The Riksbank's role as lender of last resort

To safeguard the stability of the financial system, the Riksbank has the opportunity to act as "lender of last resort", or to provide guarantees to banks and other financial companies under the supervision of Finansinspektionen. The Riksbank has a unique capacity to create means of payment in Swedish krona and can therefore act as "lender of last resort", that is to say, when an institution cannot acquire means of payment in another way it may turn to the Riksbank. This article describes the Riksbank's views on its role as lender of last resort. There is a need to discuss the principles regarding which situations and which conditions shall apply for granting emergency liquidity assistance.

Introduction

The Riksbank's role as "lender of last resort" should be viewed in the light of the bank's objective of promoting a safe and efficient payment system. This task falls naturally to the Riksbank, which has a unique capacity to create means of payment in kronor. Both banknotes and coins, and funds in accounts with the commercial banks and the Riksbank function as a means of payment.[38]

The Riksbank supplies the banks with means of payment in several different ways. To enable interbank payments to be executed efficiently, the Riksbank offers an account and settlement system (the RIX system) in which the major banks participate. The banks that are not members of RIX and thus have no account with the Riksbank have accounts with the member banks and settle their payments via them. RIX is a real-time gross settlement system, which means that payments are settled as they are made.[39] This means that payments flow into and out of the banks during the day. As inward and outward payments are not usually of equal size, varying imbalances arise in the banks' liquidity, that is to say, the banks sometimes have surpluses or deficits in their accounts with the Riksbank. A bank has permission to have a deficit in its RIX account on condition that it has pledged collateral in the form of certain approved securities which will cover the deficit. In this way the Riksbank supplies the banks with means of payment during the day. These short-term loans, known as intraday loans, are interest-free.

The banks that are members of the RIX system can also borrow from the Riksbank against collateral overnight (the lending facility), but then they must pay interest. As this interest rate is higher than the interest rate on deposits with the Riksbank (the deposit facility), the banks have an incentive to balance liquidity amongst themselves on the interbank market. In this market, moreover, it is possible to borrow without collateral.

38 Means of payment are also created outside of the banking system, for instance, by independent credit card companies, but these companies are not dependent on a lender of last resort in the same way as the banks and are therefore not included here. For further information, see the Banking Law Committee report SOU 1998:160.

39 See the Riksbank's website www.riksbank.com for information on the RIX system.

The Riksbank also supplies the banks with notes and coins. The banks can collect as much cash as they need from the Riksbank's subsidiary SKAB, on condition that they can pledge approved collateral. Payment for the cash collected by the banks is exacted in the form of debiting their RIX accounts with the corresponding amount. To ensure that the banking system as a whole does not have a deficit with the Riksbank, the Riksbank issues what are known as monetary policy repos, which in principle mean that the Riksbank provides loans against collateral. However, these loans are not aimed at specific institutions.[40]

A bank participating in the RIX system thus always has access to means of payment as long as it can pledge collateral that will be accepted by the system. Other banks are dependent on the banks participating in RIX for their supply of means of payment. A bank with a means of payment deficit, and which cannot for some reason borrow on the interbank market or otherwise obtain means of payment on its own, for instance, by selling securities, or borrow from another party in the economy, must turn to the Riksbank. In this sense the Riksbank is the lender of last resort (LOLR).

The Riksbank can remedy a bank's liquidity problems in several different ways. For instance, the Riksbank can grant credit on special terms, what is known as emergency liquidity assistance (ELA). By lending against other collateral than those normally required (or to other institutions than those normally permitted to borrow in RIX) the Riksbank can rapidly increase the amount of means of payment in the economy and thereby avert liquidity crises. An alternative means for the Riksbank to increase liquidity quickly is to issue guarantees that enable an institution lacking collateral to borrow in the market. This guarantee option may be preferable at times, as it enables the distressed institution to maintain its normal contacts in the market, but it is also emergency liquidity assistance and calls for the same type of decision as credit.[41]

The purpose of this article is to describe the Riksbank's view on its role as LOLR. The question of how transparent a central bank should be in this respect is rather controversial. Some central banks appear unwilling to even discuss the possibility of possible LOLR operations for fear that this could have a negative effect on financial institutions' behaviour, that is to say, that moral hazard could lead to a deterioration in risk management and to greater risk-taking in the banking system. The Riksbank, on the other hand, sees openness as a means of reducing moral hazard. This difference in views is probably based on differing historical experiences. Sweden, which as recently as ten years ago issued general guarantees to mitigate a crisis in the banking sector, sees openness that provides the clearest possible guidelines as to how a crisis will be managed in the future as a way of reducing expectations that similar rescue actions will be taken in all crisis situations. An open attitude, which establishes

40 See Mitlid and Vesterlund, Sveriges Riksbank Economic Review, 2001:1 for a description of the Riksbank's monetary policy steering system.

41 According to the Sveriges Riksbank Act, in exceptional circumstances, the Riksbank may, with the aim of supporting liquidity, grant credits or provide guarantees on special terms to banking institutions and Swedish companies that are under the supervision of Finansinspektionen, the Swedish Financial Supervisory Authority.

boundaries and game rules within the framework of a well thought-out crisis management system is therefore best for Sweden. A well reasoned stance on the issue of ELA reduces the risk of granting assistance unnecessarily, while clear principles for emergency liquidity assistance can serve as a defence against strong pressure that the Riksbank shall act as lender of last resort in less appropriate situations.

The need for a lender of last resort

The main reason for a central bank to need to act as lender of last resort is that a payment default by an individual financial institution, particularly a bank, can threaten the financial system's capacity to function. The financial system fulfils a number of important functions in society. These include supplying payment services, facilitating the supply of capital and enabling rational management of different risks. A payment default that leads to a bank being declared bankrupt can cause a systemic crisis, if the bank – because of a dominant position – is important for a certain function, for instance, the payment system. However, a payment default in a bank can also threaten the functioning of the financial system in that it gives rise to contagion effects in the rest of the financial system. It could be very costly to society if one of the financial system's vital functions were put at risk. The risk of disruptions to the system thus motivates both special regulations and supervision of banks and is the most important motive for a central bank needing to provide ELA. The existence of systemic risks is also the reason why the Riksbank monitors and analyses the stability of the financial system.[42]

CONTAGION EFFECTS FROM A PAYMENT DEFAULT

Contagion effects can arise both as a result of indirect and of more direct economic links between banks and between banks and other financial institutions. Direct links between the institutions can arise, for instance, when they borrow from one another or via the exposures arising in trade in the financial markets. Indirect links can arise through large sell-offs from one distressed institution negatively affecting other institutions through a fall in the value of the their assets. However, contagion effects can above all arise as a result of banking operations suffering stability problems, which mean that it suffices for the bank's financiers to distrust the bank's ability to pay in order for the bank to experience payment problems.

Banks' *assets* consist mainly of loans to companies and households. These loans are often difficult to evaluate – particularly for persons outside of the lending institution – and they are connected with credit risks. The difficulty in evaluating a bank's loan assets makes them *illiquid* in the sense that they cannot be sold quickly without having to make substantial discounts in relation to their actual worth. Borrowers may also experience difficulty in repaying their loans at short notice, as this usually

42 The Riksbank regularly publishes its views on financial stability in the Financial Stability Report.

requires them taking out loans elsewhere. The banks' *financing*, on the other hand, largely consists of deposits, which the depositors can withdraw at immediate notice, or other short-term credits, such as loans on the interbank market. This financing is therefore – unlike the assets – extremely *liquid*. Financing long-term projects with short-term funding and converting illiquid assets (loans) to liquid assets for the banks' financiers (deposits) is one of the banks' most important functions in the economy. However, it means that banking activities have certain inherent stability problems.

The differing natures of a bank's assets and liabilities with regard to risk and liquidity comprise no problem as long as there is confidence in the bank's ability to pay. It is then sufficient that the bank has a buffer of liquid funds[43] to manage fluctuations in withdrawals as well as other commitments. However, if the bank's ability to pay its debts is called into question for some reason, the differences in nature of the assets and liabilities could be a threat to its survival. The bank's financiers will then wish to withdraw their financing as quickly as possible to avoid being the last in line and thus risk the bank no longer having the ability to pay its debts. To meet all of the payment demands made upon it, the bank may need to realise assets on a large scale and at a rapid rate. As its assets can only be divested quickly if sold at a large discount, selling them off may mean that the bank's asset value falls below its liabilities, thus the bank becomes insolvent. In this way, even unfounded suspicions regarding a bank's ability to pay may become a self-fulfilling prophecy.

The stability problems in banking operations can lead to contagion effects arising merely because of uncertainty over the links between the institution in crisis and other institutions. If the financiers suspect there are financial links between the institutions, they may withdraw their financing from other banks as well, which can in turn lead to a domino effect. The risk of domino effects in the financial system is the main motive for the Riksbank to act as lender of last resort. By creating confidence in the bank's ability to pay, the Riksbank can avert a financial crisis.

BANK RUNS BY DEPOSITORS AND OTHER STABILITY PROBLEMS

The central bank's role as lender of last resort is originally connected to its capacity to issue banknotes and coins that are generally-accepted means of payment and the risk that depositors in the banks will wish to convert their deposits into cash.[44] Bank runs by depositors have occurred in most countries.[45] However, the risk of these has been reduced in Sweden, as in many other countries, through the introduction of a *deposit guarantee*. As the depositors can withdraw at least part of their deposits

43 This buffer may consist, for instance, of cash and liquid securities, as well as credit limits with other companies. However, the latter may be an uncertain liquidity asset in a crisis situation.

44 Originally, the need of a lender of last resort was not merely connected to deposits. During a large part of the 19th century, private banks issued their own banknotes in Sweden. These banknotes could be redeemed for Riksbank notes or gold. As the banks' cash supply did not cover the notes they issued, there were bank runs to redeem the notes when confidence in the bank was shaken.

45 See, for instance, Gorton, G. (1988) "Banking Panics and Business Cycles", *Oxford Economic Papers*, 40, 751–781 for a description of bank runs in the United States.

even if the bank becomes insolvent, they do not have the same reason to rush to the bank and withdraw their money if confidence in the bank's ability to pay is shaken.[46] In this respect, banking operations have become more stable. Moreover, in recent years bank runs have been observed primarily in countries suffering a general economic and political crisis, such as Argentina at the beginning of 2000.

In other aspects, banking operations have become less stable. Banks also have other short-term funding than guaranteed deposits. In particular, they borrow large amounts from one another in the overnight market. Swedish banks are also borrowing increasingly in the international interbank market.[47] Furthermore, the banks make use of several financial markets to manage their liquidity. The banks' liquidity management is thus dependent on both the interbank trade and on other financial markets functioning efficiently. Both real cases and economic research have shown that this is not always the case.[48]

Interbank trading is largely based on trust. The participants do not have complete information on one another and confidence can be shaken as a result of actual disturbances or simple rumours. For instance, confidence in all of the Swedish banks was shaken during the Swedish bank crisis, *including* the banks that did not need a capital infusion from the central government, as foreign investors did not have sufficient information to discern the problems in the Swedish banks. If suspicion arises against one participant, this institution will not be able to obtain financing in the interbank market, unless it can provide adequate collateral. This can be sufficient for the bank in question to suffer an acute liquidity shortage, as it has assumed in its liquidity planning that it will be able to borrow without collateral.

If an individual bank suffers liquidity problems as a result of lack of coordination between participants in the interbank market, the Riksbank can try to assist by supplying the market with information. However, one problem is that liquidity problems may need to be solved very quickly to prevent a payment default, which means there may not be time to coordinate market participants.

The banks' liquidity management is also dependent on technical systems and technical problems can lead to an acute liquidity shortage. This happened to, for instance, the Bank of New York in 1985, when a technical problem meant that the bank was unable to accept payment for securities the bank had purchased on behalf of customers, which led to the bank accumulating a gigantic liquidity deficit that could not be financed in the market. The bank was given credit by the Federal Re-

46 The way the Swedish guarantee is designed, bank depositors still have some incentive to withdraw their deposits if there is a risk of bankruptcy; this is because it can take several days (in exceptional cases up to six months) before the compensation is paid and because it only covers deposits up to SEK 250,000 in a bank.

47 See the article on financial integration in this report.

48 See, for instance, "Lender of Last Resort: What have we learned since Bagehot?" *Journal of Financial Services Research* 18:1, pp. 63–84, 2000, by Freixas et al for a review of the economic literature and "Financial Crisis, Payment System Problems and Discount Window Lending", *Journal of Money, Credit and Banking*, 28, pp. 804-824 for an analysis of the liquidity problem in the market. However, this conclusion is rather controversial. For instance, Goodfriend and King argue that sophisticated interbank markets have made emergency liquidity assistance an unnecessary instrument ("Financial Deregulation, Monetary Policy and Central Banking", in *Restructuring Banking and Financial Services in America*, Haraf W. and R.M. Kushmeider eds., AEI Studies, 481, Lanham Md, USA).

serve, the central bank of the United States, until the technical problem was resolved.[49]

It may seem that the risk of technical faults should decline over time as systems are further developed, but this is not self-evident as the systems are also becoming increasingly complicated and integrated. There is also a risk that increased internationalisation and integration of the financial markets, which usually leads to more efficient markets with greater depth and better liquidity, could increase information problems in times of unrest, and thereby the risk that liquidity will not be allocated efficiently.

The conclusion is thus that there is still a need for a lender of last resort, even with sophisticated financial markets and technical systems. Problems can still arise that prevent the market from allocating liquidity efficiently – market failures occur. One practical difference from before is that ELA will not usually be paid out in banknotes; rather the bank will be allowed to have a deficit on its account with the Riksbank without the usual collateral requirement.[50] A real difference is that the problems tend to spread much more quickly the more the financial system develops. In an undeveloped system, the depositors need to physically go to the bank to withdraw their deposits, but in a technically advanced system large sums can be withdrawn in a very short period of time.

EMERGENCY LIQUIDITY ASSISTANCE PRIMARILY FOR BANKS

It is primarily if a *bank* suffers liquidity problems that the Riksbank has reason to intervene. The banks' operations are essential to the functioning of the financial system and thereby to the economy as a whole, while banking operations are characterised by inherent stability problems, which mean that liquidity shortages can rapidly lead to solvency problems.

Operations in financial infrastructure companies (VPC, Bankgirocentralen and Stockholmsbörsen) are of course also essential to the functioning of the financial system. However, these companies do not have any inherent stability problems that could lead to acute liquidity problems. This is connected with the fact that they, with the exception of Stockholmsbörsen's role with regard to clearing derivatives, only intermediate payments and supply financial instruments.[51]

Although it is primarily the banking system as a whole and the financial infrastructure companies in themselves that are essential to the functioning of the financial system, other companies than banks can give rise to contagion risks in the financial system, which could threaten its ability to function. For instance, contagion effects can arise via market prices. A company with liquidity problems that cannot obtain credit must sell assets. This pushes down the price of these assets. The price comes

49 See also a special topic in Financial Stability Report 2001:1 on incidents in Sweden that could lead to liquidity problems and Chapter 4 on Liquidity and liquidity risk in the same edition.
50 Possible emergency liquidity assistance to institutions that are not members of RIX will be paid out through a bank that is a member.
51 If and when a central counterparty is introduced for other financial assets than derivatives, this situation may change.

under further pressure due to the uncertainty over how large the sales of these assets will be. In the worst case, the market may cease functioning. As the financial markets are linked together by various financial instruments, problems in one market may also affect efficiency in other markets. One example of this type of contagion is the LTCM crisis in 1998. LTCM (Long Term Capital Management) was a hedge fund that had very large positions linked to the US interest swap market. LTCM was prevented from going bankrupt by 14 banks agreeing to supply funds to continue operating LTCM and to achieve a controlled settlement of its positions. In this way the functioning of the financial system was saved. The agreement was the initiative of the Federal Reserve, although it did not contribute any funds. It is uncertain what would have happened if an agreement had not been reached. Many banks had large exposures to hedge funds, whose financial positions were negatively affected by the severe price fall. In addition, many banks had positions similar to LTCM. There was thus a risk that confidence in the banks would be shaken if the crisis had continued. The crisis was triggered by the fact that the fund suffered large losses and was therefore in need of capital support rather than liquidity support. However, a general market breakdown could make it necessary for the central bank to ease its collateral requirement and also lend to other institutions than banks.

The cost of emergency liquidity assistance – moral hazard

Although the really serious costs to society arise if a crisis in an individual institution gives rise to contagion effects in other parts of the financial system so that one of its vital functions is put at risk, there is also a cost to the economy if economically-sound companies are forced into liquidation as a result of pure liquidity problems. There may therefore be situations where a motive exists for providing ELA even where a payment default would not comprise a systemic threat. However, in each emergency liquidity situation it is necessary to weigh the benefit to the economy of providing the assistance against the negative incentive effects the measure might have.

The possibility for a bank to receive ELA from the Riksbank functions as a liquidity insurance for the bank and like all other insurances this risks having a negative effect on the bank's behaviour, what is known as moral hazard. It is important not to reduce the bank's incentive to plan and manage its liquidity. The purpose of this article, as pointed out earlier, is to reduce moral hazard by making clear the circumstances and conditions that apply for ELA.

Liquidity problems can arise as a result of a bank actually lacking sufficient ability to pay; that is to say, the distrust of the bank is well-founded. This is probably the most common reason for a bank suffering liquidity problems, even if banking operations are safeguarded by extensive regulations and supervision to reduce the risk of a bank experiencing solvency problems. To avoid the unnecessary retention of inefficient banks and distorting bank behaviour, *the Riksbank should not support* *banks that lack long-term survival capacity*. If a bank's shareholders assume that the central bank will come to the rescue in the case of problems, this not only reduces the incentive to plan and manage liquidity, it also increases the incentive to take risks, which is a much worse moral hazard problem. In addition, the bank's financiers' incentive to monitor the bank's risk-taking and management is weakened. This in turn leads to poorer pricing of risk, which can further increase risk-taking. *Emergency liquidity assistance should thus only be given to overcome liquidity problems arising as a result of inefficient market allocation of liquidity*.

However, decisions on ELA are almost never made on the basis of perfect information. In actual fact, there may be great uncertainty with regard to both the actual financial condition of the institution affected and to the extent of the risk that the problems will spread to other parts of the financial system – systemic threat. The assessments of systemic risk contain a significant element of psychology, for instance; they involve predicting how market participants – both domestic and external – will react to certain events. Moreover, the decision usually needs to be taken under great pressure to avoid the institution defaulting on its payments.

In general, those making the decision on ELA run the risk of making two types of error: firstly intervening when it is unjustified and secondly failing to intervene when an intervention is really warranted. Often the immediate costs (in particular the political costs) of not intervening to assist a solvent bank can be subjectively perceived as higher than the costs of assisting a bank that is not solvent. At the same time, it is almost unavoidable that the tendency to refrain from granting liquidity assistance declines where systemic risk is substantial, even if the assessment of the institution's ability to pay is uncertain. In this situation, there is thus an increased risk of intervening when an intervention is unwarranted. Combined with the difficulties of determining both the bank's financial position and the systemic threats in a liquidity crisis, this risks seriously aggravating the moral hazard problem. It is essential, in order to manage this problem, that the roles of the various authorities are clearly defined and that the authorities are well-prepared and coordinated prior to a crisis.

Cooperation and allocation of responsibilities between the relevant authorities in a crisis situation

The ever more rapid course of financial sequences of events increases the demands on the authorities' capacity to react in a financial crisis. This means that they must be able to rapidly analyse a situation, which in turn underlines the need to have reliable information to hand at an early stage. In practice, the quality of the crisis management depends to a great extent on the access to rapid and reliable information and on earlier assessments of how systemic threats can arise and develop.

Making good analyses also requires, in addition to direct contacts with the banks, far-reaching cooperation agreements between authorities, both within Sweden and between Swedish and international authorities. A memorandum of understanding was recently established by the

Riksbank and Finansinspektionen (the Swedish Financial Supervisory Authority). The banking groups increasingly cross-border activities have also led to greater efforts at cooperation between authorities in different countries. In particular, Nordea's pan-Nordic development has led to increased cooperation and a consultation agreement between the Nordic central banks and supervisory authorities. However, it is also essential that there is a clear allocation of roles between *government* and *central bank*.

The central bank should not provide ELA to banks with solvency problems, for the reasons mentioned above. Unprofitable banks should be reconstructed or liquidated. However, the general regulations on insolvency cannot always be appropriately applied to banks; a systemic crisis could be triggered through the direct and indirect links between institutions in the financial markets.[52] A bank may therefore need to be reconstructed or liquidated under other forms. This should preferably be done without intervention from the central government. However, to increase the likelihood of a private solution, the Riksbank or Finansinspektionen can function as a "mediator" between the problem institution and potential financiers.

The Riksbank also has the possibility to reduce systemic risks connected with the general regulations by providing liquidity assistance to banks suffering liquidity problems when a problem institution is declared bankrupt. In this way the general regulations can be applied in several situations.

If government capital infusions are nevertheless necessary to prevent a failure causing a systemic crisis, the responsibility lies with the government and parliament. The Riksbank can of course provide assistance in the practical implementation and in the form of analyses in cases where institutions must be reconstructed. The Riksbank can execute the decisions, but should not take them.[53]

In acute liquidity crises, where there is no time to await a decision by parliament, the government must be able to make a decision on a government guarantee. To avoid the government and the Riksbank facing a blackmail situation, where an institution suffering problems utilises its systemic importance to demand support on favourable terms, it is essential to have a well-developed and credible crisis management system similar to that proposed by the Banking Law Committee in its final report.[54] This type of system could reduce the moral-hazard problem by making it clear that it is primarily the bank's shareholders and after them other creditors who would bear any losses. The possibility for

52 See the Banking Law Committee's final report for an analysis of the problems in applying the general insolvency legislation to banks.

53 This allocation of labour is described in the prepatory documents for the prevailing emergency credit provision in the Sveriges Riksbank Act. There it is stated that the Riksbank may not provide liquidity assistance out of hand to an evidently insolvent institution. A potential problem with this statement is that whether or not an institution is insolvent in the *legal* sense may depend on whether emergency credit is granted. It must therefore be assumed that in the preliminary work insolvency means in the sense of English-language *economic* literature, i.e. unsound (see the Banking Law Committee's final report, SOU 2000:66) and to avoid misunderstanding it is here termed non-solvent. With this interpretation, the Riksbank's view of how emergency liquidity assistance should be applied agrees with the present system.

the Riksbank to provide emergency liquidity assistance to other banks in a situation where an insolvent bank cancels its payments, in order to reduce contagion effects and to avoid the system as a whole being threatened, may also reduce the risk of the central government being blackmailed.

Finansinspektionen has an important task with regard to detecting problems in systemically important institutions in good time to enable them to be managed without government support or emergency liquidity assistance. In this way the costs for crisis management can be limited. Finansinspektionen is also the authority that holds the most information on individual institutions. When the Riksbank receives a request for ELA, it will contact Finansinspektionen with regard to assessing the institution's financial position.

According to the present laws, the Deposit Guarantee Board is unable to assist in averting financial crises; deposit guarantee funds can only be used to pay out compensation in the case of bankruptcy. A change in the regulations in the manner proposed by the Banking Law Committee[55] would mean that these funds could be used for reconstruction, if this would entail lower costs for the guarantee system. Such a system would reduce the need to use tax revenue for reconstruction of systemically-important banks.

Important assessment factors – solvency and systemic risk

The Riksbank should not, as mentioned earlier, provide emergency liquidity assistance to institutions lacking long-term survival capacity, that is to say, insolvent institutions. The Riksbank must therefore assess an institution's solvency. It must also assess the *systemic risk*. In a case where a insolvent institution comprises a systemic risk, the government and parliament will, in accordance with the above distribution of labour, decide on financial support. This section provides an account of the principles that will form the basis for the Riksbank's assessment of an institution's solvency and the systemic risk.

THE INSTITUTION'S SOLVENCY

Emergency liquidity assistance is aimed at avoiding costs to the economy by helping an otherwise vital company out of liquidity problems caused by market failures. The solvency assessment should therefore be primarily aimed at an assessment of the institution's long-term survival capacity. It is therefore not merely the risk of the Riksbank suffering loan losses that determines whether or not a bank shall receive liquidity assistance. A bank will not become more solvent because the central bank's credit risk is reduced, for instance because the central bank's claims have the highest priority. However, the institution's capacity to pledge collateral should be a good indication of its solvency in many cases.

54 See SOU 2000:66.
55 See SOU 2000:66, Chapter 9.

An evaluation of the institution's assets forms the basis for an assessment of its long-term survival capacity. This assessment is made more complicated by a large part of a bank's assets lacking a secondary market and are particularly difficult to evaluate in a crisis situation, particularly if this has been caused by macro-economic shocks. The Riksbank makes regular assessments of the major banks' portfolios, but in a crisis situation it would be necessary to have updated information directly from the institution. The possibility to gain a good understanding of the banks' portfolios will probably increase with the introduction of the Basel Committee's proposal for new capital adequacy rules, as these make greater demands of both the institutions and the supervisory authorities to measure portfolio risks.

However, it is not sufficient that the value of the assets is greater than the liabilities (given a "fair" evaluation) for an institution to be solvent. It is also necessary that the bank has the capacity to generate future profits. To assess the institution's long-term survival capacity it may therefore be necessary to make in-depth analyses of the company's business model, in addition to an assessment of the asset values. In this context, the definition of long-term is determined by how far into the future it is in practice possible to survey the company's cash-flows, not usually longer than one to two years. The Riksbank makes regular assessments of the major banks' operations in order to assess the future stability of the banking system and these can be used as a basis for evaluating a problem bank's survival capacity.

One complicating circumstance is the fact that banks have a capital adequacy requirement. The purpose of the capital adequacy requirement is to reduce the risk that a bank will suffer solvency problems; this capital shall function as a buffer against losses. A company is not allowed to maintain its licence to conduct banking operations if it fails to fulfil the capital adequacy requirement. The bank has a limited period in which to restore the capital. If it does not succeed, the banking licence will be withdrawn and the bank will be liquidated, which risks leading to capital losses. There is therefore a risk that a bank which has positive equity capital and is solvent, but which has suffered losses and therefore fails to meet the capital adequacy requirement, will experience liquidity problems. As it is important that the capital can function as a buffer against losses and that a solvent bank is not forced into liquidation as a result of liquidity problems, there may be reason to provide ELA to a bank that does not meet the capital adequacy requirement. A decisive factor in the decision on ELA is whether the bank has the capacity to resolve its capital problems on its own. If the institution needs help to solve its capital problems, but is assessed to otherwise have a long term survival capacity, credit should only be given as part of a credible and sustainable reconstruction package.

It is very difficult to determine *for certain* in the short-term whether or not an institution is solvent. Accounting data is not usually collected or updated more often than once a quarter and capital adequacy is retrospective, like all accounting, which means that a bank can fulfil the capital adequacy requirement although its assets are actually worth less than its liabilities. At the same time as the possibility to provide liquidity support gives the Riksbank an important tool to prevent pure expectations-driven bankruptcies and to safeguard system stability, there is good reason for the Riksbank to be aware of the moral-hazard problem and try to counter it, as already pointed out. The Riksbank therefore has reason to take into account the uncertainty in assessing the institution's solvency when deciding on ELA and to be more *restrictive* when the assessment is more *uncertain*.

SYSTEMIC RISK

The systemic risk consists of a threat that one of the financial system's functions will be seriously damaged. The Riksbank's point of departure is that it is primarily the *payment system* function that needs to be safeguarded. In Sweden this function is dependent to a large extent on the operations of the four largest banks and it is quite clear that if all of these four were to fail, the payment system would collapse. However, this does not mean that each of these banks is systemically important in itself.

An article in the previous Financial Stability Report analysed in greater detail the systemic importance of the major banks to the payment system.[56] The conclusion of this article is that no individual bank is at present indispensable to the functioning of the payment system. This is partly due to the fact that the lock-in effect on funds is relatively limited, due to the deposit guarantee and partly to the fact that it is relatively simple for another institution to take over the intermediation of payments function from a bank in liquidation. Another conclusion is that it is unlikely that a payment failure in any other institution than the four major banks could threaten the functioning of the payment system. On the other hand, the scope of the indirect contagion risks between the banks in particular is uncertain and there may be a possibility that a payment default by a *major bank* could in some cases lead to other banks failing and thereby threaten the functioning of the payment system. However, these risks are *not always* of such a scale that the functioning of the payment system would be threatened if a major bank were declared bankrupt.

Although the need of protection is greatest with regard to the payment system, it is not possible to draw any clear boundary lines between the different functions of the financial system: payment system, capital supply and risk management. For example, the fact that the banks supply liquid funds is a stage in the functions of both the payment system and capital supply and even to some extent risk management. As well as comprising the core of the payment system, the banks dominate the short-term loan market. Companies and households who lost their overdraft facilities might suffer payment problems if they could not obtain credit from another bank. As mentioned at the beginning, other banks may be unwilling to take over loans as they lack information on the borrower. One particular problem is that the capital adequacy rules may

56 "Can a bank failure threaten the payment system?" Financial Stability Report 2003:1.

comprise a restriction to other banks' possibilities to take over a failing bank's loan stock, particularly if a large portfolio is involved or if they themselves are in a strained financial situation. The requirement that a bank should cover the risk in its loan loss provisions with adequate capital means that it may experience difficulty in rapidly expanding the loan portfolio, particularly as it may be difficult for banks to make new issues in a crisis situation. In this type of situation borrowers may experience difficulties in renewing their loans, which could give rise to bankruptcies resulting in costly consequences for the economy as a whole. The problems will of course be magnified if several banks suffer problems at the same time.

The conclusion is that there may be reason to include the bank's function of supplying credit when assessing systemic risk. As there is greater diversity in the credit supply system than in the payment system, the need for protection should usually be less. At the same time, it can be concluded that the probability of another credit-granting institution than one of the major banks being systemically important to credit supply is largely non-existent.

One important consequence of the conclusion that not even one of the major banks is always important in itself for the functioning of the financial system is that one of these banks can be declared bankrupt if the potential contagion risks can be managed. On condition that a bankruptcy would only give rise to contagion effects in the form of liquidity problems, the Riksbank can manage these by providing ELA to other banks affected by the failing bank's payment default. In this way the functioning of the financial system can be maintained.

Conditions for emergency liquidity assistance

The concrete conditions for ELA are important as they can affect the institution's incentives to take risk in general and the moral-hazard problem in particular. According to the Sveriges Riksbank Act, it is the Riksbank's task to establish the conditions for granting ELA. This section contains a discussion of some of the most important conditions.

COLLATERAL – PLEDGE AGREEMENTS

By and large, a need of liquidity assistance can arise only if an institution is not in a position to pledge collateral that is normally accepted in interbank trading and in the RIX system. In a crisis situation, the Riksbank can consider accepting other assets as collateral, for example equity or loan claims. By accepting collateral, the Riksbank can reduce the risk of ELA becoming something else. When an application for ELA is made, it is reasonable that the Riksbank therefore assesses the institution's solvency and systemic risk as well as the collateral it can offer. It is natural to make a haircut to take into account the fact that the value can vary over time and that the assessment is uncertain.

LENDING RATE

The academic literature provides arguments for charging a higher as well as a lower than normal interest rate for emergency liquidity assistance. One of the first to contribute to theories of the central bank's role as lender of last resort was Bagehot.[57] According to him, ELA should be supplied without restriction in a crisis situation to every institution that can supply good collateral (according to evaluations before the crisis) at an interest cost that is high in relation to the lending rate prevailing before the crisis. The purpose of the high interest rate is to counteract moral hazard. Banks lacking good collateral or unable to pay the high interest rate should be allowed to fail, according to Bagehot. In their model, on the other hand, Rochet and Vives find that a very low interest rate on emergency liquidity assistance is optimal.[58]

The interest rate on ELA must be decided from case to case. There may be grounds for charging more than the normal lending rate in order to counter moral hazard. However, as the credits in this context have a short duration, the effect of charging more than the normal rate is limited. To act as a deterrent, the rate would no doubt need to be *considerably* higher than the normal lending rate. There would then be a risk of the purpose of the assistance being lost in that the high interest rate gives the bank problems with solvency.

ELA provided by the Riksbank would also be public information, even in the unlikely event that the markets had no knowledge of it. As the bank would probably be reluctant to advertise its liquidity problems, this should be sufficient incentive for a bank to request assistance only when it is really necessary.

FOREIGN CURRENCY

There could be a case where a bank applies for ELA for a liquidity shortage in a foreign currency, for instance if a bank has a loan in foreign currency that it is unable to renew for some reason. The Riksbank would then make an assessment, in the manner described above, of the institution's solvency and the potential systemic risk of a payment default. If ELA is granted, the Riksbank usually has no reason to provide loans in any other currency than Swedish kronor, as the bank should be able to exchange a loan on Swedish kronor to the desired currency on the swap market. If there is a lack of confidence in the bank's ability to pay, however, the bank may experience difficulty in finding a counterpart, as a swap agreement entails a credit risk. Nevertheless, the bank should be able to buy currency on the spot market, unless this has ceased to function. Buying currency would mean that the bank took on an undesired foreign exchange risk. To prevent the bank from carrying this risk, or if the spot market were not functioning at the present time, the Riksbank

---

57 Bagehot (1873), *A description of the money market*, London, H.S. King.
58 Rochet & Vives (2002), "Coordination failures and the Lender of Last Resort; was Bagehot right after all?", mimeo, INSEAD.

could provide loans in foreign currency to the bank or offer to make an outright swap, that is, to sign a forward contract with the bank. If an institution experiences an acute shortage of foreign currency, the Riksbank may choose to try to mediate between the lenders and the bank in question and if necessary to issue a guarantee to create confidence in the institution.

OTHER CONDITIONS

The Riksbank may also set other conditions in connection with ELA. For instance, the Riksbank could require that the bank take measures to increase its liquidity and thereby increase the likelihood that its liquidity problems are temporary. One means for a bank to increase liquidity could be to reduce the size of its loan portfolio, given that this occurs gradually. Another possible condition is a special requirement for access to information and reporting, which was applied during the bank crisis.

Conclusions

This article has taken up a number of issues concerning the Riksbank's role as *lender of last resort*. For instance, there has been discussion of the principles for which situations and which conditions should apply for emergency liquidity assistance (ELA). One conclusion is that the possibility to provide ELA gives the Riksbank an important tool to prevent purely expectations-driven payment failures and to safeguard system stability, although there is reason for the Riksbank to be cautious and counteract distortions in the institutions' behaviour, what is known as moral hazard.

To reduce the moral-hazard problem (and perhaps to avoid unnecessarily retaining inefficient banks in general), the liquidity support should only be given to *solvent* banks, that is to say, banks with a long-term survival capacity. Giving this type of system credibility requires a clear allocation of roles between the government and the Riksbank.

Unprofitable banks should be reconstructed or liquidated. This should primarily be done without any intervention from the central government and with the aid of private capital. If government capital infusions are nevertheless necessary to prevent a bank failure causing a systemic crisis, the responsibility lies with the government and parliament. Decisions on capital infusions should in principle be made by parliament. In acute liquidity crises, however, where there is no time to await a decision by parliament, the government must be able to make a decision on a government guarantee.

To avoid the government (or the Riksbank) facing a blackmail situation, where an institution suffering problems utilises its systemic importance to demand support, it is essential to have a well-developed and credible crisis management system similar to that proposed by the Banking Law Committee in its final report. This type of system could reduce the moral-hazard problem by making it clear that it is primarily the bank's shareholders and after them other creditors who would bear any losses.

The Riksbank works to reduce systemic risks from a payment default and the ensuing need for central government capital infusions to the banking sector. The contagion effects from a payment default can be reduced by the Riksbank providing liquidity support to the institutions suffering liquidity problems from the default. Thus, any insolvent institutions can be declared bankrupt without putting the functioning of the financial system at risk. The Riksbank (or Finansinspektionen) can also function as a mediator between institutions with problems and potential financiers to increase the likelihood of a private solution and the bank can be reconstructed without needing to use central government funds. Furthermore, the Riksbank can provide the market with information, for example about whether or not there is a systemic threat and its assessment of a crisis bank's financial situation. Such information can sometimes suffice to resolve the crisis.

One complication is that the decision on ELA cannot usually be made on the basis of complete information. Although the Riksbank regularly makes assessments of the major banks' portfolios and operations that may form the basis of an evaluation of a problem bank's survival capacity, updated information is needed in a crisis situation. As a decision on ELA usually has to be taken under considerable pressure to avoid the institution having to default on payments, there is not usually time to make a complete assessment of the institution's solvency. The immediate costs (in particular the political costs) of not intervening to assist a solvent bank can be perceived subjectively as higher than the costs of assisting a bank that is not solvent, which creates an almost unavoidable tendency to provide ELA when it is not necessary more often than to refuse it when it is warranted, particularly in cases where the systemic risk is potentially serious. As each case of ELA to insolvent institutions risks aggravating the moral-hazard problem, there is reason to be restrictive in granting this assistance and to carefully weigh the uncertainty of the solvency assessment when making its decision.

The Riksbank will also assess the systemic risks. If a payment default in an insolvent institution is assessed to threaten systemic stability, it is the government's responsibility to decide on financial support. The government shall weigh up the scope of the damage to the financial system caused by a failure against the risks of changing the incentives for market participants and preserving an unsuitable market structure. There is thus only reason to intervene when a non-solvent institution threatens to *seriously* damage the functioning of the financial system.

Explaining the allocation of roles between the authorities and clarifying the circumstances in which ELA might apply, should reduce the pressure on the Riksbank to grant assistance when it is unwarranted and create understanding for the policy pursued.

The Riksbank also intends to be as open as possible with regard to any lender of last resort measures taken. Transparency with regard to at least the fundamental features and the main motives behind a liquidity assistance operation could have great significance in building up the central bank's credibility towards both the general public and the financial institutions. The credibility of the central bank usually benefits if it gives a reliable picture of how it has acted and how it interprets its role. This can also affect the moral-hazard problem. This could be reduced in particular if the public treatment proved to be stricter than expected both with regard to the decision to grant ELA and the terms connected with the loan. For the Riksbank, openness regarding its actions will not only affect its credibility and influence on the moral-hazard problem, but may also comprise an element of its reporting to the Swedish parliament.

Finally, the EC regulations on central government support naturally have to be taken into account when making a decision on ELA. Each individual case must entail a balance between the need for competition neutrality and the interest in maintaining financial stability.