggerate them in less prosperous times.

When using credit risk evaluation methods that are not sufficiently forward looking, there is a risk that the credit ratings will not be changed until the new phase in the economic cycle is a fact. The new capital adequacy regulations could mean that the banks' capital adequacy requirements varied substantially during economic fluctuations.

Even under today's regulations a bank's capital adequacy ratio may decline during a weaker economic climate. This is because, if the result is sufficiently sensitive to economic fluctuations, a loss will arise that reduces capital. Thus, the *numerator* in the ratio between the capital base and risk-weighted assets, i.e. the capital adequacy ratio, also decreases.

The new regulations may reinforce this effect on the capital adequacy ratio, because the *denominator* is also sensitive to economic fluctuations. During an economic slowdown there is an increased risk that the credit rating for a given asset will decline, which may lead to an increase in the risk weight of the asset. This means that a bank with a given asset portfolio may have a lower capital adequacy ratio in total during a weaker economic climate than during a strong economic climate. There is thus a risk that during an economic slowdown the bank might find itself in a situation where it was unable to fulfil its capital adequacy requirement of 8 per cent. Banks can normally improve their capital adequacy ratio by, for instance, selling assets, withdrawing credit or increasing their own capital. However, it may be difficult for a bank to implement such measures during a weak economic climate. Borrowers are often unable to pay back credit during an economic slowdown. Taking measures aimed at withdrawing a loan risk causing the borrower to declare bankruptcy instead. It may also be difficult to obtain new capital through a new share issue, particularly if the bank has a profitability problem.

If several banks simultaneously face the problems described above, this could make an economic slowdown more severe and more prolonged. This is because the total supply of credit may decline if the capital adequacy requirement sets limits for the banks' credit granting.

A credit crunch tends to arise during a phase in the economic cycle where the economy needs stimulation.

This type of credit crunch tends to arise during a phase in the economic cycle where the economy needs stimulation. The phenomenon is usually referred to as the capital adequacy regulations' *procyclicality effect.*

The build-up of imbalances often occurs during times of good economic growth. If the credit risk is underestimated during a strong economic climate, it is possible that the bank's capital adequacy ratio does not correspond to the risks built up and that it wrongly appears to be satisfactory. During a time of economic growth, the capital adequacy requirement is low, while good results build up the bank's equity capital. This means that the capital adequacy requirement does not comprise any restriction for granting credit and there is thus a large supply of credit. In the same way as an economic slowdown can be reinforced if many banks are simultaneously affected by a higher capital adequacy requirement, a lower capital adequacy requirement can contribute to overheating during a period of strong economic growth.

There are thus elements in the new capital adequacy regulations that could reinforce the prevailing economic phase. However, the strength of these elements should not be exaggerated:

Firstly, the regulations on capital adequacy ratios reinforce the incentives for more healthy risk taking by the banks, which should have an overall effect of increasing stability in the financial system.

A bank with a sound risk assessment and self-preservation instinct would build up an extra capital buffer during times of good economic growth, as the bank knows from experience that credit losses will be greater during a coming economic slowdown.

Secondly, a bank with a sound risk assessment and self-preservation instinct would build up an extra capital buffer during times of good economic growth, as the bank knows from experience that credit losses will be greater during a coming economic slowdown.

Thirdly, the new capital adequacy regulations also provide some opportunities to deal with the above-mentioned procyclicality problems, primarily through the qualitative supervisory process that comprises the second pillar in the proposal. The supervisory authorities are hereby expected to evaluate the banks' capital requirements in relation to their risks, and if necessary to intervene. The Basel Committee proposal also gives the supervisory authority the opportunity to raise the capital adequacy requirement for an individual bank. This opportunity could be used, for instance, to adapt the capital adequacy requirements with regard to individual banks' sensitivity to economic developments. However, it should be pointed out that

such use of the second pillar has not yet been analysed and if it were used in this way, other issues might arise.

An additional means of alleviating the problems could be to adapt the reporting regulations for banks, so that the cyclical effect on the banks' results is reduced. The next section discusses a method that could be used for this – dynamic provisioning.

DYNAMIC PROVISIONING

The idea of dynamic provisioning is based on the principle that both income and expenditure should be reported as they arise. In addition to its current expenditure, the bank takes into account two factors when pricing a loan. Firstly, the bank wants to be paid for the *expected loss*, i.e. what it knows from experience that it loses on average on this particular type of loan. To compensate itself for the expected loss, the bank includes an "insurance premium" in the lending rate it charges. Secondly, the bank wants to be paid for the risk that the loss may be even greater than expected. The price of the loan therefore also contains a "risk premium".

Both the insurance premium and the risk premium are thus components in the interest income generated by the loan which is booked in the bank's profit and loss account during the duration of the loan. On the other hand, the costs connected with the two premium incomes are reported in different ways. The bank is obliged to allocate capital for unexpected losses, i.e. in principle corresponding to the risk premium, as soon as the risk arises. However, it does not need to allocate any reserve corresponding to the insurance premium until the cost has actually materialised.[37] It is because the materialisation – in the form of bankruptcies and difficulties in meeting payments of this latent cost – tends to follow a strong cyclical trend that credit losses and thus the banks' results covary strongly with the economic cycle.

Assuming that the bank has allocated the premium income generated during periods of good economic growth, the cyclicality of a bank's profitability should not comprise a problem. In this case the capital, which then consists of both insurance premiums and risk premiums, will grow during times of good economic conditions and decline during less favourable periods when it is used as a buffer – the bank's capital will in this case show cyclical variation. However, there is a risk that the insurance premium income from prosperous periods has not been deposited, but instead transferred to shareholders in the form of dividends or buy-backs.[38]

One possible solution would be to allow the bank to make a provision equivalent to the insurance premium applied when pricing the loan as soon as the loan is issued.

37 According to the current practice, the bank makes a reserve when the loss has been established or is judged on reliable grounds to be very probable.

38 There are a number of possible explanations for this. These include *moral hazard* (the banks are counting on receiving support from the authorities in the event of a crisis), shortcomings in the banks' *corporate governance* (the bank management's thinking is short-term, concentrating on current profitability with an eye to bonus programmes, golden parachutes, etc. rather than seeing the result in a longer-term perspective), effects of certain *signalling behaviour* (the bank chooses not to report problems in the credit stock until it is less "harmful" to do so, which is when other banks are also experiencing problems).

If the banks have not set aside capital corresponding to the insurance premium income, this means that they will be forced to use the capital originally set aside for unexpected losses to cover credit losses that were expected, in a statistical sense. This means that the earlier discussed problems arise with regard to meeting the capital adequacy requirements.

One possible solution would be to allow the bank to make a provision equivalent to the insurance premium applied when pricing the loan as soon as the loan is issued. This type of *dynamic reserve* would enable the bank to bear the cost connected with the premium when it arises instead of when it might materialise.[39]

Spain is one of a small number of countries that has recently begun to apply dynamic provisioning in practice. Spanish banks have been obliged for one year now to take into account the latent bankruptcy cost in their loan portfolio when allocating reserves. This part of the credit risk is covered by what is known as a *statistical reserve*. The individual bank's own credit loss history in different loan segments is used to estimate the average level of credit loss over time in the respective loan segment.[40] The statistical reserve can then be calculated on the basis of these estimates and the current composition of the loan portfolio. If (probably during an economic boom) the statistical reserve exceeds the reserve made for ascertained and likely losses, the difference is allocated to a special fund, the "statistical" fund. If the opposite case applies (probably during an economic recession), the bank can utilise the fund to a corresponding degree to reduce the credit loss reserve in its results. The consequence of this will be that Spanish banks, all else being equal, will report a more even development in credit losses and profits over time than other banks.

Dynamic provisioning is thus an accounting method enabling the banks to periodise the latent cost in their loan portfolios. This affects the results reported by the banks and thus also their opportunities to pay out dividends to shareholders. In Spain there are two main motives behind the new system.

The latent credit cost is made clear from the outset, which brings a more forward-looking dimension to the traditionally more reactive system.

For one thing, it makes the latent credit cost clear right from the start, which adds a more forward-looking dimension to the traditionally more reactive system. This information can be important for both the bank's own management and for external analysts assessing the future development of the bank. *For another thing*, it reduces the cyclicality in the banks' results, which should reduce the risk of more banks being affected by problems at the same time.

Another important aspect of dynamic provisioning is how it should be treated in terms of taxation. If the dynamic reserve were not

39 The reserves are "dynamic" in the sense that they distribute the latent credit cost over the entire duration of the loan, unlike the current "static" reserves not made until the specific point in time when the credit cost materialises.

40 The database must cover at least one entire economic cycle and be approved by a supervisory authority.

taxed, it would provide an incentive for the banks to make reserves for the latent cost in their loan portfolios at the earliest possible stage. The result would be a slightly lower taxable capital in prosperous times and a slightly higher taxable capital in poorer times. The disadvantage of this system is that it could give the bank too many opportunities for manipulating results and tax planning, which is the reason why the tax authorities have generally been critical of dynamic provisioning. However, this potential disadvantage could be reduced considerably *both* by a supervisory authority having to approve the dynamic provisions made for each period, *and* by setting a ceiling for the total statistical fund.

The current method for allocating reserves tends to distort the picture of the banks' actual profitability over time – the result appears to be more cyclical than it actually is.

The current method for allocating reserves tends to distort the picture of the banks' actual profitability over time – the result appears to be more cyclical than it actually is. This can lead to an overestimation of the profits during prosperous times as well as the quality of the credit portfolio, which can in turn lead to a failure to make necessary allocations or to problems being detected unnecessarily late. In the same way, there is a risk during poorer times that the banking sector will be weakened and intensify a weaker economic climate. Under these conditions, dynamic provisioning would have a stabilising effect on the banks' results and capital and thereby also on the finance sector as a whole.

Increased transparency is probably an important complement to clarify the latent cost of the loan portfolio. Better accounting of the loan portfolio's components, as well as the credit risks and market risks attached to these is thus fundamentally desirable. The third pillar in the Basel Committee's proposal for new capital adequacy regulations contains relatively comprehensive requirements for public accounting of the banks' risks, risk assessment and risk management. However, the reporting is based on earlier experiences and not on forecasts for the future. If the information is sufficiently detailed, market analysts and authorities ought to be able to assess the risks in the light of current (e.g. economic) developments nevertheless.

The Riksbank's summarised assessment is that the fundamental principal of the Basel regulations of relating the capital adequacy requirement as far as possible to the underlying risks is sound and contributes to financial stability.

The Riksbank's summarised assessment is that the fundamental principal of the Basel regulations of relating the capital adequacy requirement as far as possible to the underlying risks is sound and contributes to financial stability. However, the proposal for new capital adequacy regulations contains certain mechanisms, which could strengthen the cyclical effects on the banking sector and the procyclical influence that the banking sector in turn risks having on the national economy. It is possible that these problems could be partially dealt with through the framework of the second pillar in the

Basel Committee's proposal, namely the supervisory review process. This ought perhaps to be complemented by allowing dynamic provisioning, i.e. by consolidating certain income from credit granting during prosperous times to cover credit losses during poorer times. Measures to increase transparency in the banks' exposures should be considered in combination with the dynamic provisioning.

Operational incidents in the banking system – two examples

The Swedish banks, in common with society as a whole, are becoming increasingly dependent on computer and communication systems. This means that software problems can have serious consequences not only for individual banks, but also for the payment system as a whole. Minor interruptions in computer systems occur almost daily at the banks. During the past six months, the Riksbank and Nordbanken have also suffered two serious, prolonged disruptions. Below follows a description of the two incidents, followed by a discussion of the consequences for the payment system and the systemic risks that similar incidents could entail.

THE RIKSBANK

In October 2000, the Riksbank's computer system for settlement of large payments between banks, RIX, suffered a serious disruption. A number of euro payments were sent twice, which led to incorrect bookkeeping. The Swedish banks therefore did not know their actual position in SEK at the end of the day and were unable to effectively balance surpluses and deficits between themselves. The fault was not detected until two days later, and was connected with the communication system linking the banks to the RIX system. It took a further three days to correct the fault and test the new solution.

Thanks to a well-established emergency procedure, the payment flows between the banks could continue without any major problem during this period.

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NORDBANKEN

At the turn of the year, Nordbanken suffered disruptions to its computer system on several occasions. The problems, which started with the first computer breakdown in the middle of the post-Christmas retail sales period, were not resolved until three days into the new year. The effects of the disruptions were particularly extensive as the number of transactions is always much higher than normal around the New Year holiday. The fact that the bank's computer system could be made operational part of the time prevented what could otherwise have been a serious situation.

The problems could be traced to software that had been changed during the Christmas week. The situation was made worse by faults in the software for restarting the computer system, which had not

been remedied, despite amendments by the supplier several months earlier. The restart therefore took much longer than usual. The bank then tried to make up for lost time by running three days' worth of transactions in two days. The capacity of the system was inadequate for this and a decision was made on prioritising manually in order to steer resources from other parts of the system. Under these stressful conditions a couple of administrative errors were made by the operators, which made the problems even worse.

CONSEQUENCES FOR THE SWEDISH PAYMENT SYSTEM

These incidents are typical examples of what is usually known as operational incidents[41]. It can be observed afterwards that the Riksbank and Nordbanken escaped relatively unharmed in these cases. Incidents of this kind could in the worst possible case have had consequences not only for the bank concerned and its clients, but could also lead to serious disruptions in the payment system.

If a bank is unable (as in the Nordbanken case) to send off payments itself due to a computer error, while all of its counterparties continue to send money to the problem bank, this will result in liquidity becoming locked into this bank. In other words, the problem bank will have a surplus of liquidity, while other financial players will have a deficit. If the problem bank's computer system is not functioning, it might be the case that the bank cannot make use of the surplus liquidity, which would entail a total cost for the system. This could also cause short term disturbances to the liquidity of other banks.

In the Nordbanken case, the emergency routines in RIX were used, which enabled all transactions to be settled. However, in order for the emergency routines to function, it is necessary that RIX can receive the transaction data from the banks' internal computer systems. Fortunately, in this case Nordbanken's system functioned from time to time and could thus communicate transaction data to RIX. The situation could have been very serious if Nordbanken's system had instead been completely down for several days in a row over the New Year holiday period.

To avoid a contagion of this type of liquidity problem, the first thing the Riksbank can do, as soon as the problem is detected, is to inform the other participants and stop further payments to the problem bank. There is then an opportunity to transfer loans manually from the problem bank to other players. As a final resort, other players could borrow money from the Riksbank in its role as "lender of last resort".

The Nordbanken case also had consequences for the consumer end of the payment system. Bank clients now have the opportunity to carry out their business directly at bank offices if there is a problem with ATMs, telephone banking or Internet banking. However, this assumes that there are offices open, available and having sufficient capacity. Moreover, either the office's computer system must function or it must be possible for the business to be administered manually, directly or by storing transactions. As an increasing number

41 The Basel Committee defines operational risk as "the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events".

of banks are closing down their offices in favour of Internet services, the clients' access to this emergency channel is reduced.

INCREASED DEPENDENCE ON SOFTWARE

Nordbanken's software problem derived from software developed by several different software suppliers, while the Riksbank's software was developed internally. Today's software programs are increasingly complicated and integrated with one another. One problem is that the programs can react differently depending on how they are combined.

Errors in communication and software are often more difficult to detect and remedy than errors in the hardware.

Errors in communication and software are often more difficult to detect and remedy than errors in the hardware. The problem in RIX, for instance, arose only with certain combinations of payments and if there was a queue situation. One potential development is that future software will be able to detect and remedy faults itself. If the trouble-shooting routines in the software are not improved, there is a risk that increasingly complex and integrated computer and communication systems will lead to a greater number of operational incidents.

The incidents at the Riksbank and Nordbanken underline the importance of testing new programs in test environments that are as similar to the normal operating environment as possible and of developing and regularly practising emergency routines.

JOINT SOFTWARE SUPPLIERS

Operational losses differ from market losses and credit losses in that they do not normally affect several banks at the same time. However, apart from virus attacks, joint software errors could achieve this type of contagion among the banks. The Millennium bug, which it was feared would be able to hit several computer systems at the same time, is one example of this, but problems could also arise on a smaller scale. There are not very many international software suppliers, and it is reasonable to assume that the same basic software can be found in more than one bank. Errors can be found even among the products from the most well-reputed software suppliers, which is usually noticed sooner or later and amendments sent out to customers. However, these amendments, combined with all of the updates of the software, comprise a lot of information for the banks. Depending on the strategy of the individual bank and the instructions for program changes, this can lead to prioritising in many cases, which may prove to be a mistake. If several banks' computer systems are affected at the same time, a stability-threatening situation could arise.

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CONCLUSIONS

In order to avoid as far as possible software errors having serious consequences for an individual bank and for the payment system as a whole, it is important that:

- the banks' IT divisions actually follow the internal instructions as to when and how software changes can be implemented;
- the banks maintain good communication with their software suppliers, as well as support agreements that provide rapid support in the event of problems;
- banks developing their own software make sure they test it thoroughly under conditions as close to production conditions as possible;
- the banks have well-defined and rehearsed emergency routines and plans with clear rules for prioritising;
- the banks should warn other banks if they detect a joint software error. It should be noted that a software error that has an effect on one bank need not have the same effect on another bank, due to differences in integration with other computer systems and adjoining software;
- the information flow and co-operation with the authorities involved function in the event of incidents;
- the information flow to the general public functions in the event of incidents.

Increased financial stability through international standards

Financial crises lead to substantial socio-economic costs, as we have been able to observe in recent decades. Standards that provide guidance and specify best practices reduce the risk of financial and macroeconomic crises, provide a frame of reference and methods for evaluating a country, as well as providing guidance for the development of countries that do not yet meet the standards. International organisations push through the development of standards and they also carry out independent assessments of individual countries. The IMF and the World Bank, for instance, have standards that they use as a frame of reference when assessing a country's vulnerability to economic shocks and as conditions when granting credit.

WHICH ARE THE MOST IMPORTANT STANDARDS?

In order to optimise the use of resources, financial organisations representing both industrial nations and developing countries have agreed on a list of twelve prioritised standards. This list contains standards that define the information requirements for monetary policy, financial issues, fiscal policy and statistics, settlement requirements on insolvency and for ownership control, accounting, auditing, payment and settlement systems, as well as market abuse. In addition, there are supervisory requirements for banks, securities companies, securities markets and insurance companies.

The aim has been to select standards that will when combined provide protection against crises. These standards covary to a great

extent. For instance, the supervision of banks and other financial companies is made more difficult if accounting and auditing regulations are not properly formulated.

IMPORTANT STANDARDS FOR FINANCIAL STABILITY

The standards that are most important in connection with the Riksbank's work on stability are the regulations for payment and settlement systems and the regulations for supervision.

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The former state how the payment and settlement system for large payments should be organised and the inherent risks minimised, while the latter establish minimum regulations and best practices for regulation and supervision, as well as stating how the financial institutes and markets themselves should act, for instance, with regard to risk management. As an example of what the standards contain, the standard for bank supervision is described in greater detail below.

The Basel Committee on Banking Supervision has written down twenty-five Core Principles for supervision of banks. These principles cover the various sub-areas that form the basis of good supervision and bank management, such as:

- The supervisory authority should be independent from interference and have the competence and resources necessary for the intended operations.
- All banks and other bank-like credit institutes should be subject to laws, regulations and supervision.
- New banks should only be allowed to start up after a licence has been granted by the authorities. This process should include an assessment of the planned operations and whether the organisation is sound and the owners and management are competent and honest.
- Banks should have adopted policies for capital adequacy, credit granting, loan loss reserves, management of various types of risk (credit risk, market risk, operational risk, liquidity risk, etc.) and for internal control of operations.
- The supervisory authority should exercise supervision both off-site (through reports from the banks) and on-site (through visiting the banks). The supervision should cover the entire banking group, including institutes that are not banks or even financial institutes, i.e. consolidated supervision.
- The banks should follow internationally recognised accounting standards, which should be checked by the appointed auditors.
- The supervisory authority should have a mandate to act rapidly and effectively by implementing measures to prevent problems in banks growing out of proportion.
- When banks establish branches and subsidiaries abroad, the supervision should include these and collaboration should therefore be organised with supervisory authorities in other countries.

As yet there has been no formal evaluation, for instance by the IMF, as to how well Sweden meets the standards on payment and settlement systems and on banking supervision.

WHO DESIGNS THE STANDARDS?

Considerable specialist knowledge is required to design standards, which means, for instance, that accounting experts design the standards for accounting, bank supervisory authorities design the standards for banking supervision, etc. Furthermore, it is important that the standards have widespread international support – this is primarily achieved by ensuring that as many countries as possible are involved in working out the text of a standard. Finally, they require political anchorage and governmental support, with commitments to work to ensure the standards are implemented.

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