How has the Riksbank managed the financial crisis?

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Introduction

The Swedish Parliament is the principal for the Riksbank, and the Riksbank's mission is defined in the Sveriges Riksbank Act. In addition to maintaining price stability, the Riksbank is required to promote a safe and efficient payment system. Simply put, the Riksbank's two main tasks are to conduct monetary policy and to maintain the stability of the financial system. The first of these tasks, monetary policy, is no doubt familiar to most people, at least on a superficial level. Few people can be unaware, especially those who hold or are considering applying for a mortgage, that the Riksbank's Executive Board sets a "repo rate", which in turn affects the interest rates charged to those who borrow from the banks. The Riksbank's monetary-policy decisions generally attract a lot of attention in the media and are widely analysed and commented on. The Riksbank's other task – promoting a safe and efficient payment system – is probably less well known among the public. It rarely hits the headlines, except perhaps during those times when financial stability is under threat.

In this article we will attempt to explain the need for a public safety net for financial activities as well as the role played by the Riksbank and the tools it employs to promote financial stability. To do this, we first need to understand the significance of banks in the economy and the particular risks that are associated with banking activities. Another purpose is to present the concrete measures the Riksbank has taken during various phases of the financial crisis that is now entering its third year. In this context a brief review of the progress of the crisis will be helpful. Towards the end of the article we will also attempt to describe some of the effects that the measures have had so far. But before we address these issues, we should perhaps attempt to explain what is meant by financial stability.

What is financial stability?

Financial stability can be defined as a state where the financial system is able to perform its basic functions (e.g. to *transfer capital*, *perform payment services* and *manage various types of risk*) in a safe and efficient manner while also benefiting the economy as a whole. Financial stability is thus a necessary condition for a safe and efficient payment system.

Promoting financial stability is partly about reducing the risk of serious disruptions in the financial system that threaten the functionality of the system, and partly about minimising the negative social consequences if such disruptions were to occur. The task thus involves preventive measures as well as crisis management.

The fact that central banks, in particular, often have a role linked to the stability of the financial system is due to their special ability to add liquidity to the banking system. In order to describe this role in greater detail, we first need to understand what function the banks perform in the economy.

Banks help to ensure more efficient use of capital

Banks act as intermediaries between depositors and borrowers. Savers who want to spread their consumption evenly over their lives can deposit money in an account at a bank and withdraw it (plus interest) at a later time. At the same time the bank can issue loans to businesses and households that need to invest. The bank is a specialist in valuing, monitoring and managing credit risks in those households and businesses to which it lends. By using a bank, it is sufficient for private individuals or business owners to convince *the bank* of their own or their projects' creditworthiness; they do not need to convince a large number of individual savers/investors. Similarly, savers do not need to assess each borrower's creditworthiness or each project's potential to turn a profit; they only need to be convinced that *the bank* has a strong financial position to feel confident about depositing money in exchange for a return in the form of interest. It could be said that the bank hereby solves a problem created by the fact that all participants do not have access to the same information. The result is that the capital in the economy can be used more efficiently and benefit society in the form of more investment and thus higher growth and employment.

In addition to helping to allocate capital, banks also improve the efficiency of *payment* transactions in the economy. Each payment, except outright cash payments, involves a transfer between different bank accounts. This applies, for example, to payments made using a payment

card, credit card, giro transfer or cheque. These methods of making payments enable goods and services to be exchanged in a simple and economically efficient manner. It is the banks that provide the accounts that are used in these transactions. Many banks also participate in the system for settlement of large-value payments that is provided by the Riksbank, the RIX system.[1] The banks and their account systems thus constitute an important part of the payment system and of the economy as a whole.

Illiquid lending and liquid deposits and borrowing create instability in banks

The banks' assets consist largely of loans to businesses and households. These loans are subject to credit risks that are hard to value for outside parties. The difficulty of valuing the banks' loan assets makes them *illiquid* in the sense that they cannot quickly be sold without significant discounts to their longer-term value. Borrowers may also find it difficult to repay their loans at short notice, as this generally presupposes that they are able to obtain loans from somewhere else.

On the other hand, the banks' funding consists largely of deposits, which depositors can withdraw without prior notice, or of other short-term credits, such as borrowing in the interbank and securities markets. The banks' borrowing in securities markets is largely short-term. Unlike their assets, the banks' funding is thus extremely *liquid*.

Funding long-term projects using short-term funding and converting illiquid assets (lending) into liquid assets for the banks' funders (depositors) is thus one of the banks' key functions in society. As long there is confidence in a bank's solvency, the difference in liquidity between its assets and liabilities is not a problem. It is sufficient that the bank has a certain margin of liquid assets that enables it to manage normal fluctuations in deposits and other commitments.[2]

But if the bank's ability to pay its debts were for some reason to be put in doubt, this imbalance in liquidity could constitute a risk for the bank. If all depositors wanted to withdraw their deposited funds at the same time, or if funding in the securities markets were to be unavailable, the bank would face problems.

This is of course something that the bank's lenders realise. In order not to lose their money, all depositors would therefore want to withdraw their money as quickly as possible while other lenders would want to

[1] On an average day about SEK 400 billion flows through RIX.

[2] Efficient central payment systems and well-functioning interbank markets help to reduce the need for a margin in the form of a liquidity reserve.

withdraw their funding from the moment a bank is suspected of having financial problems. This is what is known as a *bank run*.

To meet all demands for payment, the bank may need to realise assets rapidly and on a large scale. But as the assets can only be sold quickly if they are sold at a large discount, a fire-sale of this type can quickly result in a situation where the bank's assets are worth less than its liabilities, i.e. where it faces solvency problems.

All that may be required to trigger a run on the bank, eventually forcing the bank to close down once it runs out of liquid assets, is an originally entirely unfounded rumour that the bank faces problems. An expectation of problems can thus become self-fulfilling. The big difference in the liquidity of their assets and liabilities thus creates an inherent instability in banks. This means that a bank is extremely dependent on the confidence of its customers and lenders.[3]

Bank runs have occurred many times in history. In fact, the creation of the Riksbank is itself the result of a bank run, which took place in the 1660s. The victim of the run was Sweden's first bank, *Stockholms Banco*.[4] Thanks to the introduction of various safeguards to protect depositors' money, the sight of depositors forming long queues outside banks to withdraw their money is now rare. Yet bank runs still occur from time to time, such as in Argentina and Malaysia around the turn of the millennium and in the United Kingdom, where the mortgage lender *Northern Rock* became the victim of a bank run as recently as September 2007.

As mentioned, a bank run does not necessarily involve only ordinary depositors. The share of bank funding that is provided through deposits from the public has gradually declined. Instead, a growing portion of banks' funding requirements is now met through borrowing in financial markets. The interest and currency risks that arise in these markets are managed in the derivatives markets. Banks have thus become increasingly

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3 One feature of the present crisis that needs to be commented on is that many banks around the world have to a large degree chosen to repackage their credit risks as quickly as possible and sell them on. It might be thought that the banks through this securitisation have also offloaded a large portion of their credit risks and thus made themselves less exposed to the possibility of a bank run. As we all know, the truth was quite the opposite. In practice, the explicit and implicit guarantees that the banks provided to the special purpose vehicles (SIVs, conduits, etc.) they had created outside their balance sheets to house and structure their securitised credits meant that the risks passed straight back onto their own balance sheets. In the end, because of the complex and obscure structure created by securitisation, no one knew where the risks were located. This resulted in a crisis of confidence which made it difficult for many banks to obtain funding. Although the description of the banks provided here is somewhat simplified to make it more intelligible, the basic principles behind the discussion on the inherent instability of banks still apply.

4 In 1656 Johan Palmstruch received a royal warrant to form Sweden's first bank, *Stockholms Banco*. One of Palmstruch's ideas was to issue a form of credit paper known as *kreditivsedlar*. These were interest-free promissory notes for specified amounts backed by metal coins deposited with the bank. The notes initially proved successful but when questions arose about the bank's ability to pay the specified value in coins this resulted in a run on the bank, which was forced to close. Palmstruch was ousted and sentenced to death but was later reprieved. *Stockholms Banco* was taken over by the Riksdag of the Estates, which formed *Riksens Ständers Bank*, later *Sveriges riksbank*, from the remnants of the bank. In 1668 *Riksens Ständers Bank* thus became the world's first central bank, although its activities did not start to resemble those of a modern central bank until shortly before the turn of the twentieth century.

dependent on the interbank and securities markets.[5] Investors in these markets are extremely sensitive to actual or feared negative changes in banks' creditworthiness. Because of this, they are liable to very quickly withdraw their funding by not renewing their lending to the banks. The securities markets thus constitute a highly volatile source of funding for the banks.

Problems in one bank can spread to other banks

The emergence of problems in an individual bank need not in itself constitute a major problem for society. What causes concern is rather that problems in one bank can spread like wildfire to other banks. This can happen in a variety of ways.

Firstly, problems can spread directly, through the exposures that banks have to each other in payment systems and in connection with trading in currencies and securities. These exposures can sometimes be significant, which means that the domino effects can also be significant if customers of an affected bank are denied access to their means of payment. This makes it difficult to make payments to other households and businesses, which in turn can lead to liquidity problems and eventually to credit losses and payment problems for these customers' banks.

On the other hand, banks are often exposed to the same types of risk, which increases the probability that a macroeconomic shock, for instance, will affect more than one bank. Such fears can cause the banks' lenders to become overly cautious about renewing their lending. A situation where problems spread from one bank to another can thus arise even as an indirect effect, because of expectations that other banks may be affected by similar problems as those affecting the bank that was hit first, or through more or less well-founded suspicions about banks' exposures to each other.

Financial problems in one bank can thus undermine confidence in an entire banking system. In the worst case, problems which initially affect only a small institution can evolve into a crisis of confidence affecting the rest of the financial system. In a domino-like manner, problems (or the mere suspicion of problems) which originally affect only one bank can lead to problems for the entire banking system. Risks that can have knock-on effects on the rest of the financial system are normally termed *systemic risks*.

[5] See, for example, the article "Financial stability – new challenges", *Financial Stability Report* 2007:2 (Sveriges Riksbank).

Systemic financial risks can have major repercussions on the real economy

A crisis affecting large parts of the financial system can also have significant consequences for the economy as a whole. How large this impact will be depends on which functions in the financial system are affected and to what extent. The payment system is a part of the infrastructure of society. If businesses and households are unable to make payments it will not be long before large parts of the economy are affected. Because of the large amounts that circulate daily through various transactions, an interruption of payments can very quickly have consequences that are hard to predict.

The supply of credit in the economy is another central function. Credit is a key factor enabling businesses in the real economy to operate. If a crisis results in sharply escalating financial expenses or a rapid contraction in the availability of credit this can also have significant consequences for the real economy, which in turn can further aggravate the situation in the financial sector.

A case in point is what happened when the current financial crisis escalated in early autumn 2008. As conditions in global financial markets deteriorated rapidly, premiums on credit risk increased across the board (see Figure 1 in Appendix). Premiums increased more for those borrowers that were deemed to be most risky than for others. Banks and other financial institutions in all regions started to reduce their exposures and leverage.[6] The sharp curtailment of lending exacerbated the downturn in the global economy. The decline in economic activity in turn added to the negative trend, resulting in sharply falling asset prices and growing credit losses for banks. A vicious circle arose in the global economy in which financial worries intensified the downturn in the real economy and vice versa.

The need for a public safety net

We have established that banking activities are associated with an inherent instability and that problems in one bank can easily spread to other parts of the financial system with potentially significant repercussions on the rest of society. A large portion of the costs incurred as a result of problems affecting an individual financial institution can thus affect not only the institution itself and its customers and lenders, but in the long run also other institutions and society at large. Although individual play-

6 However, there are currently no clear indications that Swedish banks cut back on their lending.

ers can have sufficiently strong motives to value and protect themselves against risks that can hit their own wallets directly, such incentives are not always sufficient to take full account of effects on third parties and society as a whole. As this type of external effect can be particularly significant in crises in the financial sector, the normal mechanisms of the market economy need to be supplemented with various public initiatives.

There is, in other words – and in an entirely different way than for most other forms of enterprise – a need for a public safety net for financial activities. This safety net normally has certain definite components. Firstly, there is an extensive body of regulations that financial companies are obliged to comply with. Secondly, financial companies are subject to special supervision. Thirdly, there is often a government insurance scheme covering depositors' assets in bank accounts, thus reducing the risk of bank runs. Fourthly, central banks have an array of tools for promoting stability in the financial system. In the next chapter we will take a closer look at the tools that are available to the Riksbank.

But before we address this issue, we need to mention that the safety net for financial activities does not have only positive effects on financial stability. One of the less desirable effects is that it can also encourage a less cautious approach to risk. Because the safety net makes the bank's lenders immune to certain risks in various ways, it can be tempting to let the bank take bigger risks than would be optimal from the point of view of the economy as a whole. Simply put, the safety net reduces the private cost of applying more risk-filled strategies. This is a well-known phenomenon that is generally termed *moral hazard*.

Moral hazard problems can be costly for society both directly in the form of excessive risk-taking in the economy and indirectly by undermining confidence in the financial system if the safety net is abused.

To reduce moral hazard problems, it is therefore important to ensure that public supervisory authorities and regulations take account of these. In particular, the terms on which guarantees and liquidity support are provided have a big impact on regulators' ability to counteract the problems and reduce the costs incurred. Designing a public safety net for financial activities thus always involves a series of difficult balancing acts.

It is important to stress that the safety net should not be designed so that no bank will ever be allowed to fail. Such a safety net would inhibit innovation and the development of the industry. In the longer term it can only lead to a less efficient banking sector. To avoid such rigidities, it should, for example, be possible to unwind the operations of a problem bank in an orderly manner and without jeopardising the stability of the financial system.

As we have established, the public safety net has many components. These in turn involve a number of different government agencies: The Financial Supervisory Authority (financial supervision and regulation), the Riksbank (various types of liquidity support, stability research and monitoring), the National Debt Office (deposit insurance schemes, guarantees and other support measures) and the Ministry of Finance (work on financial legislation and bank support packages that have an impact on the government budget). In the following we will describe that part of the safety net for which responsibility rests with the Riksbank.

The Riksbank's tools for promoting financial stability

As mentioned in the introduction, the Riksbank has two main tasks: to conduct monetary policy and to maintain financial stability. These two tasks are closely related. Without a stable financial system, it becomes more difficult to conduct effective monetary policy. And price stability is a part of a well-functioning payment system. However, the ways in which the Riksbank approaches its two main tasks of monetary policy and financial stability normally differ somewhat from each other. It could be said that in normal circumstances the Riksbank has two different toolboxes for performing these tasks.

The first is a monetary-policy toolbox. Monetary-policy measures, such as setting the target interest rate, have a clear objective: to influence economic activity with a view to maintaining price stability. This, in turn, is a key ingredient in the Riksbank's ambition to achieve stable growth in the real economy.[7]

Secondly, there is a toolbox for promoting stability in the financial system. For this purpose the Riksbank normally uses other tools than the target rate. We can distinguish between measures that the Riksbank takes in normal circumstances to reduce the risk of serious disruptions in the financial system and tools that can be employed to manage a crisis situation that has arisen.

For preventive purposes, the Riksbank performs analyses to identify vulnerabilities and risks in the financial system; the Financial Stability Report, which is published twice a year, has now been a key part of the Riksbank's stability work for over a decade and serves as an important basis for dialogue with banks and other financial market participants. For

[7] By deciding the terms for banks' borrowing and lending in the Riksbank, the Riksbank can influence the shortest market interest rate, known as the overnight rate, so that it ends up close to the repo rate, i.e. the Riksbank's target rate. The repo rate is thus the Riksbank's target for the overnight rate. This rate, i.e. the interest rate charged on loans between banks from one day to the next, in turn affects the interest rates available to the public, and thereby activity and price trends in the economy. The monetary policy mechanism can only operate effectively when the interbank market is functioning.

a number of years, the Riksbank has also worked on improving its preparedness for financial crises, notably by conducting crisis management exercises and by concluding agreements on crisis management partnerships with other government agencies, in Sweden and in neighbouring countries. The Riksbank also contributes actively to work on improving financial regulatory frameworks, in Sweden and globally. These "tools" were to a large extent developed in response to the crisis which arose in the Swedish banking system in the early 1990s. That crisis revealed several serious shortcomings, both in the banks and in the regulators' preparedness. At the time, there was not yet a developed culture for handling the risks created by the rapid expansion of lending that followed on the heels of the relaxation of credit regulations and pent-up borrowing needs in the 1980s. It was clear that government agencies such as the Financial Supervisory Authority, the Ministry of Finance and the Riksbank did not have a clear enough overview of the risks in the banking system to be able to predict the crisis that would occur. Nor had any of these bodies been given the task of adopting such a general perspective.

Better equipped to manage today's crisis

The conscious efforts that have been made to improve preparedness are probably one reason why the Swedish authorities have this time been better equipped to manage a crisis in the financial system than they were at the beginning of the 1990s. It is also likely that lessons from the 1990s crisis have led to certain insights and a greater awareness of the risks that exist in many financial sector participants. This in turn should have ensured that Swedish banks entered the current crisis from a better starting position than many banks in other parts of the world.

Despite this, it is clear that certain lessons were "forgotten" by many of the financial market players during the relatively benign period that lasted up until the present financial crisis. It could also be argued that some important legislative work, for instance on a special regulation for handling crisis-stricken banks, was pushed to the side for rather too long after the dust had settled from the 1990s banking crisis. The support bill that was rapidly introduced in October 2008 came into being only when the global financial crisis was holding the authorities by the throat. It is also clear that no authorities in any region foresaw the global scope and complexity of today's financial crisis (although the Riksbank was quick to warn about the unsustainably low credit risk premiums that existed during the period prior to the outbreak of the crisis). Previous financial crises have largely been home-grown affairs. The global extent of today's crisis

points to a need to further expand international cooperation on financial regulation, supervision and crisis management.

Hands-on tools in a financial crisis

The Riksbank, like other central banks, has long since had a range of more hands-on tools which it can employ in a financial crisis. In particular, it has various means for rapidly adding liquidity to the banking system. Central banks have – for several centuries – often had to assume the role of lender of last resort. The special nature of the current crisis has put a lot of pressure on central banks, including the Riksbank, to rapidly develop and adapt their measures to improve liquidity. We will return to this subject shortly.

When interbank markets have failed to operate normally and interest rates have to some extent been governed by a lack of confidence, this has reduced the potency of monetary policy. As a result, the Riksbank has had to use tools from both boxes during the crisis. The circumstances have required certain tools that we otherwise rarely need to use. Some tools we have had to reinvent and develop during the course of the journey. The measures taken have been aimed primarily at strengthening financial stability and at maintaining the functionality of financial markets to ensure that payment and credit systems can continue to operate. This is essential for ensuring that the economy as a whole can function.

Many of the measures taken to maintain financial stability also have indirect monetary-policy effects. Measures that help to restore confidence in markets, for instance, also help to push down interest rates and improve access to credit. This in turn increases the impact of monetary policy. Similarly, the Riksbank's interest rate cuts also help to restore financial stability by improving credit supply. In the present crisis, the Riksbank's normal monetary-policy measures and measures aimed at strengthening financial stability have thus complemented each other in a mutually reinforcing manner.

To gain some understanding of what we are doing today, we can look at the banks' lending rate, i.e. the rate charged to households and businesses. Simply put, it could be described as the Riksbank's target interest rate plus a premium. The size of the premium depends on the bank's demand for compensation for credit risks and liquidity risks, differences in maturities and the bank's capital adequacy requirements for the lending as well as other factors. What we are now doing is adjusting the *first* term, i.e. the target rate, while at the same time attempting to influence the *second* term, i.e. the risk premiums that have occasionally been reflected in wide credit spreads because of fears about financial stability.

The actions taken by the Riksbank and other central banks should be seen as complements to a whole range of other government initiatives, such as loan guarantees, capital injections and the purchase of under-performing assets, which have been implemented around the world. As mentioned, one of the purposes of this article is simply to describe the concrete measures that the Riksbank has taken during various phases of the crisis. Because of the, in this sense, narrow focus of the article on the measures taken by the Riksbank, many other government initiatives that may be significant per se are not dealt with here.[8],[9] Nor do we address the more fundamental causes of the crisis.[10] Before we take a more detailed look at the measures that the Riksbank has taken in response to the crisis, however, it may be a good idea to take an overall look at the course of events from a global perspective.

The current crisis: origins in the US home loans market

The first manifestations of the crisis appeared in the United States. In fact, the problems in the US mortgage market surfaced already in 2005 when US interest rates started to rise. As a result, many borrowers in the "sub-prime" segment, i.e. that portion of the mortgage market that is aimed at borrowers with poor credit histories, faced difficulties meeting their payment obligations. In 2007, these problems led to a gradual increase in the number of defaults among mortgage institutions operating in the subprime market. The subprime market was heading inexorably towards collapse.

For a long time, it was hoped that the problems would be limited to the subprime segment. But soon a number of events occurred which would dash those hopes. It began on June 7, 2007 when Bear Stearns & Co, a major investment bank, informed its investors that two of its hedge funds had sustained large losses on assets tied to subprime loans. Shortly thereafter the funds collapsed. On June 20, the investment bank Merrill Lynch took over assets worth $800 billion from Bear Stearns' funds.

In early July, Moody's cut its credit ratings on a whole range of securities with subprime content. Concerns about the quality of subprime loans mounted, and trading in a number of related credit risk instruments

8 Other government initiatives are discussed in the article "Global recession and financial stability", *Financial Stability Report* 2009:1 (Sveriges Riksbank).

9 See also Sellin, P., 2009, "The central banks' extraordinary measures during the financial crisis", *Economic Commentaries*, 2009:9 (Sveriges Riksbank).

10 See Ingves S. & J. Molin, 2009. "The Monetary Policy Landscape in a Financial Crisis", *The Economic Review*, 2009:2 (Sveriges Riksbank) for a discussion of more fundamental causes behind the current crisis, such as the global imbalances that were built up over a long period of time, failings in the risk behaviour of financial market participants and certain loopholes in financial regulations.

fell dramatically. Spreads between the prices quoted in the market and those arrived at using specially designed valuation models widened significantly. In many cases no prices at all were quoted in the market. This meant that the crisis was starting to have major international ramifications. Many banks in all corners of the world found it hard to renew their short-term loans in the market, and struggled to fund their operations. Swedish banks still remained relatively unscathed, however. Although they, too, now found it more difficult and expensive to obtain funding in the market than previously, their problems were not as great as those faced by many other banks around the world. Their strong balance sheets and earnings and their lack of significant exposures to instruments with suspected subprime content placed them on relatively stable ground.

The problems spread to Europe

In late July 2007, the German bank IKB announced that it had incurred big losses on its large exposures to the subprime market. A few weeks later, another German bank, Sachsen Landesbank, was hit.

At the beginning of August 2007, the shortest interbank rates shot up. The reason was that many banks with excess liquidity chose to deposit their money safely with the central bank rather than lend it out in the interbank market. On August 9, the French bank BNP Paribas temporarily closed three of its funds due to "the total lack of liquidity in the market". The same day, the European Central Bank (ECB) responded by offering loans to the banks at its official lending rate of four percent, i.e. with no extra premium. This increased liquidity in the European banking system by $95 billion.

The following day, a number of central banks, including the Bank of Japan, Bank of Canada, ECB and the Federal Reserve, implemented the biggest internationally-coordinated liquidity operation since the 2001 terrorist attacks. The Riksbank did not participate in the operation, as the liquidity situation for the Swedish banks at this time was not as difficult.

On 13 September 2007, the UK mortgage lender Northern rock announced that it faced acute funding problems and turned to the Bank of England with a request for emergency credit. In a very short space of time, Northern Rock, which had to a large degree funded its operations in the commercial paper and interbank markets, found itself facing a crisis of liquidity. When the bank's problems became known, depositors rushed to withdraw their savings and the share price plummeted. In response, the UK authorities announced further guarantees and raised the deposit guarantee.

In October and November, several large international banks announced that they had incurred significant impairment losses on their exposures to the subprime sector.

The crisis escalates

In the winter of 2007/08, the problems affecting subprime-related assets continued amid weak trading in the market for these assets. Serious concerns also arose about the monolines, a type of credit insurers specialising in bond insurance.

On 18 February 2008, after a series of failed negotiations with private investors on a takeover of the bank, Northern Rock passed into the ownership of the UK government.

In March 2008, rumours arose that Bear Stearns faced a liquidity squeeze. As a result, investors no longer wanted to lend money to the bank, creating an acute shortage of short-term funding for Bear Stearns. On March 14, the Federal Reserve issued a loan against collateral with the aim of stabilising the situation in Bear Stearns. The news led to a halving of the share price and prompted downgrades from the rating agencies. On March 16, the investment bank J.P. Morgan announced that it planned to buy Bear Stearns with help from the Federal Reserve. Following renegotiations of the offer over the Easter weekend, Bear Stearns' assets were transferred to a separate company set up by the Federal Reserve, in which J.P. Morgan assumed the risk for the first billion dollars of any loss. Under the agreement, the Federal Reserve guaranteed the rest, $29 billion.

On 11 July 2008 IndyMac Bank, a subsidiary of Independent National Mortgage Corporation, was placed in administration by the US Federal Deposit Insurance Corporation (FDIC).

The crisis reached a crescendo at one o'clock in the night before Monday, 15 September 2008 when Lehman Brothers Holdings announced that it intended to apply for Chapter 11 bankruptcy protection. The bankruptcy filing, coming from a major investment bank, sent shockwaves across the already hard-pressed financial markets, triggering a period of extreme volatility. Some commentators characterised this period as "the perfect storm". In this situation liquidity in a number of the banks' key short-term funding markets seized up, and the Swedish banks were drawn into the crisis in a serious way. The authorities now intensified their activities aimed at mitigating the impact on financial markets and the economy at large.

The Riksbank intervenes

The Riksbank raised its preparedness already in the summer of 2007 when the first signs of problems in international financial markets appeared. When the ECB increased the supply of liquidity in the interbank market in early August 2007, the Riksbank responded by expanding the range of data that banks are required to provide and stepped up its monitoring of the liquidity situation in the market. Shortly before Lehman Brothers' bankruptcy filing the central banks also intensified their collaboration on transactions in CLS, the international system for foreign exchange transactions.

However, after Lehman Brothers filed for bankruptcy on September 15 the situation in financial markets took a significant turn for the worse. At this time, the Riksbank was monitoring the liquidity situation in the banking system virtually on an hour-by-hour basis. In the ensuing period, the Riksbank took measures in various phases that were designed to strengthen the functionality of the financial market and the stability of the financial system in general. These measures fall broadly into three main categories: *general measures to improve liquidity, liquidity support to individual institutions* and *loan facilities for neighbouring countries.*

General liquidity measures alleviate the situation in the interbank market

The Riksbank's counterparties have long been able to obtain overnight credit in Swedish kronor in the RIX payment system against certain types of pre-approved collateral at the repo rate plus a premium of 0.75 percentage points. There is also a corresponding facility enabling banks to deposit money overnight in RIX accounts paying the repo rate minus 0.75 percentage points.[11] As the Swedish interbank market, unlike those of many other countries, actually continued to function for the very shortest maturities, it has so far not proved necessary to use this facility. On the other hand, Swedish banks have found it hard to borrow at longer maturities since the autumn of 2008. This, in turn, has created a certain slack that is also reflected at the short end of the money market, putting pressure on short-term rates.

To make it easier for the banks to obtain short-term funding and trade in the interbank market, the Riksbank has on a number of occasions during the crisis created new and supplementary loan facilities. As a

[11] In July 2009, this interest rate corridor, as it is known, was reduced from plus/minus 0.75 percentage points to plus/minus 0.5 percentage points. With the repo rate currently standing at 0.25 per cent, this means that a bank which deposits money overnight in RIX will receive a negative interest rate.

preventive measure, these facilities have since been made available on a more regular basis in order to reduce the risk of even more serious problems arising in the banking system. However, the subsequent course of events has made it necessary to modify some of the terms for the facilities. The Riksbank's general measures aimed at improving liquidity in the banking system can be divided into the following categories:

- a facility to borrow Swedish kronor at longer maturities than normal (3, 6 and 12 months)
- a facility for short-term loans in foreign currency (US dollars)
- an expansion of the list of types of collateral that are accepted in RIX
- an expansion of the group of counterparties that can borrow from the Riksbank

In connection with Lehman Brothers' bankruptcy filing, the liquidity of mortgage bonds plummeted around the world. This made it difficult for banks to trade their mortgage paper. On 18 September 2008, the Swedish National Debt Office announced that it had decided, after consulting the Riksbank, to issue a large volume of short-term treasury bills. The money raised through the extra auctions was lent in the form of reverse repos backed by mortgage paper.

On September 22, the Riksbank decided, for the same reason, to raise the permissible share of covered bonds from related institutions that banks could use as collateral for loans in the Riksbank's payment system, RIX. The share was raised from 25 per cent to 75 per cent. The expanded loan facility in RIX improved the banks' liquidity situation. A few weeks later, on October 8, the restriction on the share of covered bonds from related institutions was removed completely. This brought the Riksbank's rules more in line with those of other central banks. At the same time, the Riksbank also decided to lower its minimum credit rating requirement for securities with longer maturities that are posted as collateral.

Lehman Brothers' bankruptcy filing also led to a run on a number of large US money market funds. As these funds had accounted for a majority of US dollar loans to European banks, the upshot was an acute global shortage of US dollars. On September 24, the Riksbank announced that it together with several other central banks had instituted temporary, reciprocal currency arrangements (swap facilities) with the Federal Reserve for the purpose of managing the stressed situation in the markets for short-term dollar borrowing. On September 29, the Riksbank also announced a new US dollar loan facility.

On October 2, the Riksbank opened a new Swedish kronor loan facility. The purpose was to improve access to credit at longer maturities.

An initial auction of SEK 60 billion for secured three-month loans was planned for October 6. However, the same day the Riksbank stated that it had decided to increase the amount to SEK 100 billion. The auction was oversubscribed. On October 8, a further auction for SEK 100 billion at maturities of six months was announced.

The introduction of these new loan facilities marked the start of a long series of frequently-recurring auctions during the autumn, spring and summer. In these auctions the Riksbank has offered its counterparties loans in kronor as well as dollars. On October 24, to improve predictability, the Riksbank announced a programme of auctions for three-month Swedish kronor loans at approximately two-week intervals starting on November 10. At the same time it was announced that the exact terms for each auction would be published at least two days before the auction date and that the amounts would be fixed based on market conditions and the outcome of previous auctions.

On October 29, the Riksbank introduced one further credit facility in which banks could post commercial paper with maturities of up to one year as collateral. The purpose of the new credit facility was to improve the supply of credit to non-financial enterprises. The first of the credits under this new facility, SEK 40 billion in three-month loans, was offered in an auction on November 5, but only SEK 4.5 billion was taken up by the banks. This facility, too, was offered at two-week intervals. However, the banks have not made extensive use of these facilities.

In May 2009, the Riksbank also started offering twelve-month loans in Swedish kronor against collateral.

Since the autumn of 2008 and until today (September 1, 2009), the Riksbank has offered secured loans (including commercial paper) with various maturities worth a total of SEK 2,440 billion through auctions. Of this, about 30 per cent, or SEK 735 billion, has been taken up by the banks. Although the banks have not made full use of their opportunities to borrow from the Riksbank, it is highly likely that the awareness that such opportunities exist has help to alleviate the situation in the interbank market.

GREATER INTEREST IN DOLLAR LOANS

On the other hand, the banks showed very strong interest in the dollar loans. Why this was so was difficult to say, as we did not know how large a portion of the loans the banks have used to actually pay down dollar debts and how large a portion has been swapped for Swedish kronor. Recently, interest in the dollar auctions has cooled, however. In these auctions the Riksbank has offered some USD 130 billion, of which about 75

per cent has been taken up by the banks. To enable lending in US dollars, the Riksbank has used its swap agreements with the Federal Reserve, under which Swedish kronor are exchanged for dollars, as well as parts of its foreign exchange reserves.

In late May 2009, the Executive Board of the Riksbank decided to strengthen its foreign currency reserve by borrowing the equivalent of SEK 100 billion. This was considered necessary partly because the Riksbank had lent a part of its foreign exchange reserves to Swedish banks, and partly because it had increased its commitments to other central banks and international organisations. The Executive Board deemed it important that the Riksbank should remain prepared to provide the Swedish banks with the foreign currency liquidity they required.

At present (1 September 2009) the Riksbank has outstanding loans to the banks of about SEK 300 billion and about USD 8 billion.

LENDING TERMS NEED TO BE ADJUSTED

In the intervening period various changes have been made to the terms for the various loan facilities. Originally, the Swedish kronor loans were offered at fixed interest rates (the repo rate plus a premium). However, on 13 February 2009 the Riksbank stated that it intended to offer variable-rate loans in order to ensure that speculation about future interest rate cuts would not lead the banks to wait for too long before deciding to borrow. When the repo rate was set at an unprecedentedly low 0.25 per cent on 2 July 2009 the Riksbank once again offered to lend money at essentially fixed interest rates. This time it offered SEK 100 billion in one-year loans. The minimum interest rate was set at the repo rate plus a premium of at least 0.15 percentage points.[12] The loan had an expressly monetary-policy purpose.

To attract the excess liquidity that temporarily arises in the banking system due to the expansion of its loan facilities, the Riksbank has also on a number of occasions, starting on 14 October 2008, issued Riksbank certificates with maturities of one week. These have served as a complement to the Riksbank's existing fine-tuning operations. However, the banks have to a large extent chosen to invest their excess, at lower interest rates, in liquid deposit accounts with the Riksbank, i.e. in the fine-tuning facilities.

On 3 April 2009, the number of counterparties able to access the Riksbank's temporary credit facilities was expanded. This was achieved by

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[12] Bidding in the auctions covers volumes as well as interest rate terms. The auction was oversubscribed and the outcome resulted in a final premium of 0.20 percentage points.

giving other financial institutions than the Riksbank's ordinary counterparties the opportunity to become "limited counterparties".

As the reader will be aware, the repo rate itself has been adjusted several times during the period. Although this is primarily a monetary-policy measure aimed at influencing economic activity and maintaining price stability, the measure has also indirectly helped to improve the functioning of the financial market. This is an example of how monetary-policy measures and measures to improve financial stability have complemented each other in the crisis.

The Riksbank's balance sheet has trebled

As a result of the measures described above, the Riksbank expanded its lending to banks by over SEK 450 billion in the second half of 2008. The increased lending expanded the Riksbank's balance sheet from about SEK 200 billion to about SEK 700 billion in the second half of 2008, i.e. by more than three times. To get a better idea of what all this lending meant for the Riksbank, it may be interesting to look at the bank's balance sheet before and after the Lehman Brothers bankruptcy. The Appendix shows the Riksbank's balance sheet at 30 June 2008 (Table 1) and at 31 December 2008 (Table 2).

Comparing the two balance sheets, we see that the bank's lending in Swedish kronor increased by about SEK 260 billion during the period. On the liability side this was reflected in an increase in the Riksbank's fine-tuning facility, where banks can invest their excess liquidity overnight, and in the increase in one-week Riksbank certificates. The banks thus increased their reserves at the Riksbank.

The Riksbank also issued US dollar loans worth almost SEK 200 billion. As mentioned, these loans were funded using the bank's foreign exchange reserves and through a swap agreement with the Federal Reserve. The apparent increase in the foreign exchange reserve during the period is mainly due to foreign exchange reserves.

The "Other" item on the liability side includes the Riksbank's earnings and valuation accounts. The increase in this item is primarily due to exchange rate effects but also to the fact that the Riksbank made a certain profit from the transactions.

The balance sheets of other central banks also expanded sharply as a result of increased lending during this period (see figure 5 in the Appendix).

Liquidity support to individual institutions as a means of alleviating concerns

Chapter 6, Section 8 of the Sveriges Riksbank Act gives the Riksbank the opportunity to offer credit or guarantees to banks on special terms for the purpose of providing liquidity support. Such targeted liquidity support can be employed, for instance, when problems in one institution risk causing knock-on effects on other parts of the financial system.

In autumn 2008, financial markets were in turmoil. In the volatile situation that existed it was deemed that even if a small number of institutions were allowed to fail the risk of widespread contagion would be significant. Because of this, two institutions, Kaupthing Bank Sverige and Carnegie Investment Bank, which under normal circumstances would have been unlikely to qualify, were given emergency liquidity support from the Riksbank. It eventually proved possible to sell the two problem banks to private investors, and the liquidity support incurred no losses for the State.

KAUPTHING BANK SVERIGE

The Icelandic banking sector had been under heavy pressure from an early stage of the crisis. In the autumn, conditions in the Icelandic banking sector deteriorated significantly, and in October 2008 Kaupthing Bank Sverige (AB) (KBS), a Swedish subsidiary of Kaupthing Bank of Iceland, was struggling to meet its payment obligations. On 8 October 2008, the Riksbank therefore decided to provide emergency liquidity support to KBS in the form of a five billion kronor credit line. The loan was provided against collateral on a provisional basis. Under the agreement, the loan could be used to pay depositors with accounts at Kaupthing's Swedish branch (Kaupthing Edge) as well as depositors and other creditors in Kaupthing's Swedish subsidiary, KBS. In connection with the provision of the credit facility, the Riksbank and the Swedish Financial Supervisory Authority both made the assessment that KBS was solid. The day before, the Icelandic central bank had also provided a €500 million liquidity support facility to KBS' Icelandic parent.

In a press release the Riksbank explained its reasons for the decision: "In the situation that has arisen there is an imminent risk that the bank will face liquidity problems. To maintain financial stability in Sweden and ensure the functionality of financial markets, the Riksbank has therefore decided to provide liquidity support to Kaupthing Bank Sverige AB. The Riksbank is prepared to provide the liquidity that is required."

On 27 March 2009, Ålandsbanken bought Kaupthing Bank Sverige AB. As a result, all of the liquidity support provided was paid back to the Riksbank.

CARNEGIE INVESTMENT BANK

A few weeks after KBS had received liquidity support, Carnegie Investment Bank AB (Carnegie) also faced liquidity problems. Carnegie operated mainly in the areas of stockbrokerage, equity research, equity trading, asset management and M&A advisory services, and was a major player in the Nordic securities markets. The key reason behind Carnegie's liquidity problems was the increasing demand for collateral in the wake of the financial crisis.

On 27 October 2008, the Riksbank decided to provide a one billion kronor emergency liquidity support facility to Carnegie Investment Bank AB. The following day the credit limit was increased to five billion kronor. The action was taken preventively as a means of enabling Carnegie to release its own liquidity should the need arise.

The decision to provide liquidity support was taken to reduce the risk of a serious disruption in the financial system in view of the turbulent conditions that prevailed at the time. The Riksbank and the Financial Supervisory Authority both took the view that Carnegie was solid but that the ongoing financial crisis had created liquidity problems for the bank. The loan was provided against collateral on a provisional basis.

However, the Financial Supervisory Authority had pointed to serious failures in Carnegie's risk management. The problems affecting Carnegie's management and ownership structure also ran deep. On November 10, after the expiry of the period of grace that the bank's board of directors had been given to rectify the situation, the Financial Supervisory Authority revoked Carnegie's license to conduct banking operations. Simultaneously, the National Debt Office granted Carnegie a loan of up to five billion kronor to replace the emergency liquidity support facility previously granted by the Riksbank. This was done after the National Debt Office and the Riksbank had agreed that the former would take over the Riksbank's loan to Carnegie. Based on the bank support legislation that had recently been introduced, which assigned a special role to the National Debt Office in the provision of government support, it was deemed appropriate that the National Debt Office should assume responsibility for the support to Carnegie. In connection with this, the National Debt Office also assumed ownership of Carnegie Investment Bank AB, which thus recovered its banking license.

On 11 February 2009, the National Debt Office sold Carnegie Investment Bank and its subsidiary, Max Matthiessen Holding AB, to Altor Fund III and Bure Equity AB.

Swap agreement to alleviate the situation in Sweden's neighbours

The four largest Swedish banking groups have total assets of SEK 11,500 billion and a combined loan portfolio of about SEK 7,100 billion (second quarter of 2009). By comparison, Sweden's gross national product (GDP) in 2008 was about SEK 3,160 billion. About half of the banking groups' loan portfolios refer to foreign loans, mainly to borrowers in the other Nordic countries. About six per cent of the total volume, roughly SEK 440 billion, refers to the three Baltic countries – Estonia, Latvia and Lithuania. The Swedish banks' market shares are 82 per cent in Estonia, 55 per cent in Latvia and 63 per cent in Lithuania (second quarter of 2009).

The Baltic countries have been among those hardest hit by the current crisis, suffering precipitous falls in GDP and employment. In the second quarter of 2008, about half of the Swedish banking groups' credit losses stemmed from the Baltic countries. Because of the Swedish banks' not insignificant exposure to credit risk in the region, the continued economic performance of the Baltic countries impinges on the stability of the Swedish financial system.

To counteract any fallout in the Swedish financial system, the Riksbank has entered into swap agreements with the central banks in two of our Baltic neighbours. The swap agreement that the Riksbank, together with Danmarks Nationalbank, concluded with the central bank of Latvia, Latvijas Banka, on 16 December 2008 is one such agreement. It allows the Latvian central bank to borrow up to €500 million in exchange for Latvian lats. The Riksbank's share of the loan is about €375 million. On 27 February 2009, the Riksbank also signed a swap agreement with the central bank of Estonia allowing it to borrow up to ten billion Swedish kronor in exchange for Estonian kroons. The agreements are designed to provide short-term funding as a means of maintaining macroeconomic and financial stability in the two countries.[13]

[13] Earlier, on 16 May 2008, the Riksbank had together with the central banks of Norway and Denmark concluded a swap agreement with the central bank of Iceland, Seðlabanki Íslands, allowing it to exchange Icelandic krónur for euro. The Riksbank's swap agreement with Seðlabanki Íslands had a limit of €500 million. It could be argued, however, that this agreement had a somewhat different character than the agreements concluded with Estonia and Latvia, as the situation in Iceland was not as significant for the stability of the Swedish financial system.

The central banks' actions have been effective but the situation has yet to normalise

The most acute phase of the liquidity crisis now appears to be over and conditions in the global interbank markets have eased somewhat, with banks resuming some of their lending to each other. However, this is largely due to the fact that central banks have stated that they are willing to continue lending to the banks to the extent required.

Another difference is that the rates at which banks lend to each other have fallen sharply. Figures 2-4 in the Appendix shows Ted[14] and Basis[15] spreads for the United States, the euro area and Sweden. Both spreads have fallen to roughly the levels that prevailed before the collapse of Lehman Brothers in September 2008 and are currently (1 September 2009) about 30 basis points in the US and 40 basis points in the euro area and Sweden. Although the levels are well below the spikes of autumn 2008, they are still high compared with the period before the outbreak of the crisis in 2007. A strong contributing factor behind the fall in interbank rates is that central banks worldwide have cut their policy rates to very low levels. Since December 2008, the Riksbank has lowered its repo rate from 3.75 per cent to 0.25 per cent.

For maturities over one month the money market is still operating less well than normal. Many banks are still choosing to hold excess liquidity on their own balance sheets. This means that transactions involving longer maturities are small and irregular. Banks and investors around the world are thus still reluctant to lend, and the funding problems that arose in 2008 are still present in many places. This confirms the impression that it is the actions taken by central banks that are keeping the interbank markets afloat. As long as concerns about actual counterparty risk persist central banks will remain the most important source of funding.

The liquidity in Swedish kronor and US dollars that the Riksbank has provided since 2008 through its recurring auctions has helped to ease conditions in the Swedish interbank market somewhat. Yet this is true mainly of short maturities, where turnover is satisfactory, though still below the levels existing before the crisis hit Sweden in earnest in September 2008. Although the auctions have not been fully subscribed, they provide security in the sense that the participants know that liquidity is available if it is required.

[14] Ted spread = the difference between the interest rates on three-month interbank loans and treasury bills with the same maturity.
[15] The difference between the three-month interbank rate and the expected policy rate.

The measures are still needed

The Riksbank, like other central banks, has taken a range of measures to improve liquidity in the interbank markets and restore stability to the financial system. The special nature of the crisis has put central banks under a lot of pressure to develop and adjust these measures in a short space of time. The wide variety of measures testifies to the shifting requirements created by various phases of the crisis.

The situation has not yet fully normalised, and the measures taken by the Riksbank and other government agencies are still needed to ensure that the markets are able to operate.

Since the most acute phase of the crisis, the demand for liquidity from the central banks has fallen in many places. This does not mean that the facilities no longer have a role to play. The fact that central banks the world over, including the Riksbank, have declared themselves willing to lend to banks to the extent required is a key reason why the banks now dare to lend to each other to some extent.

The situation in the Baltic countries still hangs as a cloud over the stability of the Swedish financial system, although the Swedish banks are currently deemed to be able to withstand a large amount of stress. If the situation were to take a dramatic turn for the worse the Riksbank is prepared to take the necessary measures.

Appendix

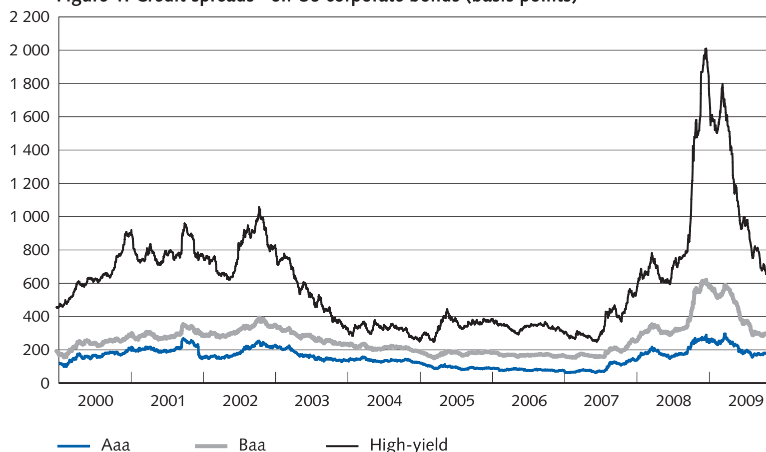
TABLE 1. THE RIKSBANK'S BALANCE SHEET AT 30 JUNE 2008 (SEK BILLION)

Assets		Liabilities	
Gold	26	Banknotes and coins	108
FX reserve	158	Fine-tuning	0
USD lending	0	Riksbank certificates	0
SEK lending	4	Liabilities to Fed	0
Other	4	Equity	59
		Other	25
TOTAL	192	TOTAL	192

TABLE 2. THE RIKSBANK'S BALANCE SHEET AT 31 DECEMBER 2008 (SEK BILLION)

Assets		Liabilities	
Gold	30	Banknotes and coins	112
FX reserve	200	Fine-tuning	207
USD lending	196	Riksbank certificates	49
SEK lending	262	Liabilities to Fed	189
Other	7	Equity	59
		Other	84
TOTAL	700	TOTAL	700

Figure 1. Credit spreads* on US corporate bonds (basis points)



*The difference in yields between corporate bonds and government bonds.
Source: Reuters Ecowin

Figures 2–4. The *Ted spread* (the three-month interbank rate less the interest rate on a three-month treasury bill) and *Basis spread* (the three-month interbank rate less the expected O/N rate for the same period) (basis points)

Figure 2. USA

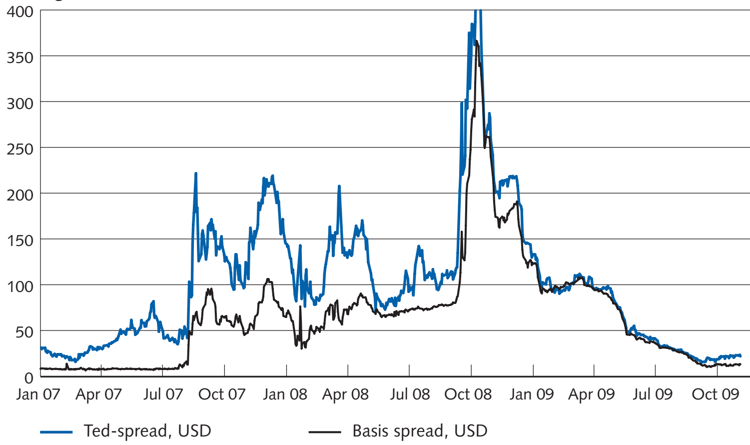


Figure 3. Euro area

Figure 4. Sweden

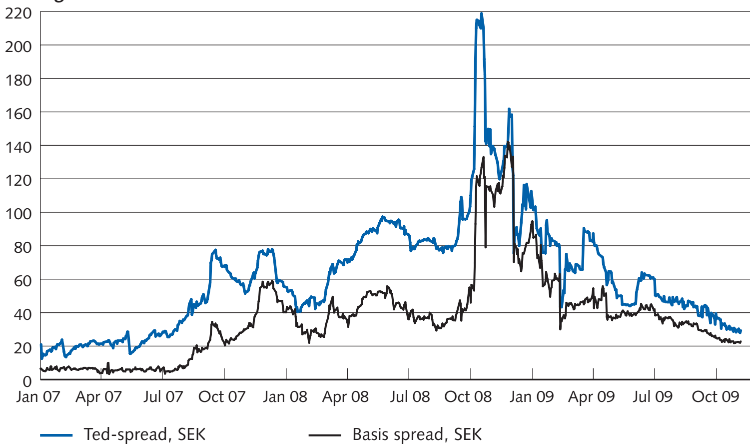
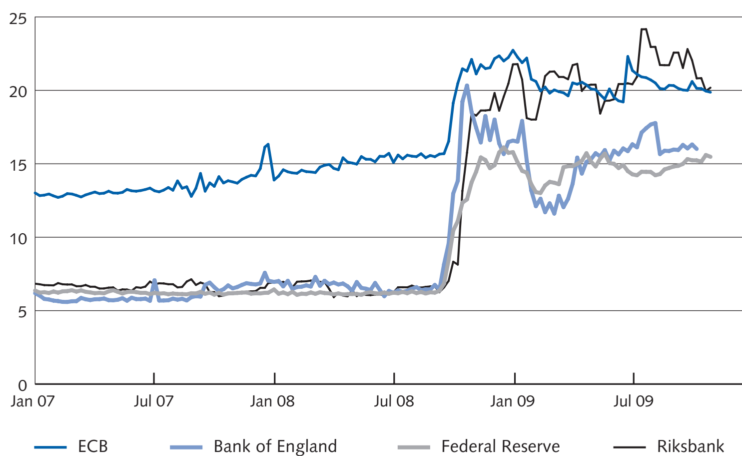


Figure 5. Central bank balance sheets, (percentage of GDP)



Sources: Bureau of Economic Analysis, Eurostat, Office for National Statistics, Statistics Sweden and the respective central banks.

Peter Englund, Professor, Stockholm School of Economics, comments on the paper by Johan Molin:

How has the Riksbank managed the financial crisis?

A central bank's most basic task is to guarantee the stability of the financial system. Traditionally, financial stability has primarily been associated with the payment system. By making it possible for solvent banks to borrow funds at the Riksbank, temporary shortages of liquidity in individual banks can be prevented from affecting the ability of these banks (and, ultimately, the entire banking system) to execute payments. Normally, the banks primarily manage their liquidity through mutual transactions on the interbank market. In this way, temporary surpluses and deficits can be evened out between different banks, while deficits in the banking system as a whole are eliminated by the raising of loans at the Riksbank. As such loans are normally more expensive than borrowing on the interbank market, the banks only turn to the Riksbank when all other options have been exhausted: the Riksbank is a "lender of last resort".

This traditional view of financial stability has now been widened in the direction Johan Molin discusses in the introductory part of his article. This is an issue not only of guaranteeing the payment system in the narrow sense, but also of the financial system's ability to manage risks and channel resources from savers to investors. The explosion of risk premiums and the drainage of liquidity occurring across all markets in September 2008 indicated that financial stability, in this sense, was under serious threat. It rapidly became much more expensive or, in certain cases, impossible for companies to obtain funding on the securities markets, while, not least importantly, the banks themselves were affected by the same problems as normal companies. This increased distrust of the system as a whole also led the banks to be less and less inclined to lend money to each other, particularly for longer periods of time. It rapidly became much harder to raise loans, even for Swedish banks – which were initially well capitalised and were not reporting any major loan losses. Interbank borrowing, to the extent that it was possible at all, underwent a shift towards shorter and shorter maturities. The central stability problem in the banking system – that long-term lending was funded by short-term borrowing – became accentuated.

Under these circumstances, the provision of overnight loans by central banks was not sufficient to secure the banks' acute liquidity require-

ments. The main factor lacking was access to funding over the slightly longer term. Across the world, measures were adopted that would turn the central banks into "lenders of first resort". While, under normal circumstances, banks' borrowing from central banks is entirely marginal, the Swedish banks' loans at the Riksbank amounted to approximately SEK 450 billion by the end of 2008, an amount equivalent to approximately one-quarter of their borrowing from the public. These loans had maturities of up to twelve months, longer than those normally granted by the Riksbank. Nevertheless, the effect was a significant reduction of the banks' funding. During the period from 2004 until the end of the first six-month period of 2008, half of the Swedish banks' borrowing had been long-term, with maturities exceeding one year, but, during the last six months of 2008 and the first six months of 2009, this only amounted to 15 per cent.[1] In practice, Riksbank loans with maturities of a few months came to replace borrowings of several years on the market. Interestingly enough, at the same time, almost half of this amount was returned to the Riksbank in the form of overnight deposits (the 'fine-tuning' item). Instead of relying on a poorly-functioning interbank market, the banks have built up large liquidity reserves in accounts at the Riksbank, funded by borrowing there.

Johan Molin's article presents the various measures implemented by the Riksbank, and the background to them, in a clear and instructive manner. However, he is cautious when it comes to assessing their effectiveness. There can certainly be no doubt that stability was seriously threatened and that the measures package as a whole – together with equivalent measures in other countries – contributed towards the restoration of an adequately functioning financial system. It is harder to assess whether these measures were correctly balanced. Were they the right kind of measures? Was their scope appropriate? Which criteria should be used to measure success when making such an assessment?

On the whole, the Riksbank's measures have not been directed towards individual institutions but towards supporting declining loan markets and offering borrowing from the Riksbank as a substitute for non-functioning markets. This primarily means the interbank market, above all for somewhat longer maturities, but it also applies to markets with more direct links to households and companies, such as the markets for mortgage and corporate bonds. In all of these markets, interest rate margins had skyrocketed in comparison with safe government securities.

However, apart from the various forms of general liquidity support, the Riksbank has also provided directed loans ('emergency liquidity

[1] According to information from Blomberg (2009).

assistance') to save two individual banks, Kaupthing Bank Sverige AB and Carnegie Investment Bank AB. In a crisis situation, financial stability tends to become equivalent to stability for the more important financial institutions. Very major banks are normally considered to have such great significance for the financial system that it seems impossible to gain an overview of the consequences of their failure. Regardless of the formal rules and regulations, they are "too big to fail". When a crisis is general, increasing numbers of banks tend to be placed in this category. There are several reasons for this. Firstly, in times of crisis, major banks are more vulnerable than normal to direct losses as a consequence of counterparty risks etc. Under such circumstances, even the insolvency of a minor bank can shake the entire system. Secondly, information becomes harder to interpret. Consequently, even the insolvency of a minor bank gives out signals which, fairly or unfairly, can be interpreted as indicating general problems also affecting other, larger banks. Thirdly, liquidity on the inter-bank market can be impacted negatively even by the failure of minor banks. It is difficult for outsiders to assess the effects the bankruptcy of Kaupthing or Carnegie would have had, and it is certainly understandable that the Riksbank was unwilling to test this in practice by simply letting them go under. However, at the same time, it must be pointed out that the provision of loans to these banks signalled that many banks are systemically important during a crisis.

Comparisons with other countries form a natural starting point for an assessment. An initial observation is that, taken in proportion, the Swedish measures seem unusually comprehensive, at least measured on the basis of the Riksbank's balance sheet. As can be seen in Figure 5 in the article, before the crisis, central bank balance sheets were equivalent to approximately 6 per cent of GDP in Sweden, the United States and the United Kingdom, while, by the spring of 2009, this figure had increased to 22 per cent in Sweden, compared with 13 and 12 per cent in the United States and United Kingdom respectively. Without knowing exactly what is behind these different figures, it still seems remarkable that the reaction – measured in this manner – should have been so much stronger in a small country far from the epicentre of the crisis than in the two countries where the whole matter began.

Another important difference from the rest of the world is that the Swedish measures have essentially been directed towards the banks, consisting of new loan facilities for them. The banks have thus been offered loans with longer maturities and against a greater range of collateral than normal, as well as loans in foreign currency. Furthermore, the Riksbank has expanded the group of financial institutions allowed to borrow to embrace those who are not counterparties in the payment system RIX.

On the other hand, the Riksbank has not conducted any direct operations on exposed financial markets – such as the markets for mortgage bonds – in a manner similar to those undertaken by their equivalents in several other countries. These markets have only been indirectly supported through the acceptance of such bonds as collateral for borrowing from the Riksbank. The intention has been to stimulate the banks to invest in commercial paper and similar instruments for subsequent use as collateral for borrowing from the Riksbank.

How can we assess whether the Riksbank's measures have been correctly balanced? We must first ask how far the Riksbank's responsibility for financial stability stretches. The inclusion of the payment system is uncontroversial. However, it is less obvious that various securities markets, for example the market for mortgage bonds, are also included. Are there markets that are "too important to fail"? Three lines of argument can be taken here (and they are not necessarily mutually exclusive). Firstly, if high interest rate margins and insufficient liquidity in various markets are due to stability problems in the banking sector – and these problems are of such an order as to threaten the stability of the payment system – it may then be justifiable to take direct action to restore the normal functioning of these problem markets while waiting for the banking system to stabilise. Secondly, if the problems in the banking system are due to problems on another market, it may be justifiable to take direct action on this market. This has evidently been applicable in the United States during the current crisis, but hardly in Sweden. Thirdly, if problems on certain markets are impacting the efficiency of monetary policy – for example, by severing the link connecting the policy rate with mortgage rates and other market interest rates – the precision of monetary policy can be heightened by an improvement of the functioning of the markets in question. As I see it, it is primarily the first and, to a certain degree, the third arguments that are of significance to Swedish policy. The fact that the crisis in the United States originated in the market for mortgage securities of various kinds explains the direct action taken by that country's government on these markets, alongside measures aimed directly at the banking system. The difference between Sweden and the United States and United Kingdom in this regard can thereby reasonably be explained by differences in the mechanisms of the crisis.

How can we tell whether the measures have been successful? On a superficial level, this question has a simple answer. As we can see, the banking system has survived and the payment system does not appear to be threatened. The banks appear to be solid and attractive enough to investors to bring in new capital in the form of new investments. All markets are also functioning better than they were a year ago. Interest rate

margins have fallen and liquidity has improved. The interbank markets are also functioning slightly better. However, the Ted spread, a measurement of the interest rate margin between interbank loans and treasury bills, remains at a relatively high level in Sweden, unlike in the United States. The Riksbank's measures seem to have been effective, even if they have not been enough to fully restore the banks' confidence in one another. One explanation for this is that the risk of major loan losses in the Baltic remains, and may even have increased.

Another indicator is lending by the banks. In addition to payment services, providing households and trade and industry with credit is, of course, one of the banks' main tasks. How well they are coping with this task is not easy to assess. Lending to households has continued to increase, albeit at a slightly lower rate than previously, while corporate lending started to decrease during the spring of 2009. However, whether this has been driven by a diminished supply from the banks or by declining demand is difficult to assess. A study conducted within the Riksbank (Ekici et al., 2009) draws the conclusion that "at present, there is nothing to indicate that Swedish companies and households are facing a serious credit restriction".

All in all, the Riksbank's measures – in combination with other government measures – have thereby contributed to the revitalisation of the Swedish banking system's capacity to fulfil its fundamental tasks. The policy has thus clearly demonstrated its advantages. But what are its costs? An answer to this question may initially be attempted from a public finance perspective. The Riksbank has lent large amounts against collateral which has evidently been deemed to be doubtful by the banks, and for an interest rate below the applicable market rate. In addition, half of this loaned amount has been returned as deposits with a favourable interest rate margin for the Riksbank. Calculated in this manner, the policy will probably not have any costs ex post. Unless a new banking crisis is lurking around the corner, the effect on the Riksbank's profit and loss account will, in all certainty, be positive. But this is, of course, an excessively simplistic view of the matter.

The real cost will instead be found in the signals sent to our banks by these crisis management measures. As we know, one of the main causes of the crisis was that the banks took excessive risks. Not least, they increasingly relied upon obtaining funding on a liquid and efficient short-term loan market. As this market has dried up, the banks' capital base has been insufficient to guarantee their stability. Now, at the same time as the Riksbank is instead stepping in to offer equivalent loans, the banks are being told that they will not need to attach such great significance to the liquidity risks on the short-term loan market in the future

either. This acute crisis management cannot be regarded in isolation but actually forms part of a system. If the Riksbank considers its task, in times of crisis, to consist of offering not only overnight loans but also loans for considerably longer maturities, it will simultaneously be inviting the banks to continue to ignore the liquidity risks inherent in short-term borrowing. Such a scenario would reinforce the need to regulate the banks' funding in another manner.

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