

What can a central bank do when the banks stop lending money to each other, the companies find it difficult to issue securities to fund their operations and the central bank's policy rate is so close to zero that it is not possible to reduce it any more to stimulate the economy? These are some of the problems that the central banks have faced during the course of the current financial crisis. They are also the issues addressed in this Economic Commentary.

The central banks' extraordinary measures during the financial crisis

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Over the last 12 months, disruptions on the financial markets have threatened financial stability and made it difficult to conduct monetary policy in several countries.¹ The central banks have countered this development by taking extraordinary measures with the aim of maintaining financial stability and making it easier for companies and households to get loans.

In this Economic Commentary, we discuss the problems that the central banks have faced during the current financial crisis and describe the measures that have been taken. The central banks have primarily attempted to make it easier for the banks to lend money, as well as to improve liquidity on certain financial markets. However, the economic downturn that followed in the wake of the crisis has led to a situation in which policy rates in several countries have been reduced to almost zero, leaving no scope for further cuts. This has meant that the central banks have had to take other measures to reduce the interest rates on loans to companies and households.

What problems have arisen in the wake of the crisis?

The financial crisis has led to a number of problems:

- The banks have become unwilling to assume counterparty risk by lending money without collateral to other banks, especially at longer maturities. Banks that have surplus liquidity now prefer instead to deposit this money at the central bank even though the interest rate on such deposits may be lower.
- The problems on the interbank market have made it difficult for some central banks to control the overnight rate.
- The lack of funding in US dollars has been a problem even for financial institutions outside the USA. Money market funds, which have previously been a source of USD funding, have not been able to play this role to the same extent as the interest of investors in these funds has declined.²
- Distrust between the banks has grown to such a level that this can become a problem for those banks that do not have a counterparty agreement with the central bank, as only a limited number of banks can borrow directly from the central bank.
- When an increasing number of banks choose to borrow from the central bank instead of on the interbank market, a shortage of creditworthy securities may arise as the central bank only provides credit against such collateral.
- It has become more difficult for financial companies to issue certificates as investors have preferred to invest in safe government securities.
- The major economic downturn, which is partly a result of the financial crisis, has led to a situation in which the policy rates in several countries have approached zero.

¹ For more detailed reviews of the financial crisis, see Fender and Gyntelberg (2008) and Brunnermeier (2009).

² See Baba et al (2009) and McGuire and von Peter (2009).

This has made it more difficult for the central banks to conduct a sufficiently expansionary monetary policy.

- Some of the banks that are experiencing problems are so important to the payment system that their bankruptcy could have consequences for financial stability.

These problems have led a number of central banks to take a range of extraordinary measures. However, before we study the measures that have been taken, it is important to understand how monetary policy works in practice under normal conditions.

How can a central bank control interest rates?

Most central banks try to control the so-called overnight rate, that is the interest rate at which the banks lend to each other overnight in order to even out any temporary surpluses or deficits in their accounts with the central bank.³ These imbalances arise every day as result of the transactions that the banks' customers carry out during the course of the day. If banks with surplus liquidity are doubtful about lending it, the overnight rate may rise as the banks that are short of liquidity will bid against each other for loans and thus increase the rate. The banks that are counterparties to the central bank can, alternatively, apply to the central bank to get overnight credit. The central bank's lending rate thus sets a ceiling for the overnight rate. In the same way, the central bank's deposit rate sets a floor. The central bank's deposit and lending rates thereby constitute an interest rate corridor within which the overnight rate is determined.

Under normal circumstances, the central bank adapts the level of the means of payment – usually called reserves – so that the banking system should not need to use the central bank's deposit and lending facilities. The central bank usually supplies a bank with reserves by buying a security from the bank at the same time as it is agreed that the bank will repurchase the security at a later date. These so-called repos normally have a term of one week. The price is determined by the policy rate set by the central bank. When the bank sells a security to the central bank, its account at the central bank is credited. The bank can then use the reserves to make payments to other members of the payment system or to order banknotes and coins from the central bank.

Some central banks also carry out daily operations. The Riksbank, for example, ensures that the position of the banking system in relation to the Riksbank is in balance on a day-to-day basis by carrying out so-called fine-tuning operations at the end of the day. The banks can then borrow from or deposit money with the Riksbank overnight at the repo rate (the Riksbank's policy rate) plus/minus 0.10 percentage points. Central banks that apply a reserve maintenance period instead adapt the supply of reserves to the banking system so that it will be possible for the banks, on average during a so-called reserve maintenance period (usually a few weeks), to keep the quantity of reserves in their accounts at the central bank that the central bank requires.⁴ Of the central banks we have studied, it is only the Bank of Canada and the Riksbank that do not apply a reserve maintenance period.

In order for monetary policy to have an impact on inflation and growth, changes in the policy rate must have an impact on the interest rates on loans with risk that are charged to households and companies. How does this work? Changes in the policy rate affect risk-free interest rates at longer maturities as these are partly determined by expectations regarding the policy rate in the future. The risk-free interest rates for securities issued by the State form the basis for interest rates for loans with risk. The latter should be higher than the risk-free interest rates as they include a premium that compensates the buyer for the credit risk. It is normal for credit risk premiums to vary over an economic cycle. However, in the event of unrest on the financial markets, liquidity premiums may also be high and fluctuate significantly over time.⁵ This makes

³ One exception is the Swiss National Bank (SNB) which controls a three-month interest rate.

⁴ The reserve maintenance period means that a bank is forced to retain a certain sum as reserves at the central bank. The size of and return on the reserves, as well as the duration of the reserve maintenance period, are decided in different ways at the different central banks.

⁵ Liquidity premiums compensate the buyer of a security for the risk that liquidity on the market may be limited when he wishes to sell it again. An illiquid market is characterised by a lack of buyers and sellers. On such a market, one can not expect that it will be possible to sell substantial volumes without this generating downward pressure on the price of the security.

pricing on the market more unpredictable. This is not desirable as an effective market is a precondition for the link between the policy rate and the interest rates offered to companies and households functioning normally.⁶

What have the central banks done about the problems?

Alongside their normal operations, the central banks have taken other more unconventional measures during the crisis. Examples of such measures include providing loans to their counterparties at longer maturities, providing loans in US dollars, approving a wider range of securities as collateral for loans and increasing the circle of monetary policy counterparties. In this review, we have studied measures taken by the Federal Reserve (Fed), the European Central Bank (ECB), the Bank of England, the Swiss National Bank (SNB), the Bank of Canada, the Bank of Japan and the Riksbank.

We divide the extraordinary measures taken by the central banks into the following five categories:

1. Extended opportunities for the banks to borrow from the central bank
2. Loans or direct purchases to support certain markets
3. Quantitative easing
4. Emergency liquidity assistance
5. Changes in deposit and lending facilities

The division into these five categories is not self-evident, but it has the advantage of making the boundaries between the categories rather clear.

Extended opportunities for the banks to borrow from the central bank

All of the central banks have attempted to provide access to credit at longer maturities by conducting open market operations (the purchase of securities with repurchase agreements or the provision of credit against collateral) with maturities of several months – usually three and six months. The Riksbank regularly loans Swedish kronor at maturities of three months (since October 2008) and six months (since February 2009). Since June 2009, the Riksbank also offers 12-month loans. The Bank of Canada and the ECB have also recently introduced loans with a maturity of 12 months.

All of the central banks except the Riksbank have entered into swap agreements with the Fed in order to be able to provide their banks with US dollars overnight. All of the central banks have, on the other hand, entered into swap agreements with the Fed in order to be able to provide their banks with dollars at longer maturities than overnight. This entails swapping (exchanging) one's own currency for dollars that can then be lent. The Riksbank, for example, lends dollars for three months (previously also one month). In October 2008, the ECB entered into a swap agreement with the SNB in order to supply the euro market with Swiss francs at a maturity of one week. The SNB has since signed similar swap agreements with the Polish and Hungarian central banks to supply these with Swiss francs.

It is the lending of US dollars, together with the loans in Swedish kronor at longer maturities, that have led the Riksbank's balance sheet total to grow from approximately SEK 200 billion before the crisis to around SEK 700 billion at the turn of the year 2008/2009 (see Figure 1 for a comparison of the central banks' balance sheet totals). The balance sheets of most central banks expanded dramatically when the crisis worsened after Lehman Brothers filed for bankruptcy in September 2008.

In addition, the Fed, the Bank of England, the Bank of Canada and the Riksbank have widened the circle of monetary policy counterparties. In October 2008, the Riksbank increased the number of counterparties that participate in the fine-tuning transactions,

⁶ See Hopkins, Lindé and Söderström (2009) for an analysis of how this link between the policy rate and the market rates has functioned in Sweden during the financial crisis.

while recently the Riksbank introduced a new class of restricted counterparties who may use some of the Riksbank's loan facilities.⁷

All of the central banks have also extended the range of securities that can be used as collateral for loans from the central bank. The Fed, the Bank of England and the Bank of Japan also lend liquid securities and instead accept less liquid securities as collateral. The more liquid securities can then be used in repos with other banks or with the central bank in order to acquire liquid means of payment.

Loans or direct purchases to support certain markets

The term "credit easing" (CE), was coined by the Chairman of the Federal Reserve Ben Bernanke.⁸ CE entails the central bank attempting to improve the functioning of those financial markets that are experiencing problems by buying securities on these markets or by funding the purchase of these securities by others.

The Fed, the Bank of Japan, the Bank of England and the Riksbank have attempted to alleviate the problems that have arisen on the market for commercial papers. The Fed and the Bank of Japan have set up programmes through which they purchase commercial papers directly from the issuers. The Bank of England buys commercial papers on the secondary market as well as in connection with new issues. The Riksbank has instead chosen a more indirect method. A company that wishes to issue papers sells these to its bank and the bank can then in turn use the papers as collateral for loans from the Riksbank.

The Fed also supports the secondary market in commercial papers by funding a bank's purchase of papers from money market funds.⁹ Just like the banks, money market funds are vulnerable to "runs" of investors who wish to withdraw their money. By increasing the likelihood that there is always someone who is willing to buy the papers, the Federal Reserve reduces the risk of such behaviour. The Fed also directly purchases certain mortgage bonds that are guaranteed by the Federal National Mortgage Association (FNMA, popularly referred to as Fannie Mae), the Federal Home Loan Mortgage Corporation (FHLMC, also known as Freddie Mac) and the Government National Mortgage Association (GNMA, also called Ginnie Mae). In addition, the Fed buys securities issued by Fannie Mae, Freddie Mac and Federal Home Loan Banks. The aim is to increase the households' access to mortgages and to reduce the costs of mortgages.

In January 2009, the Bank of England announced that it would launch a programme – the Asset Purchase Facility – to buy commercial papers and corporate bonds in order to support the markets for these securities. The programme is funded by the Treasury, which will compensate the Bank of England for any losses. In March 2009, the Bank of England began to buy corporate bonds on the secondary market. The aim of the programme is to facilitate trading in these bonds and thus reduce the liquidity premiums on the market.

The ECB, which for a long time only provided support through the banks, has now departed from this principle. Since the beginning of July 2009, the ECB buys covered bonds directly on the European markets. These securities give the holder a priority claim to certain of the issuer's assets in the event of bankruptcy and are therefore regarded as a safer investment than other bonds. They are strictly regulated (especially in Germany, which is the largest market for the ECB's purchases).

Quantitative easing

When policy rates recently began to approach zero in several countries, the central banks also began to experience problems in conducting a sufficiently expansionary monetary policy – problems which were not directly related to the problems in the

⁷ Prior to October 2008, only the so-called primary monetary policy counterparties could participate in fine-tuning activities. Since 8 October, all monetary policy counterparties can participate.

⁸ See Bernanke (2009).

⁹ This is done through two different programmes: the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) and the Money Market Investor Funding Facility (MMIFF).

financial system. Several central banks therefore introduced quantitative easing (QE). This measure entails the central bank setting an operational target for growth in the reserves that the banks keep in accounts with the central bank. The ultimate objective, however, is to squeeze the interest rates of those securities the central bank buys and of securities that are close substitutes for these. In quantitative easing, various securities are bought using reserves that the central bank creates without, in contrast to credit easing, any intention of supporting certain markets.¹⁰

Since 6 March 2009, the Bank of England's Asset Purchase Facility programme has had a partly different objective which falls under the heading of quantitative easing. The purchases are now funded using reserves; that is the Bank of England credits the seller's account in the payment system as payment for the securities purchased. Since March, the Bank of England's Monetary Policy Committee not only votes on the level of the policy rate but also on the volume of securities that the bank should buy during a certain period. The Bank of Japan is the central bank that has most experience of quantitative easing, which the bank already used in the period 2001–2006. This measure is now being used in Japan once again. The Fed has also initiated a programme to buy government bonds with the aim of squeezing interest rates at longer maturities.

Emergency liquidity assistance

Some central banks have provided emergency liquidity assistance to banks and other financial institutions that have been deemed to be so important to the stability of the payment system that they should not be allowed to go bankrupt. The Fed has provided assistance to the insurance company AIG and to the banking conglomerate Citigroup; the Bank of England to Northern Rock and the Riksbank to Carnegie Investment Bank AB and Kaupthing Bank Sverige AB. The Fed has also provided funding to the investment bank JP Morgan for the acquisition of Bear Stearns, and the SNB has funded a transfer of assets from the bank UBS to a new institution. Unlike the measures described above, such emergency liquidity assistance is aimed at individual financial institutions on the market.

Changes in deposit and lending facilities

The Fed, the ECB, the Bank of England, the Bank of Canada and the Riksbank have reduced the gap between their deposit rates and their lending rates. In other words, they have narrowed the corridors around their policy rates. In the case of the ECB and the Bank of England, this has been done to more firmly anchor expectations regarding the future overnight rate.

The other central banks have narrowed the corridor when the policy rate has approached zero in order to avoid the deposit rate becoming negative. The Fed and the Bank of Canada have also set the policy rate at the same level as the deposit rate, that is at the lower limit of the corridor, while other central banks have kept the policy rate in the centre of the corridor. However, there is nothing to say that the deposit rate can not be negative. On 1 July 2009, the Riksbank decided to cut the repo rate to 0.25 per cent and to retain the corridor of plus/minus 0.50 per cent. This entailed a deposit rate of minus 0.25 per cent. As the Riksbank carries out fine-tuning operations every day, only small sums remain to be transferred to the deposit facility when the payment system closes for the day. The negative deposit rate gives the banks an incentive to participate in the fine-tuning process or to lend money to each other if any of them have a deficit at the end of the day.

Conclusions

Central banks around the world have implemented extensive measures to counteract the effects of the financial crisis. In many cases, the same type of extraordinary measures

¹⁰ For a more detailed discussion of quantitative easing and credit easing, see Söderström and Westermark (2009).

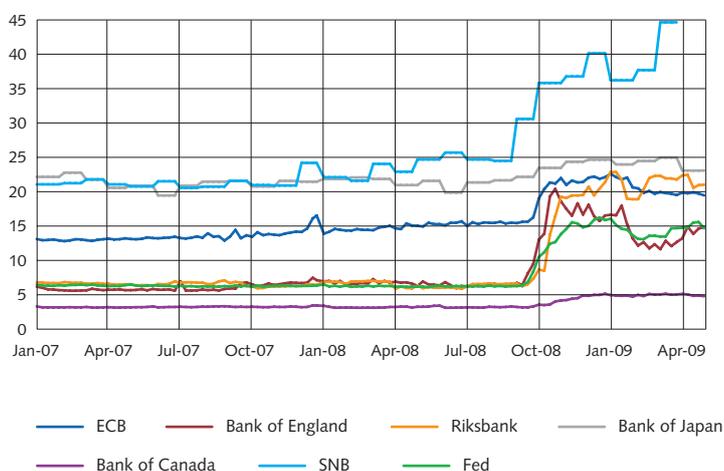
¹¹ For a more detailed discussion of differences in financial structures and crisis measures in different countries, see Sveriges Riksbank (2009).

have been used; these include providing loans to the counterparties at longer maturities, providing loans in US dollars, approving a wider range of securities as collateral for loans and increasing the circle of monetary policy counterparties.

In some cases, however, the central banks have chosen to take different measures to counteract the effects of the financial crisis in their respective countries. This is due to differences in the structure of the financial sector in the various countries.¹¹ One such important difference is that the financial markets are more developed in the USA than they are in Europe. The Fed has therefore used more measures that are intended to directly support various financial markets. In Sweden and the euro area, on the other hand, the companies are more dependent on the banks for the funding of their operations. The main focus of the measures taken by the Riksbank and the ECB has therefore been to support the banking system. Despite these differences, the aim of the various measures has been the same – to make it easier for companies and households to get loans in order to finance investments and consumption.

Figure

Figure 1. Development of the central banks' balance sheet totals
Total assets relative to GDP, per cent



Source: The central banks (assets) and the statistical authorities (nominal GDP) of the respective countries.

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