

■ Can a bank failure threaten the payment system?

Many participants in the financial markets probably expect that the central government will prevent a major Swedish bank defaulting. This expectation is based on the banks playing such a central role in the payment system that there is a risk the system would cease functioning if a default occurred. This article discusses to what extent the payment system would actually cope with a default. The conclusion is that under certain circumstances it would be possible for a major bank to fail without fundamentally threatening the functioning of the payment system.

The functions of the payment system comprise the essence of what the Riksbank means by financial stability and the Riksbank's explicit objective is to promote the system's safety and efficiency. The banks are the central participants in the payment system and the failure of one bank could, under certain circumstances, cause the system to cease functioning, which would have very negative effects on the economy as a whole. The banks are also central to other functions performed by the financial system, such as capital supply and risk management. The importance to society of the functions performed by the banks, particularly in the payment system, combined with the special systemic risks in the banking system, create a need for society to apply special regulations and supervision to the banks. This is also why the Riksbank is entitled to provide emergency liquidity assistance to banks suffering problems and why the Riksdag may feel obliged to support banks financially, as was the case during the bank crisis in the early 1990s. The significance of the banking system and the previous government actions, combined with the fact that the Swedish banking system is very concentrated to the four major banks, has probably contributed to a broad impression in society that these banks cannot be allowed to fail, at least not in an uncontrolled manner. In other words, there is an expectation that the central government will in some way support these banks if they risk defaulting.

This assumption of the major banks' systemic importance has never been investigated in detail, but is based on their evident size in relation to the payment system. The assumption risks leading to the banks and their financiers counting on the central government feeling obliged to intervene in some way to save the banks if they face financial problems. This in turn can lead to a higher level of risk-taking and to incorrect pricing of the risks in the banking system (known as moral hazard), a cost that society would ultimately have to bear.⁵⁷

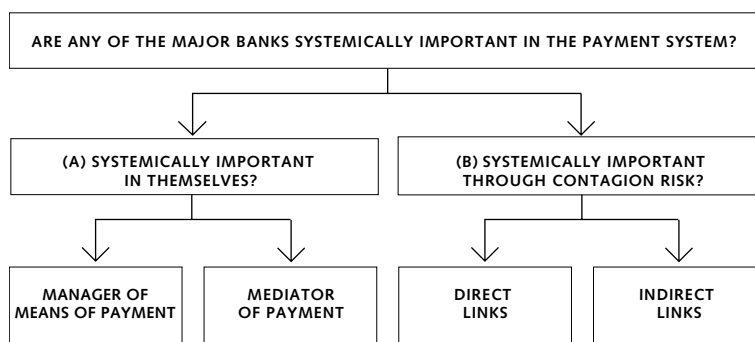
This article asks the question of whether, and if so, how, the major Swedish banks are individually of systemic importance to the payment system, as well as discussing how the Riksbank and other authorities can work to reduce their possible systemic importance.

For a bank to be systemically important to the functioning of the payment system, either (A) the bank itself must be necessary for the

⁵⁷ This conclusion was reached by the Banking Law Committee in the report that forms a basis for the bill regarding new banking legislation currently being drafted by the Ministry of Finance, "Regulation and supervision of banks and credit market companies" (SOU 1998:160).

functioning of the payment system or (B) problems within this bank must be able to spread to the other banks and thereby risk putting the payment system out of function. This article analyses these two conditions for systemic importance in the Swedish payment system.

METHOD OF ANALYSIS



An important restriction in this analysis is that it is initially only one bank that is affected by problems, not the banking sector as a whole. Examples of this type of situation are the falls of Baring Brothers in 1995 and Bankhaus Herstatt in 1974. These banks failed due to losses caused internally; not to events affecting many banks at the same time. In the Herstatt case the problems spread to other banks through their exposures to Herstatt. The Swedish banks have to a large degree similar exposures and operations. This leads to the banks facing difficulties at the same time, which was the case in the bank crisis in Sweden at the beginning of the 1990s. Such situations are only indirectly covered by this analysis.

Another restriction in the analysis is that it is only the banks' systemic importance in the payment system that has been studied. In addition to being central participants in the payment system, the banks also comprise the core of the capital supply, that is to say, the banks contribute by financing companies' and households' investments and may be worth protecting for this reason as well. This requires closer study, but it is very doubtful that the banks would be systemically important from a capital supply point of view if one bank suffered problems initially. The reason is that capital supply is not as dependent on timeliness as the mediation of payments. Firstly, it is only the failing bank's new lending that would cease, as the outstanding loan stock would not immediately be called in if the bank failed. Secondly, other banks have some capacity to increase their credit granting even at short notice. In the long term, the other banks also have the opportunity to increase their capital for granting further credit. There are also other sources of capital than the banks. A well-developed bond and certificate market reduces the vulnerability of the economy to credit supply effects from a bank failure. The capital supply is thus less dependent on the banks than the mediation of payments, which further reduces vulnerability. The risk of a general credit crunch in the economy is thus lower when one bank initially faces problems than when the entire banking system simultaneously suffers unmanageably large loan losses.

Important participants in the payment system

In principle, the banks fulfil two functions in the payment system; they intermediate payments between various economic agents and they manage the means of payment on behalf of customers for future payment transactions. It is possible that a bank has systemic importance through its own significance in the payment system, even if it would not bring down other banks if it fell. When one bank fails, the bank's customers will not have access to the means of payment in their accounts with the bank and will thus be unable to use them for transactions. In addition, these customers will be unable – or unwilling – to receive payments into their accounts with the bank. If they cannot receive or make payments in some other way, they will be excluded from the economy. If this applies to many participants and to large sums of money, it can have considerable financial consequences for society.

An individual bank can thus be systemically important if it either manages considerable sums of means of payment or if it mediates a large share of the payments within the economy and is difficult to replace.

IS ANY INDIVIDUAL BANK SYSTEMICALLY IMPORTANT AS MANAGER OF MEANS OF PAYMENT?

Means of payment are funds intended for payments within the relatively near future and which have therefore been invested in such a way that they are available at a low cost and at short notice. The common means of payment for households and companies are banknotes and coins, assets in various forms of transaction accounts, credit through credit cards and charge cards and overdraft facilities.

Assets in savings accounts with withdrawal charges and securities that can normally be converted to cash at a low cost and with a relatively predictable value, can be regarded as means of payment reserves to be utilised for larger transactions. These reserves can possibly be also used in cases where the ordinary means of payment are inaccessible. In this article these assets are referred to as potential means of payment.

When a bank fails, it usually cancels all of its payments. Means of payment on account are then usually frozen until final settlement of the liabilities and assets. Deposits of up to SEK 250,000 per customer are protected by the Deposit Guarantee Board (IGN). Bank customers risk losing funds above this amount. IGN is unable to pay out any compensation until the bank has been declared bankrupt. However, bankruptcy would probably occur shortly after the payment default. If the bank opposes a bankruptcy declaration, for instance, by claiming that it is solvent and merely lacks liquidity, the bankruptcy proceedings could in theory become prolonged. A bank would be unable to oppose a bankruptcy for many days, as its capacity to retain customers and implement transactions would cease as soon as it began to default on payments. IGN is obliged to pay compensation no later than three months after bankruptcy is declared, but the aim is to pay within a few days.

Securities in custody with the bank will also initially be covered by the freeze. The owners of these securities do not risk losing their holdings, but may not have access to them for a period while their ownership is established. Customers who have the bank as their depository agent with VPC and customers of securities companies that have used the bank as settlement agent will not have access to their assets in securities accounts either. Access will not be possible until they receive a new depository agent or, in the latter case, their securities company has arranged a new settlement agent or they themselves change bank.

The Swedish general public, i.e. households and non-financial companies, had SEK 604 billion in actual means of payment deposited with the four major Swedish banks on 31 December 2002, which is shown in Table A. Overdraft facilities are included in the definition of means of payment. The major banks' percentage of the general public's actual means of payment on account with Swedish banks and securities companies is almost 80 per cent.⁵⁸

Table A: Liability items for the four major banks (SEK billion, Q2, 2002)

	Four major	Other	Total
Deposits and lending	1 760	393	2 153
Counterparties in Sweden	947	260	1207
Swedish MFIs	236	45	281
Non-financial companies	329	74	403
<i>Transaction accounts^a</i>	264	34	298
Households, etc.	382	142	524
<i>Transaction accounts^a</i>	133	72	205
Unutilised overdraft facilities ^b	207	57 ^c	264
Actual means of payment^d	604	163	767
Percentage of the sector's actual means of payment	79%	21%	100%
Guaranteed by IGN	336	55^e	391

a) Incl. overnight loans.

b) Figures for the entire group, however in Nordea's case the group figure is divided by 4. The figures also include financial and public sectors.

c) Estimate, same proportion as other deposits and lending.

d) Means of payment = non-financial companies' transaction accounts + other households' transaction accounts + unutilised overdraft facilities. These are the most liquid forms of account, which are probably intended for making payments in the near future. Other accounts may also be covered by IGN.

e) 31 December 2001.

Sources: The Riksbank, IGN and annual reports.

The SEK 604 billion corresponds to just over 6 per cent (604/(3299+6104+264)) of the general public's total financial assets, or around 21 per cent (604/(1836+985)) of their means of payment (actual and potential), which is shown in Table B.

Handelsbanken (SHB) is the bank which reports its deposits and borrowing in most detail in its reports. The analysis below therefore uses figures from SHB. The Riksbank has made a corresponding analysis for all

⁵⁸ Financial institutions' means of payment deposited with one another will be analysed under a later heading, together with interbank exposures, as a contagion risk.

Table B: Households' and non-financial companies' financial assets (SEK billion, Q4, 2002)

HOUSEHOLDS			NON-FINANCIAL COMPANIES		
Financial assets	3 299	100%	Financial assets	6 104	100%
Banknotes, coins, deposits	631	19%	Banknotes, coins, deposits	419	7%
<i>Banknotes and coins</i>	77	2%	Certificates	159	2%
<i>Bank deposits</i>	537	16%	Loans, bonds, subordinated debentures	143	2%
Loans, bonds, subordinated debentures	111	3%	Financial derivatives	48	1%
<i>Financial companies</i>	39	1%	Group loans	1 354	22%
Shares, stocks, mutual funds	1 095	33%	Unlisted Swedish shares	1 273	23%
Insurance policy savings	1 444	44%	Other shares and mutual funds	1 287	22%
Other	19	1%	Other	1 421	20%
			Unutilised overdraft facilities^b	264	-
Actual and potential means of payment^a	1 836		Actual and potential means of payment^c	985	

a) All items excl. insurance savings and other.

b) Estimates, 31 December 2002, including financial and public sectors' unutilised overdraft facilities.

c) Banknotes, coins, deposits, certificates, loans, bonds and subordinated debentures, unutilised overdraft facilities.

Sources: Statistics Sweden's Financial Accounts Q4, 2002, the banks' annual reports.

of the banks, using confidential data. All four banks have a similar size in their deposits and borrowing from the general public and the conclusion of the analysis, based on SHB's official data, can also be applied to the other banks. SHB manages SEK 220 billion in actual means of payment⁵⁹ corresponding to approximately 8 per cent ($220/(1836+985)$) of the general public's means of payment. Taking into account the fact that there are also potential means of payment in accounts at SHB amounting to a value of approximately SEK 74 billion, around 10 per cent ($(220+74)/(1836+985)$) of the general public's means of payment risks being locked in if SHB should fail.

The means of payment that risk being lost, which can be regarded as being permanently locked in, are those not covered by the deposit guarantee. At the year-end 2002, IGN guaranteed SEK 75 billion of the total of SEK 220 billion actual means of payment (Q2, 2002) in SHB. The non-guaranteed actual means of payment thus amounted to at least SEK 145 billion at the year-end 2002.⁶⁰ This corresponds to approximately 5 per cent ($145/(1836+985)$) of the general public's means of payment. If account is also taken of potential means of payment in accounts at SHB, the total percentage of non-guaranteed means of payment is approximately 8 per cent.

The potential means of payment that to some extent depend on the functioning of the banks for conversion to actual means of payment, but are not owned by the banks, should be added to the lock-in effect. These include the mutual funds managed by the banks, securities in custody with banks or in securities accounts for which the bank is depository agent, as well as securities accounts with the companies for which the bank acts as settlement agent. Large totals of this form of asset risk being locked in if any of the major banks should fail.⁶¹ However, they do

⁵⁹ Means of payment here refers to: deposits in Swedish kronor from the general public, payable on demand (assumed to be the same proportion as deposits in total) plus unutilised parts of overdraft facilities.

⁶⁰ Other accounts than current accounts are covered by the deposit guarantee, as are deposits from financial companies.

not risk being lost, although it can take some time before they are available to be converted to actual means of payment. Bearing in mind that it can be a question of hundreds of thousands of customers who need to change their depository agent, there is a risk that it will take some time to implement such a change. In addition, VPC lacks routines for managing changes of depository agent in connection with a bank failure. Presumably the largest customers will be able to find a new depository agent relatively quickly and easily. The number of customers who will need a new settlement agent (i.e. certain securities companies) is limited, which indicates that they should immediately gain access to a new one. The securities not held in custodies with the failed institution could presumably be used within the course of a day or so with regard to the largest customers and a few days with regard to smaller customers. The time before the general public, particularly large and medium-sized companies, once again gains access to custodies is critical in this context. If it turns out that it is a question of a few weeks, rather than a day or two, there is a greater risk of serious disruptions to the economy. Finally, it should be mentioned that converting these assets into means of payment usually requires an account with a bank that has not failed, as discussed below.

Thanks to the fact that companies and households often have the opportunity to postpone their payments, the lock-in effects may be mitigated. As a rule, both companies and households can wait a few weeks to pay their bills and invoices without major financial consequences. Otherwise, those affected and society as a whole tend to show a certain amount of pragmatism in such situations, as demonstrated during the bank strike in 1990. Companies that are not affected by the problem should be able to pay small advances on wages to employees affected (i.e. those with a different bank from the company) and creditors should show some understanding for some delay in payments. Many people would have the possibility of borrowing small amounts from family and friends to manage necessary expenditures. In addition, many would have the opportunity to implement minor transactions by credit cards issued by other companies than the failed bank. Other banks would probably make an effort to attract as many of the failed bank's customers as possible. All in all, most of those affected should have the opportunity to obtain a respite to convert less liquid assets into means of payment or to await compensation from the Deposit Guarantee Board. Certain people and small companies, particularly those with only one bank or those dependent on overdraft facilities, would risk being hard hit and experience considerable problems themselves, although the consequences to society as a whole should not be so great.

The conclusion is that the lock-in effect from one of the four major banks defaulting would probably not in itself be on a scale to threaten the payment system. Given that these four banks entirely dominate the

61 A survey of the banks' annual reports over the past years leads to the conclusion that the amounts in custodies with the major banks owned by the Swedish general public amount to an estimated SEK 400 billion to SEK 1,000 billion per bank. The number of custodies is 100,000 and upwards per bank. What is important is not the exact sums or figures, but the conclusion that large amounts of money are involved and a large number of customers.

deposit market, one can also conclude that no other financial institution can be systemically important for this function. However, the central government should consider how this lock-in period could be reduced. Does IGN have the administrative capacity to pay out compensation within a reasonable time to a large number of depositors? Can VPC manage to meet a situation where many securities accounts lack depository agents and securities companies lack settlement agents? How do the banks manage custody accounts and customers' mutual funds in connection with a default?

IS ANY INDIVIDUAL BANK SYSTEMICALLY IMPORTANT AS INTERMEDIATOR OF PAYMENTS?

In addition to being managers of means of payment, the banks are also intermediators of payments. Customers have the opportunity to send and receive payments via their bank accounts. Without an institution to intermediate payments, for instance, in the case of all banks failing, the economy would be forced to rely on cash transactions, which would entail serious efficiency losses and thereby higher costs.

If a bank defaults, its customers become cut off from the payment system for a short or long period until they can arrange for another bank to intermediate their payments. Apart from the evident problems that arise for the customers who cannot implement account-based payments, customers whose means of payment become locked in may also have problems converting assets such as shares and mutual funds into means of payment if they lack an account to receive the liquidity.

The cost to society of a number of companies and households lacking an intermediary of payments would depend on how many were affected and how long it took them to replace their intermediary.

To obtain a picture of how dominant the major banks are as intermediators of payments for the general public, one can look at their percentage of the payment flows through Bankgirocentralen (BGC). The four major banks together have over 90 per cent of these payment flows and are thus entirely dominant as intermediators of payments between accounts. Each of the major banks accounts for between one-sixth and one-third of these flows. The banks' respective percentage of the transaction accounts can also be estimated with the aid of the banks' share of the bank card market. As shown in Table C, the four major banks together had 97 per cent of the number of outstanding bank cards in 2000 and 98 per cent of the transaction value. Looking at the number of bank cards, one of the banks has a much larger percentage of those outstand-

Table C: Bank cards per bank (year 2000)

	Bank card per bank			
	Number of cards (thousand)	share	Transaction value (SEK billion)	share
Four major banks	4 449	97%	140	98%
Others	121	3%	3	2%
Total	4 570	100%	143	10%

Source: The Riksbank.

ing than the other banks, while the banks are slightly more equal with regard to the size of the transaction value. Judging by these figures, one of the banks dominates the market for transaction accounts for households (although company cards are also included in the statistics, most companies probably use some form of charge card or credit card rather than a bank card if they make card payments).

The major banks are also involved in mediation of payments in other ways than transfers from their accounts. The most important is probably BGC, which is owned jointly by the banks. According to the Riksbank's assessments, BGC's system is constructed to administratively manage the failure of a large participant.

Probably the most important part of the infrastructure for payments that is an associated company to the major banks and thus at risk of being brought down if the parent company should fail, is Babs. Babs is 49 per cent owned by Förenings-sparbanken and manages the authorisation, transport and exchange of just over 50 per cent of all card transactions. As there are alternative systems and substitutes to card payments, the possible failure of Babs would not comprise a threat to the payment system.

Most of the large and medium-sized companies probably have contacts with several banks, which means that those who do not already have transaction accounts with more than one bank could immediately arrange this. Nor would changing the intermediary of payments take too long for the other customers. However, the large number that would be trying to change bank at the same time could give rise to some delays. What could further complicate a change is that companies are to varying degrees locked in to the failing bank, for instance, through administrative routines, established account numbers and overdraft facilities. Although, it is possible to keep a bank giro number when changing bank.

The fact that a large part of all households would for some days lack the opportunity to make and receive payments to and from their own accounts need not constitute a serious threat to the economy, despite the fact that the payment system could not in this situation be said to function satisfactorily. Although many households would then be cut off from their own accounts, they would not be completely cut off from the payment system. They would still have the possibility to receive payment notifications which could be cashed at bank branches and would have the opportunity to make payments in the same way. This is, of course, very impractical and not appropriate with regard to large sums. As concluded for the lock-in effect, however, it is often possible for the general public to postpone certain payments for some time while they arrange an account with another bank.

The conclusion is that none of the four major banks can be regarded as systemically important in its role as intermediary of payments. As the mediation of payments in Sweden is entirely dominated by these four banks; no other financial institution, with the exception of the clearing and settlement organisations, can be considered systemically important to the mediation of payments.

Contagion risks

As there are direct and indirect connections between banks in a system, the failure of an individual bank risks leading to other banks experiencing difficulties and, in a worst case scenario, also failing. In a situation where several banks fail, the functioning of the payment system may be seriously damaged, even if they are not individually systemically important.

Direct links between banks participating in the same systems arise through the mediation of payments. If one of the banks is unable to implement its transactions in the payment system due to financial problems, other payment-mediating banks could suffer acute liquidity problems. Direct links between the banks can also arise as a result of other activities. These include pure credit risks, counterparty exposures in derivative contracts and settlement exposures in connection with foreign exchange and securities trading.

The indirect connections appear to work through three mechanisms. Firstly, outside financiers know that direct links may exist between the banks. Secondly, the financiers interpret problems in one bank as a sign of problems in other banks too, as the banks have similar business operations. As a result of these two perceptions, other banks than that originally affected may suffer confidence problems, which can in turn lead to financing difficulties and liquidity problems. Thirdly, other banks risk being affected in a second stage as a result of liquidity and credit problems when customers' means of payment are locked in at a defaulting bank or when economic agents do not receive payment according to plan due to disturbances in the payment system.

DIRECT CONTAGION RISKS

Imbalances in the payment system, exposures directly attributable to the banks' role as intermediary of payments

The hub of the Swedish payment system is the RIX system operated by the Riksbank. The participants in the RIX system are, in addition to the Riksbank, the major banks, the Swedish National Debt Office and a handful of other companies. The system is used for large-value payments between participants. Settlement in this system is based on the principle of real-time gross settlement, which means that payments are settled immediately, one by one, on condition that the sending bank has sufficient liquidity in its account with the Riksbank. These accounts are debited and credited as the payment orders flow in to RIX. In the case of a deficit arising on an account during the day, it is covered by the banks borrowing intraday from the Riksbank. These loans are interest-free, but must be covered by securities pledged to the Riksbank. When the bank covers its liquidity deficit by borrowing from the Riksbank, no credit or liquidity risk arises among other banks. The banks can also borrow from one another intraday, even if this does not occur in principle between Swedish banks. In these cases the credit-granting bank naturally bears the credit risk.

The banks implement payments in RIX both on their own account and on behalf of customers. A rough estimate shows that around half of the, on average, approximately SEK 450 billion a day that passes through RIX comprises payments on behalf of customers. Payments on the banks' own account are dealt with under the next heading.

It is when the bank makes payments on behalf of customers that it is actively playing the role of payment intermediary. Gross transfers in RIX are in many cases amounts that have been netted in other underlying clearing systems, such as BGC, VPC and Stockholmsbörsen. Approximately 6 per cent of the flow through RIX is comprised of these payments.

In those cases where the bank acts as intermediary of payments for customers, no credit risk arises for the bank. When the bank is to receive money on behalf of a customer, it is the customer who bears the credit risk and not the bank. The direct liquidity risk also lies mainly with the customer, as the customer's account is not credited the amount until the bank has received it from the sender's bank. However, the bank can utilise the inflow of liquidity to make its own payments, as the customers do not usually use them directly. The inflows from the defaulting bank would therefore be included in the recipient bank's calculations of liquidity requirement and when these fail to arrive, there is a risk of a liquidity deficit arising. As it is difficult for the banks to know how the payment flows will look, their liquidity planning contains a significant safety margin, although of course this may not necessarily be adapted to include the failure of a major bank. As the participants in RIX together intermediate approximately SEK 225 billion a day on behalf of customers and the major banks account for the major part of this, the lack of flows from one bank could nevertheless be difficult for the other banks to manage. Purely theoretically, the flows between the major banks should cancel out one another – one bank's outflows must correspond to inflows sooner or later – but the flows differ in size from day to day and it is possible that the outflows go via one bank and the inflows via another.

One factor contributing to reducing the effects of inflows that fail to appear is that the recipient bank would respond to the failure of the sender bank by stopping the transfer of payments to that bank. In addition, a number of customers in the recipient bank would not have the necessary coverage in their accounts to make payments, as a result of not receiving any transfers. The customer payments that will not be implemented were also included in the recipient bank's liquidity calculations as an outflow, which thus further reduces the effect of the inflow that failed to arrive.

All in all, there appears to be a need to gain greater knowledge of the payment flows in RIX to be able to draw any clear conclusions regarding if, when and how often payment mediation risks causing liquidity imbalances in the event of a bank defaulting. The most important question needing to be answered is how large are the imbalances that risk arising between the various participants on one and the same day? However, a general conclusion is that the problems could be very widespread, depending on the size of the net flows on the day the default

occurs. If and when problems materialise, they will be expressed in the form of liquidity deficits and not as direct solvency problems.

Counterparty and settlement exposures, exposures not directly attributable to the role of the banks as payment intermediators

Another direct link between the banks is the counterparty and settlement exposures that are not directly attributable to the banks' role as intermediators of payments. Since June 1999, the Riksbank has collected quarterly information from the four major banks on counterparty and settlement exposures. This covers derivative exposures, holdings of securities issued by private issuers, deposits and settlement exposures in foreign exchange trading, i.e. the exposures that lack collateral.⁶²

The statistics show that the risks of direct contagion effects vary, depending on where the problems have originated. There is a risk of contagion between the four major banks in the form of solvency problems, although this risk must be regarded as relatively slight. It is only in a few of the reported exposures that a default by one bank would lead to losses that reduced the exposed bank's Tier 1 capital ratio to below four per cent, if the final loan loss was assumed to be 75 per cent of the exposure. No observation leads to negative capital, not even if recovery is assumed to be zero per cent. Direct exposures to other Swedish financial institutions are much lower than the exposures between the major banks. Failure of one of the other financial institutions is therefore unlikely to lead to solvency problems among the major banks. However, it should be observed that the statistics to which the Riksbank has access are from the end of the quarter. Exposures between the quarter ends are probably greater.

The Riksbank has also made an attempt to study the liquidity effect by studying how the counterparty exposure between banks related to the banks' liquidity scope in RIX on 30 September 2001. The assumption was that if a bank loses its counterparty and settlement exposures to one of the other banks, it will at least be able to utilise the unutilised capacity for borrowing it has remaining in RIX. This resulted in twelve exposures (each respective bank's exposures to each of the other banks). Four of these exposures would have led to losses exceeding the bank's remaining liquidity scope in RIX. One of these exposures was of a size that would probably have entailed substantial liquidity problems for the bank affected. In practice, the banks have the opportunity to create further liquidity than is offered at a particular point in time in RIX. If the banks, for instance, have securities that are not pledged to the Riksbank, they can quickly register them as pledges with the Riksbank. In addition, they usually have back-up facilities for liquidity with other banks. However, the accessibility of these in a crisis situation is uncertain. There is also a possibility that indirect contagion risks will also materialise (see below), which puts further pressure on a bank's liquidity.

⁶² These statistics are analysed and presented regularly in the Riksbank's "Financial Stability Report". See also Blåvarg & Nimander, Sveriges Riksbank Economic Review, 2002:2.

In the near future, a significant part of the foreign exchange exposures, which are often the largest exposures between the banks, will decline considerably when the Swedish banks join the payment-versus-payment settlement in CLS bank.⁶³

VPC (Newclear) and Stockholmsbörsen

The banks also have direct exposures to one another via clearing in VPC (the analysis below is of VPC's new system, Newclear, which is planned to come into operation in November 2003).

VPC manages the transfer of securities from the seller's account to the buyer's account in connection with securities transactions, while the financial settlement is through the RIX system. Payment and delivery are made in accordance with the DvP (delivery-versus-payment) principle, on a gross settlement basis on the settlement day. The DvP system reduces credit risk between the participants. The only remaining credit risk is the replacement cost risk. If one of the four major banks fails, the credit risk through securities trading would be limited.

Newclear enables VPC to check on the settlement date that the seller has the securities sold in its account and that the buyer has the necessary liquidity. VPC then locks these positions pending settlement. This means that there is no risk of unwinding after the transaction has been marked as complete. If one of the banks should default, these transactions that have been marked as complete would be implemented, while other transactions would be eliminated.

Elimination of transactions risks giving rise to liquidity problems in the event of a failure. The other banks and their customers who have sold securities to the defaulting bank, to one of its customers or to the customers' customers⁶⁴ will not receive the inflow of liquidity they had expected. These may in turn face problems in making the payments where they intended to use this liquidity. An imbalance in liquidity risks spreading through the economy, i.e. certain participants will have more liquidity than they wish to have, others will have less. On individual days the net exposures between the banks can amount to more than ten billion kronor. Eliminating this liquidity risk would require a system where trading, clearing and settlement took place simultaneously.

However, there are at least two factors that mitigate liquidity problems considerably. Most of the turnover at VPC comprises securities that the banks can pledge with the Riksbank. The banks can thus convert the securities that were not sold into means of payment. This only applies to participants in RIX. However, other large players should have an opportunity to use repos to obtain liquidity through these securities. The other factor is that transactions where the defaulting bank was seller will also be eliminated. These incomplete transactions to some extent cancel out those where the bank was buyer. In a situation where a bank is facing

⁶³ For further information on CLS bank, see the Financial Stability Report 2001:2.

⁶⁴ The banks are depository agents, which means that they make registrations in the VPC system on behalf of others and they also act as settlement agents for securities companies. If a default occurs, it is not certain that the bank would be able to continue this work, which would prevent its customers from making transactions until they had arranged for a new depository agent and new settlement agent. This could lead to disruptions in the market.

failure, it is probable that it will make net sales of securities in an attempt to create liquidity, i.e. other market participants will supply the bank with liquidity and they could find themselves with a surplus of liquidity.

The assessment is that the banks only bear limited direct credit and liquidity risks if one of the other banks fails. On the other hand, securities trading risks giving rise to indirect effects, i.e. other market participants than the banks will suffer liquidity problems and this will in the second stage affect the banks. It is very probable that there will be a momentary effect on the functioning of securities trading.

Stockholmsbörsen is responsible for clearing standardised derivative contracts. After clearing, any exchanges of securities take place in the VPC system while final financial settlement is made through the RIX system. Stockholmsbörsen is a central counterparty (CCP), which means that it guarantees the implementation of the transactions.⁶⁵ The assessments made by the Riksbank indicate that Stockholmsbörsen would be able to manage the failure of one of the major banks.

Conclusion regarding direct contagion risks

As solvency problems, direct contagion risks are limited, but not negligible. Liquidity risk is less clear and probably varies from day to day, as a result of the constant changes in payment flows and counterparty and settlement exposures. However, some days the liquidity risk is probably of such magnitude that it could be difficult for individual banks to manage if it should materialise. In cases where liquidity problems arise, the Riksbank has the opportunity to reduce the problems in the banks affected by another bank's failure by granting emergency liquidity assistance to these alone. Contagion of solvency and liquidity problems from other financial institutions than the four major banks is unlikely.

INDIRECT CONTAGION RISKS

The three mechanisms behind the indirect contagion risks; that financiers know direct exposures exist, that financiers see problems in one bank as a sign of possible problems in other banks because of similar exposures and that the economy is exposed to a liquidity and loan loss shock, are largely a consequence of the other systemic risks.

It was demonstrated above that there can sometimes be direct links between the banks which result in threats to other banks' solvency or liquidity in the event of an individual bank defaulting. This means that financiers, unless they have information to the contrary, will probably act as though these direct contagion risks threaten the other banks. This will make it difficult for the remaining banks to take in new financing and liquidity and there is a risk of an outflow of liquidity. As the direct contagion risks from other financial institutions than the four major banks are limited, the default of one of these would not need to cause an indirect spread if the external financiers knew of this situation.

⁶⁵ For more information on risk reduction via central counterparty clearing, see the Financial Stability Report 2002:2.

Financiers have little knowledge of the banks' counterparties. If the problems in the defaulting bank are triggered by loan losses, financiers may very well suspect that one or more of the other banks has similar exposures. Therefore, even if they believe that the bank will be able to manage the direct losses from the defaulting bank, there is also a risk that this bank is exposed to the same risks as the first bank.

In this situation, the external financiers' perception of the reason why the first bank failed is an important factor in determining how strong the contagion effect will be. If they perceive that the bank has failed as a result of events specific to that bank, there is little risk that contagion will occur because they suspect the other banks have similar problems. On the other hand, if the failure is due to extensive loan losses, for instance the default of one or more counterparties to the bank, in a particularly problematic industry towards which other banks are also exposed, the situation is more critical. There is then a risk that the combination of the failure of bank and counterparty will bring down other banks. The financiers' concern is then well-founded. In this situation it is largely a question of a correlation between the banks that is reinforced by the contagion effects. As the banks in this case have been affected by the same problem at the same time, it is a situation that falls outside the restrictions for this analysis, as discussed at the beginning of the article.

Liquidity and credit problems can spread through the economy to a large number of households and companies which will not receive the payments they have counted on. These can in turn experience problems in meeting their obligations. Even the banks risk being affected somewhere in this chain as their borrowers may experience problems in paying interest and loan instalments or in meeting other obligations. In addition, companies may utilise credit lines with the remaining banks to meet any liquidity problems they might be experiencing.

However, we have seen that both the lock-in effect and the payment mediation effect appear to be relatively limited and should not provide any major indirect effects threatening to result in systemically-damaging loan losses or liquidity shocks. The indirect effects instead risk arising through securities trading. As discussed in the section on direct contagion risks, the banks will probably be able to manage the direct contagion risks to a great extent through securities trading. Those customers who do not have the opportunity to pledge unsold securities with the Riksbank may find the liquidity problem more difficult to manage. It is difficult to say how much of these disruptions can be absorbed by the companies and households affected and how much will spill over to the banks, for instance, in the form of an increased demand for liquidity and delayed payments, without making a more in-depth analysis.

All in all, the indirect contagion risks constitute a clear danger to system stability, particularly when there is uncertainty over the background to the initial failure and the direct exposures between the banks. It is therefore important, in order to reduce this risk, to clearly communicate the cause of the failure. In addition, the indirect contagion is mainly expressed in the form of liquidity problems, which gives the Riksbank good possibilities both to reduce the risk of these and to mitigate them

when they arise, through its ability to provide emergency liquidity assistance to the remaining banks.

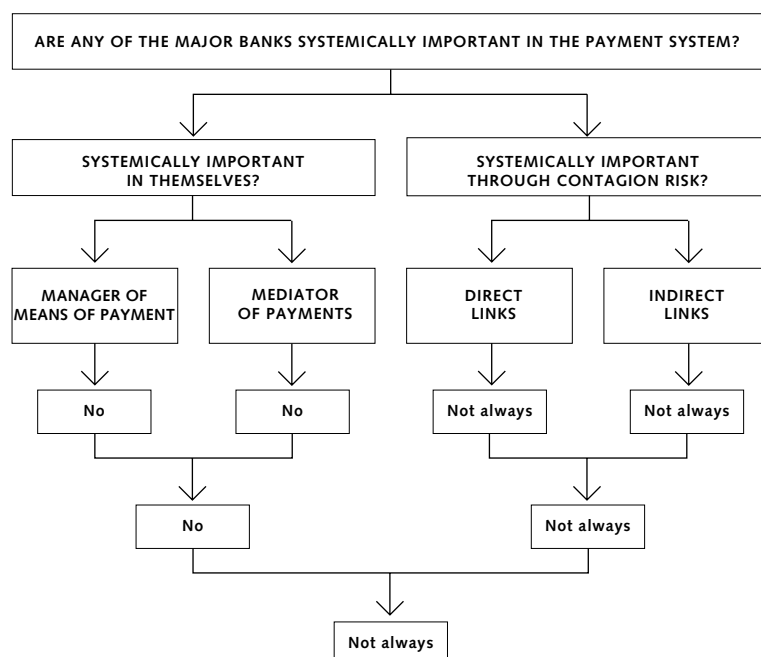
Conclusions

There are two conditions for an individual bank to be regarded as systemically important from a payment system perspective: (A) the individual bank is necessary for the functioning of the payment system. (B) There are direct or indirect contagion risks from the bank to other banks of such a scope that its failure risks causing other banks to fail. Most indications are that no Swedish bank is systemically important according to the first criterion, as the lock-in effect is relatively limited and as it is probably possible for most of the bank's customers to fill the gap in payment intermediation left by a defaulting bank without too much delay. On the other hand, there is greater uncertainty as to whether any of the banks is systemically important according to the other criterion. The Riksbank's statistics indicate that the contagion risk between the banks is at times manageable, but that in certain situations there may be direct exposures that could result in contagion. These take the form of counterparty and settlement exposures, as well as liquidity exposures from the mediation of payments. The indirect contagion risk can also be considerable in cases where the cause of a bank failure is uncertain or there is uncertainty as to whether other banks have direct exposures to this bank or exposures similar to the bank's.

All in all, three conclusions can be drawn from this analysis:

1. None of the four major banks is systemically important in itself from a payment system perspective, that is to say, if contagion risks are not taken into account.

SUMMARY OF ANALYSIS



2. The contagion risk is not always so great that the failure of a major bank would result in one of the others failing.
3. Thus, none of the four major banks is always systemically important from a payment system perspective.

The analysis also implies that it is unlikely that any other financial institutions than the four major banks would be systemically important. However, it is important to remember that the above analysis has only analysed a situation where *one* major bank was initially affected by problems. As the banks have similar exposures and operations, they risk in some cases being affected by problems at the same time. Together the four major banks are systemically important, which motivates supervision and regulation, even if they are not systemically important individually.

THE ROLES OF THE RIKSDAG AND THE RIKSBANK

It is the banks' importance for the functioning of the payment system that is the main reason for the special regulation and supervision of the banks,⁶⁶ and the reason why the Riksbank has the possibility of providing emergency liquidity assistance and why the Riksdag has in certain cases decided to provide solvency support. This means that the direct and indirect costs of saving a bank suffering problems for the purpose of preserving the payment system are usually perceived as lower than the cost to society of the payment system being put out of function. In line with this reasoning, banks that are systemically important to the payment system and are at the same time solvent, could be given emergency liquidity assistance by the Riksbank, if no other solutions to save the payment system were on offer. If they were not solvent, there might also be a possibility of other support from the central government. In cases where the banks are not systemically important to the payment system, this support is not a matter of course, either from the Riksbank or from the Riksdag. As the analysis above illustrates, the Swedish banks are not always systemically important to the payment system individually and it is thus not necessarily the case that the banks would always qualify for support from the central government.

When a bank fails, other costs arise in addition to those stemming from disruptions to the payment system. The banks are important for the supply of capital in the economy and if this is disrupted it can have repercussions for growth. The banks also play an important role in companies' and households' capacity to manage risk and thus their willingness to invest, save and implement other transactions. In addition, a bank failure risks resulting in general economic uncertainty. A further aspect is that there is a risk of some capital destruction when a bank fails, in that built-up investments risk being lost. For banks the capital destruction will probably mainly consist of information costs, such as, the information the bank has on individual borrowers' creditworthiness, which may have been built up over a long period of time. However, it can be debated

⁶⁶ This view is shared by the Banking Law Committee's report.

whether bank failure would really give rise to greater costs than other company failures of comparable size, particularly as the information need not be lost if credit portfolios, personnel and information systems can be taken over by other institutions during crisis management.

When a bank fails, the Riksbank and the Riksdag thus need to consider factors for and against emergency liquidity assistance or solvency support respectively. One factor in favour of granting liquidity assistance or solvency support is the assessment of the costs of disruptions to the payment system and capital supply, which could vary from efficiency losses to a total breakdown. It will often be difficult to determine with any certainty how great these disruptions will be. The degree of uncertainty of the assessment will therefore also become a factor that needs to be taken into account in the decision. Factors against granting emergency liquidity assistance and solvency support are the uncertainty regarding the bank's solvency now and in the long term, the distortion in competition and the difficult-to-define cost of moral hazard. These assessments are also connected with considerable uncertainty.

In this type of situation, the Riksbank would also have to consider alternative means of managing the problem. As the analysis showed, one bank in itself is probably in no case essential to the functioning of the payment system. It should therefore be possible to allow the bank suffering problems to fail and to aim any measures at assisting the banks suffering contagion effects from the defaulting bank. The corresponding possibility should exist for the Riksdag, if it considers itself obliged to provide financial support to the bank sector.

POSSIBILITIES TO REDUCE SYSTEMIC IMPORTANCE

The more clearly it can be shown that individual banks are not always systemically important and credibly claimed that support need not be aimed at institutions suffering problems, the lower the moral hazard and indirect contagion risks in the system. One of the most important measures the authorities can take to reduce systemic importance among individual institutions is to have carefully-prepared crisis regulations. The structure of these crisis regulations should be such that one can quickly resolve a bank failure and release locked-in funds.⁶⁷ In addition, the authorities should be well-prepared to manage a bank failure. There would probably be little time available for making decisions in the event of a bank failure. It would thus be easy for the authorities to choose to support the afflicted banks as the negative consequences of allowing a bank that qualifies for support to fail are much more tangible than the negative consequences of rescuing a bank that does not actually qualify for support. It is therefore important that the authorities have a carefully-planned analysis and policy assessment for as to whether a bank qualifies for support. This applies to the Riksbank, Finansinspektionen and the Ministry of Finance.

⁶⁷ There is a commission proposal in this field being considered up by the Ministry of Finance, concerning special regulations for crisis management; "Public administration of banks in crisis" (SOU2002:66).

In addition to having structures for managing a bank failure, the authorities can also work to reduce the contagion effects before a failure occurs. The Riksbank, for instance, works on continuously assessing the financial infrastructure, which includes examining how it would manage the failure of an individual operator. Another project that the Riksbank has pursued for several years now is to convince the banks to reduce their counterparty and settlement exposures by, for instance, illustrating the risks they entail. One important change that will take place this year is that the krona will be included in the CLS bank currencies, which should significantly reduce the banks' foreign exchange risks.

The Riksbank can also establish clearer routines in the event of a bank failure for rapid communication of interbank exposures, joint counterparties and the reason for the failure. This could reduce the indirect contagion risk and thereby reduce the systemic importance of the individual banks. In order to reduce the risk of contagion via the securities markets in connection with a bank failure, the advantages and disadvantages of a shorter settlement cycle could be studied more closely.

Although the analysis indicates that the lock-in effect in itself does not comprise a systemic threat, any possible measures should be taken to reduce its duration. Reducing the lock-in period would reduce its effects and this is an area that requires further work. One possibility is to review the IGN's administrative capacity to pay out compensation within a reasonable time to a large number of depositors. Another is to establish routines for transferring custodies and the role of depository agent and settlement agent from the defaulting bank to other institutions in connection with a bank failure. Responsibility for drawing up such routines lies primarily with VPC and its members. The more customers with more than one bank contact, the lower the lock-in effect. At the same time, the system of a deposit guarantee as well as the general public's expectation that the central government will rescue banks suffering problems mean that they do not see a need for more than one bank contact. Further analysis is required as to how the authorities should handle this.

The Riksbank can also adapt its emergency liquidity assistance facility to support the banks and other payment system participants afflicted by the failure of another bank. One project that has been started up at the Riksbank is to survey the payment flows in RIX to increase knowledge of system-threatening imbalances in the payment system. This information is useful in particular when drawing up potential rescue measures aimed at other institutions than the one initially affected.

All in all, no individual Swedish major bank is always of systemic importance to the payment system at present. It is therefore not certain that it would be offered support by the central government, either in the form of emergency liquidity assistance from the Riksbank or solvency support from the Riksdag, if it should suffer financial problems. There are also a number of areas that can be developed to reduce the banks' systemic importance even further. A lower level of systemic importance means a lower risk that problems will spread between the banks, will reduce the moral hazard problem and ultimately lead to a lower risk of costs to society in connection with possible future rescue operations.