



Material for assessing monetary policy

2009

Introduction

The Riksbank is an authority under the Riksdag, the Swedish Parliament, with responsibility for monetary policy in Sweden. Since 1999, the Riksbank has had an independent position with regard to the Riksdag and the Government. This means that the six members of the Executive Board decide on monetary policy issues without seeking or taking instructions. Nor may any other authority determine how the Riksbank should decide on issues concerning monetary policy.

The way in which the Riksbank carries out the delegated task is followed up in various ways by the Riksdag. For instance, every year the Riksdag Committee on Finance examines whether the General Council of the Riksbank and the Executive Board can be discharged from liability for their administration during the past year. Every year, the Riksdag Committee on Finance also examines and assesses the monetary policy conducted by the Riksbank during the preceding years. The Riksbank compiles and publishes material for this assessment.

The material compiled by the Riksbank is thus a basis for assessment - not an assessment in itself. On the other hand, this does not mean that it is a pure compilation of figures. The material also includes analyses of outcomes, forecasts and events as the Riksbank believes that those who evaluate monetary policy should have access to the Riksbank's interpretation of the material. It is then up to the Committee on Finance, and others who wish to assess the material, to concur with the Riksbank's conclusions or to make another interpretation.

The Material for Assessing Monetary Policy is available on the Riksbank's website www.riksbank.se. It is also possible to order a printed version of the report free of charge on the website, or to download the report as a PDF.

To subscribe to the report, please contact the Riksbank.

E-mail: kontorsservicecenter@riksbank.se

Address: Sveriges Riksbank SE-103 37 Stockholm, Sweden

Telephone: 08-787 00 00

Further information on the Riksbank can be found at: www.riksbank.se

Monetary policy in Sweden

MONETARY POLICY OBJECTIVE

According to the Sveriges Riksbank Act, the monetary policy objective is “to maintain price stability”. The Riksbank has specified this target as keeping inflation, measured in terms of the annual change in the consumer price index (CPI), at two per cent. The Riksbank has set a tolerance interval around this target of plus/minus one percentage point. This interval draws attention to the fact that it is beyond the powers of monetary policy to exactly attain the target all of the time. It also serves to underline that excessively large deviations are unacceptable if the target is to remain credible.

MONETARY POLICY STRATEGY¹

Monetary policy is guided by, in addition to the CPI, various measures of “underlying inflation”. However, there is no single measure of inflation that at all times indicates the proper stance of monetary policy.

- Monetary policy is normally focused on achieving the inflation target within two years. This is partly because monetary policy has an effect on economic developments after a time lag. The two-year horizon also gives the Riksbank scope to take into account real economic developments (GDP growth, unemployment, employment and so on).
- The Riksbank’s monetary policy decisions also take into account changes in asset prices and other financial variables.
- The Riksbank’s forecasts are based on the assumption that the repo rate will develop in such a way that monetary policy can be regarded as well-balanced. In the normal case, a well-balanced monetary policy means that inflation is close to the inflation target two years ahead without there being excessive fluctuations in inflation and the real economy. At the same time, it is important to point out that long-term levels in production and employment are not affected by monetary policy, but governed by other factors, such as technology and access to labour.
- Openness and clarity in monetary policy are prerequisites for the successful combination of credibility for the inflation target and a flexible application of the target in the short term.

DECISION-MAKING PROCESS

The Executive Board of the Riksbank usually holds six monetary policy meetings in the course of a year, at which it makes decisions regarding the repo rate. In connection with three of these meetings a Monetary Policy Report is published and in connection with the other three a Monetary Policy Update is published. Approximately two weeks after each monetary policy meeting, the Riksbank publishes minutes from the meeting in which it is possible to follow the discussion that led to the interest rate decision and to see how the different Executive Board members argued and voted.

PRESENTATION OF THE INTEREST RATE DECISION

- The interest rate decision is presented in a press release at 9.30 a.m. on the day following the monetary policy meeting.
- A press conference is held on the day following the monetary policy meeting.

¹ A detailed description of the monetary policy strategy is provided in the document “Monetary policy in Sweden” which is available on the Riksbank’s website www.riksbank.se under the heading Monetary policy/Price stability. A review of this document is currently underway and a new version will be published during the year.

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■ Summary

The global financial crisis continued to mark the Riksbank's activities and monetary policy in 2009. Although the situation on the global financial markets improved during the year, the stability of the financial system was still at the end of the year dependent on the support measures taken by central banks and governments around the world. A severe international recession followed in the wake of the crisis, and it was necessary for monetary policy to counteract its effects.

Up to the autumn of 2008, the global financial crisis had only a fairly limited effect on the Swedish economy. However, when the US investment bank Lehman Brothers filed for bankruptcy in September, the situation changed dramatically. Expectations of a rather gentle downturn in economic activity rapidly changed to a much gloomier outlook. The Riksbank responded to this with substantial repo rate cuts and increased lending.

During 2009, the Riksbank continued to pursue an increasingly expansionary monetary policy in order to mitigate the effects of the international recession on production and employment in Sweden and at the same time stabilise inflation around the inflation target. The Riksbank reduced the repo rate from 2.0 per cent at the beginning of the year to 0.25 per cent in early July. The interest rate path, which is to say the Riksbank's forecast of the future development of the repo rate, was successively revised downwards during the first six months of the year. From July, the repo rate was held unchanged at 0.25 per cent and the Riksbank announced its intention of letting the repo rate remain at this low level for a relatively long period of time.

During the year, the international recession particularly affected the export-oriented parts of the Swedish economy, while the expansionary fiscal and monetary policies helped to keep up domestic demand. GDP fell by a total of 4.9 per cent in 2009.

The rate of inflation measured as the change in the CPI averaged -0.3 per cent in 2009; it was thus far below the inflation target of 2 per cent. CPI inflation fluctuated considerably during the latter part of 2008 and in 2009 as a result of the substantial changes in the repo rate. This is because the CPI includes mortgage costs. Inflation measured in terms of the CPIX, which is the CPI excluding the effects of the Riksbank's repo rate changes on mortgage costs averaged 1.9 per cent during the year.

The outcome for CPI inflation in 2009 was well below the forecasts that the Riksbank and other forecasters made in 2008 but close to the forecasts made in 2009. As mentioned above, the rapid and substantial repo rate cuts in 2008 and 2009 are the most important reason for this. The Riksbank, like other forecasters, also overestimated GDP growth and the repo rate in their forecasts in 2008 and early 2009. The forecasting errors were greater for all the forecasters in 2009 than in 2008. However, this reflects the greater

shocks that hit the economy rather than a poorer performance on the part of the forecasters.

A high level of confidence in the inflation target is fundamental to the Riksbank's efforts to achieve price stability. It also increases the ability of monetary policy to stabilise production and employment. Stable inflation expectations that are close to the inflation target a few years ahead can be interpreted to mean that the public is highly confident that the Riksbank will achieve its target. In 2009, inflation expectations five years ahead were close to 2 per cent, which shows that the public has confidence in the Riksbank's inflation target.

The Riksbank normally conducts monetary policy by using the repo rate and the repo rate path to influence the interest rates charged to households and companies. In 2009, however, the impact of the repo rate and the repo-rate path was more limited than normal due to the turbulence on the financial markets. The Riksbank responded to these problems by complementing monetary policy with extensive lending to the banks. The Riksbank decided on three occasions to offer the banks loans totalling SEK 100 billion at a fixed interest rate for a period of up to 12 months. The Riksbank's assessment is that these complementary measures have enabled the financial markets to function more effectively, have eased the supply of credit and have reduced various risk premiums that limited the impact of monetary policy. In addition, the Riksbank lent up to SEK 227 billion at a variable interest rate, which also gave support to monetary policy. By end of 2009, total lending at a variable interest rate was SEK 74 billion.

To sum up, since the autumn of 2008 the Riksbank has conducted a monetary policy that has stabilised underlying CPI inflation and long-term inflation expectations close to the inflation target of 2 per cent. At the same time, monetary policy has helped to dampen the fall in production and employment. In the longer term, the repo rate cuts will also help to keep CPI inflation up in line with the target.

■ CHAPTER 1 – The process of assessing monetary policy

Assessments of monetary policy are important for several reasons. One reason is the independent position of the Riksbank. A high level of transparency and regular evaluations are necessary to enable the Riksdag and the public to make sure that the Riksbank is performing to a high standard. Another reason is that assessments of monetary policy are central in enabling the Riksbank to develop and improve its monetary policy analysis in the best possible manner.

Monetary policy's objective and opportunities

Assessments of monetary policy should have as their starting point what monetary policy can actually achieve. Monetary policy can ensure that inflation is well in line with the inflation target over a number of years. Monetary policy can also contribute to stabilising developments in the real economy (GDP, unemployment, employment, and so on). On the other hand, both previous experience and economic theory have shown that monetary policy cannot be used to achieve a more permanent higher level of production, employment or growth in the economy.

Over the years, central banks have tested different ways of giving the economy a "nominal anchor", that is a credible target for nominal wage and price formation. Since the early 1990s, it has become increasingly common to formulate the nominal anchor in terms of an explicit inflation target. The Riksbank has such an inflation target according to which the annual change in the consumer price index (CPI) is to be 2 per cent.

The Riksbank uses a short-term interest rate, the so-called repo rate, as a policy rate to implement monetary policy. The Riksbank also publishes its own assessment of the development of the repo rate in the period ahead. Such an interest rate forecast (or interest rate path) makes it easier to explain the Riksbank's view of developments and its reasoning when the monetary policy decisions are made. It also makes it easier to steer expectations regarding the monetary policy that will be conducted in the future. Expectations regarding future interest rates influence the more long-term interest rates that are important to the economic decisions of the households and companies.

■■ Assessment in real time: was monetary policy well balanced?

In connection with every monetary policy decision, the Executive Board assesses what repo rate path is needed for monetary policy to be well balanced. In the normal case, a well-balanced monetary policy means that the forecast for inflation is close to the inflation target a couple of years ahead without there being excessive fluctuations in inflation and the real economy. It thus a question of finding an appropriate balance between stabilising inflation around the inflation

target and stabilising the real economy. The Riksbank thus conducts what is generally referred to as flexible inflation targeting.

Developments in the financial markets affect, and are affected by, variations in inflation and the real economy. The Riksbank's monetary policy decisions therefore constantly take into account changes in asset prices and other financial variables. However, this should not be interpreted as introducing targets for different asset prices or other financial quantities.

An important part of the assessment of monetary policy is to analyse whether the interest rate decisions were reasonable and monetary policy well balanced given the information that was available when the decisions were made. This is called assessing monetary policy in real time.

Chapter 2 provides an overview of the Riksbank's decisions for 2009 and the analysis on which they were based. There is also a box that describes some principles for assessing various monetary policy alternatives.

■ ■ Assessment after the fact: target fulfilment

A natural next step in the assessment is to compare the outcomes for inflation with the inflation target, that is to assess monetary policy after the fact. But, simply comparing the inflation outcome with the target is not sufficient for at least two reasons.

The first reason is that it takes time before changes in central bank policy rates have an effect on inflation. The effects come gradually and it is difficult to determine exactly how long it will take until the full impact is achieved. Monetary policy must therefore be based on forecasts of the development of the economy and forecasts are always uncertain. During the time it takes for changes in the interest rate to have a full impact on inflation the economy often has time to be affected by new and unexpected shocks. On the one hand, this means that the inflation outcome may be in line with the target even if the monetary policy decisions were incorrect because unexpected shocks nevertheless resulted in the right inflation outcome. On the other hand, the inflation outcome may also deviate from the target even if the monetary policy decisions were correct because unexpected shocks resulted in the inflation outcome being too high or too low.

The second reason is that monetary policy also aims to stabilise the development of the real economy. A deviation between the outcome and the target for inflation may thus be deliberate. It may be the result of an attempt to achieve a balance between stabilising inflation and stabilising the real economy. Over time, however, inflation should average 2 per cent.

A high level of confidence in the inflation target is fundamental to target fulfilment. Confidence in the inflation target helps to

ensure that wage formation and price setting are compatible with the target. This is very important to the Riksbank's efforts to achieve price stability. A high level of confidence in the inflation target also increases the possibilities for monetary policy to stabilise production and employment. By studying how inflation expectations relate to the inflation target and the Riksbank's inflation forecasts, one can assess the level of confidence in the inflation target.

Chapter 3 of this report analyses target fulfilment in 2009.

■ ■ Forecasts

As monetary policy is based on forecasts it is important that the Riksbank's forecasts are reasonably accurate. A reasonable next step in the assessment is therefore to compare the outcome for inflation in the year the assessment refers to with the forecasts for inflation made by the Riksbank for this particular year. These forecasts were used as a basis for the interest rate decisions made then; decisions which may have affected inflation and the real economy in 2009.

What demands can be made of a central bank's forecasts?

The answer is not entirely clear. Practical forecasting work is associated with a number of difficulties, many of which stem from the uncertainty of the forecasts. The economy is constantly affected by unexpected shocks which cannot be predicted. This means that the forecasts will always be more or less inaccurate. Analysing the accuracy of a forecast in an individual year thus provides limited information. A large forecasting error may in itself indicate that the forecast was poor, but it may also be a consequence of a shock occurring that could not have been predicted.

In practice, one way of assessing whether the Riksbank's forecasts have an acceptable level of accuracy is to compare them with the forecasts of other forecasters. If the Riksbank's forecasts are systemically poorer, this is obviously an indication that it would have been possible to make better assessments than those made by the Riksbank. This also means that there was better information available which the Riksbank would have been able to use as a basis for its decision-making.

Nor should the forecasts systematically overestimate or underestimate the actual outcomes. If, this is the case, viewed on average over a long period of time, then this is a sign that there is information that could be used to improve the forecasts.

A fair comparison of the accuracy of different forecasts should take into account the fact that the forecasts are made at different points in time and that different analysts therefore do not have the same amount of information available to them. The closer one comes to the outcome date for the variable being forecast, the more information the forecaster has regarding the way the variable has developed and on the shocks that have occurred. A comparison of the accuracy of the forecasts should therefore take into account that

the forecasts have been made at different times. In the comparison of forecasts performed in this report, a method that takes into account such differences has been used.

Chapter 4 of this report analyses the accuracy of the Riksbank's forecasts and compares this with the performance of other forecasters.

■ ■ Implementation of monetary policy

Relatively accurate forecasts and well-balanced monetary policy decisions are not in themselves enough to attain the inflation target. Monetary policy also needs to be predictable and have the desired impact on market rates.

Changes in the repo rate and the Riksbank's repo rate forecast have the desired impact if they are reflected in corresponding changes in the market rates charged to companies and households. If the Riksbank is successful in its communication activities, the market participants should also be able to predict rather well how new information or new shocks will affect the repo rate and the Riksbank's repo-rate path. One way of assessing the impact of monetary policy is thus to investigate how well aligned market expectations and the Riksbank's forecast regarding the future interest rate are.

Chapter 5 analyses the implementation of monetary policy.

At the start of each chapter there is a box that summarises the content of the chapter.²

² For a more detailed description of how one can assess monetary policy see Lars E.O. Svensson, "Assessing monetary policy", speech at Uppsala University, 13 March 2009.

The monetary policy decision-making process³

The monetary policy decisions

The Executive Board normally holds six scheduled monetary policy meetings a year. The Executive Board's monetary policy meetings are scheduled around six months in advance, partly as fixed points in the internal work, and partly to inform the general public and others who regularly follow developments in monetary policy.

Bases for the decisions

The forecasting work prior to each monetary policy meeting begins with the Monetary Policy Department analysing new statistics and new events in the economy. The department then produces a forecast for how inflation, the repo rate and the economy will develop. At a relatively early stage of the process the department presents its forecast alternatives to the Executive Board at meetings of what is known as the monetary policy group. At these meetings there is a discussion between the members of the Executive Board and employees of the Monetary Policy Department on the forecast and the alternative scenarios.

The Monetary Policy Department then continues its work and compiles a document that is a first draft of the Monetary Policy Report. This document is revised at a meeting of the Executive Board, where the Executive Board continues to discuss the various alternative forecasts and how they should be presented in the Monetary Policy Report. The editorial work on the Monetary Policy Report continues, but the final adjustments are not made to the text until after the monetary policy meeting. The Monetary Policy Report is published on the Riksbank's website at the same time as the decision on the repo rate is published; normally the day after the monetary policy meeting. The printed version of the report is published slightly later.

Prior to the monetary policy meetings that do not coincide with the publication of a Monetary Policy Report, the forecasting work is similar. The assessments made by the Monetary Policy Department are compiled to form a Monetary Policy Update that is presented at a meeting of the monetary policy group. This report contains a brief description of new information and the updated forecasts and is published together with the press release that announces the decision.

³ For a more detailed description of the monetary policy decision-making process, see Kerstin Hallsten and Sara Tågström "The decision-making process – how the Executive Board of the Riksbank decides on the repo rate", *Sveriges Riksbank Economic Review*, No. 1, 2009.

The Riksbank uses various macroeconomic models to create a cohesive picture of the development of the economy and how any new information that becomes available should be interpreted. The models are used primarily to produce alternative forecasts for the repo rate, inflation and the economy. These alternative scenarios show how developments will be if special events in the economy occur or if monetary policy is conducted differently than is assumed in the main forecast. However, models – no matter how sophisticated they may be – are only simplifications of reality. They must be complemented by analyses and assessments. The assessments become particularly important when unusual events and structural changes that alter the functioning of the economy take place.

On the basis of the material described here, the members of the Executive Board jointly determine what they consider to be a well-balanced monetary policy. Naturally, there are occasionally differences of opinion in the Executive Board as to how inflation and the real economy will develop and thereby as to what constitutes a well-balanced monetary policy. In these cases, it is the majority view that is expressed in the decision and in the Monetary Policy Report or Monetary Policy Update.

■ CHAPTER 2 – Monetary policy 2009

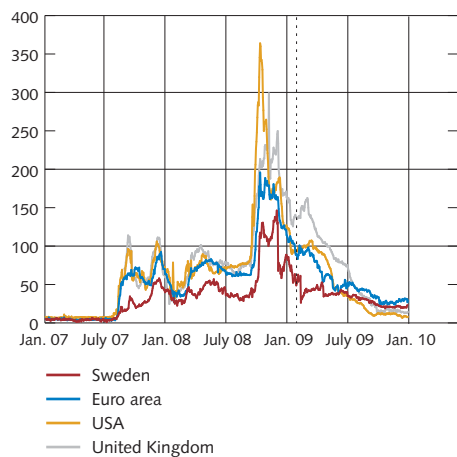
In order to meet the inflation target and to mitigate the impact of the financial crisis on the real economy, the Riksbank continued to pursue an increasingly expansionary monetary policy during 2009. The repo rate was cut from 2.0 to 0.25 per cent between the start of the year and the start of July. The Riksbank deemed that the repo rate in practice had reached its lowest level. The interest rate path, which is to say the Riksbank's forecast of the future development of the repo rate, was successively revised downwards during the first six

months of the year. From July, the repo rate was held unchanged at 0.25 per cent and the Riksbank announced its intention of letting the repo rate remain at this low level for a relatively long period of time. At the same time, disruptions on the financial markets entailed increased difficulties in implementing monetary policy, both in Sweden and abroad. Therefore, in order for the interest rate cuts to have the desired effect, the Riksbank, like other central banks, adopted complementary measures, including increased lending to the banks.

Summary:

- At the monetary policy meeting on 10 February, the decline in economic activity, both in Sweden and abroad, looked likely to be deeper and to develop more rapidly than the Riksbank had assessed at the end of 2008. Consequently, the repo rate was cut by 1 percentage point to 1 per cent. The interest rate path was adjusted downwards and a further interest rate cut during 2009 was indicated.
- GDP continued to decrease rapidly during the first quarter of the year and the GDP forecast for 2009 was revised downwards. The Riksbank also assessed that CPI inflation would decrease very rapidly during 2009, which was largely due to the rapid interest rate cuts implemented at the end of 2008 and start of 2009. At the monetary policy meeting on 20 April, the repo rate was cut by 0.5 percentage points to 0.5 per cent. The repo rate was expected to remain at a low level until the beginning of 2011.
- In July, the assessment was that the decline in economic activity during 2009 would be slightly deeper than the Riksbank had assessed in April. The repo rate was cut by 0.25 percentage points to 0.25 per cent at the monetary policy meeting on 1 July. The repo rate was expected to remain at a low level until the autumn of 2010. The Riksbank assessed that the situation on the financial markets was still not entirely normal. Complementary measures were necessary to ensure that monetary policy would have the intended effect. The Riksbank therefore determined to offer loans totalling SEK 100 billion to the banks at a fixed interest rate and with a maturity of 12 months. It was deemed that this measure could contribute to lower interest rates on loans to companies and households.
- Increasing amounts of signs of a turnaround in the economy started to be seen after the decision in July. At the monetary

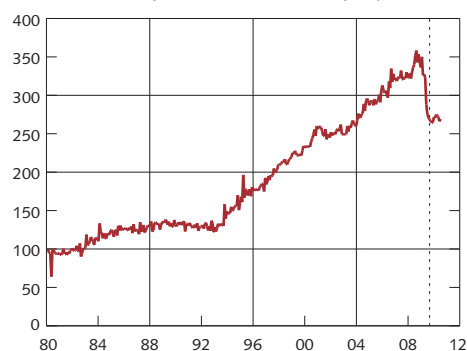
Figure 2:1. The difference between interbank rates and anticipated policy rates (the basis spread)
Basis points



Note. The difference is calculated as the difference between three-month interbank rates and three-month overnight indexed swap rates. The broken vertical line indicates the date of publication of the Monetary Policy Report in February.

Sources: Reuters Ecowin and the Riksbank

Figure 2:2. Goods exports at fixed prices
Index, January 1980 = 100, seasonally adjusted data



Note. The broken vertical line indicates the date of publication of the Monetary Policy Report in February.

Sources: Statistics Sweden and the Riksbank

policy meetings on 2 September and 22 October, it was decided to keep the repo rate unchanged at 0.25 per cent. The forecast for the repo rate was also held unchanged on both occasions. As a complementary monetary policy measure, the Riksbank decided, on both occasions, to make further fixed interest rate loans of up to SEK 100 billion available to the banks for approximately twelve months.

- Recovery from the deep recession continued during the autumn. At the Monetary Policy Meeting on 15 December, the Riksbank resolved to leave the repo rate unchanged, at 0.25 per cent. The forecast for the repo rate was also held unchanged.

The Riksbank's monetary policy decisions are the result of the Executive Board's assessment of the repo rate path necessary for a well-balanced monetary policy. This chapter provides an overview of the Riksbank's decisions for 2009 and the analysis forming the basis for these. The description of the three meetings at which the Riksbank chose to publish alternative repo rate paths (decisions in conjunction with the Monetary Policy Report) includes a discussion of the alternative repo rate paths and the associated forecasts for inflation and the real economy.

Repo rate cut and repo rate path revised downwards in February

At the meeting in February, the decline in economic activity, both in Sweden and abroad, looked likely to be deeper and to develop more rapidly than the Riksbank had assessed at the end of 2008. International growth forecasts were revised sharply downwards and GDP was expected to decline in all of the developed economies during 2009. There were also clear signals of a sudden slowdown in world trade. In December 2008, world trade fell by almost 10 per cent, compared with the same month in the previous year, which was the largest decline since at least the end of the 1940s.

On the other hand, at the start of the year, the situation on the financial markets seemed to have improved slightly. The difference between interbank rates and anticipated policy rates (the basis spread) decreased. However, the situation was far from normal and the spreads remained high (see Figure 2:1). The stability of the financial markets was dependent upon the support measures implemented by central banks and governments around the world.

The gloomy developments abroad and the rapid downturn in world trade hit Sweden hard, as the Swedish economy is strongly dependent on exports. In the first quarter of 2008, exports comprised

just above 40 per cent of total demand in Sweden. During the final quarter of 2008, Swedish exports of goods decreased by over 10 per cent (see Figure 2:2). Indicators for export orders indicated a continued sharp decline in the period ahead.

The weakening of the labour market looked likely to be greater than the Riksbank had assessed at the end of 2008. The number of redundancy notices increased strongly, showing the highest levels since the end of 1992 (see Figure 2:3). Various indicators also showed a rapid fall in resource utilisation in the economy. Consequently, the GDP forecast for Sweden was revised downwards for 2009 and 2010, but was revised upwards slightly for 2011. Both CPI inflation and inflation expectations had decreased more than the Riksbank had assessed in December 2008.

At the Monetary Policy Meeting in February, the Riksbank cut the repo rate by 1 percentage point at the same time as the repo rate path was adjusted downwards. The Riksbank also announced the possibility of further slight repo rate cuts in 2009 (see Figure 2:4). The large reduction in the interest rate and the interest rate path was deemed necessary to dampen the fall in production and employment and to attain the inflation target of 2 per cent.

Was the large reduction in the interest rate and the repo rate path justified, given the economic development described above?

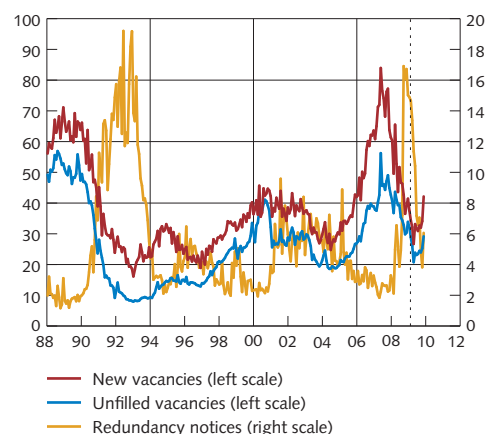
The Monetary Policy Report from February 2009 presented forecasts for inflation and GDP based on the Report's main scenario and alternative forecasts based on the repo rate path prepared at the meeting in December 2008.⁴ The alternative repo rate paths are shown in Figure 2:5, where the higher repo rate path (the blue broken curve) represents the forecast from December 2008. The lower repo rate path (the red broken curve) represents the Riksbank's main scenario from February 2009.

The Riksbank's inflation targets are expressed in terms of CPI inflation. However, this varied strongly during the later part of 2008 and in 2009, due to the major changes in the repo rate. In such a situation, it becomes more reasonable to follow inflation measured in terms of the CPIF, which excludes interest rate changes. Figure 2:6 illustrates the Riksbank's forecasts for CPIF inflation, based on the two repo rate paths. The lower repo rate path, as proposed in the main scenario, gave an inflation forecast, measured in terms of the CPIF, approaching 2 per cent, two years ahead. The higher repo rate path, instead, gave an inflation forecast falling short of the target during the entire forecast period. Equivalent forecasts for CPI inflation are illustrated in Figure 2:7.

Various measures of resource utilisation are often used as an overall measure of the development of the real economy. The Riksbank uses a number of different measures and indicators to assess the total utilisation of resources in the economy.⁵ One of these

Figure 2.3. New and unfilled job vacancies and redundancy notices

Thousands, seasonally adjusted data

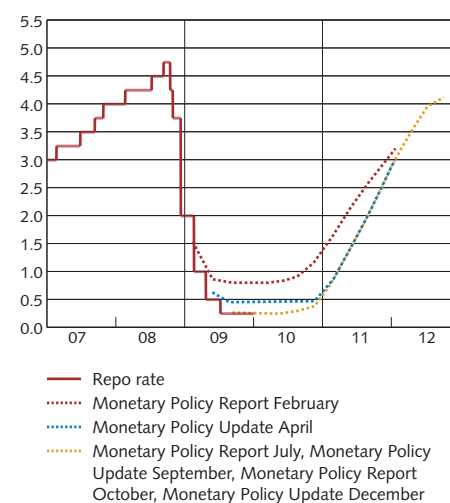


Note. The broken vertical line indicates the date of publication of the Monetary Policy Report in February.

Source: Swedish Employment Service

Figure 2.4. Repo rate outcome and repo rate forecasts in 2009

Per cent

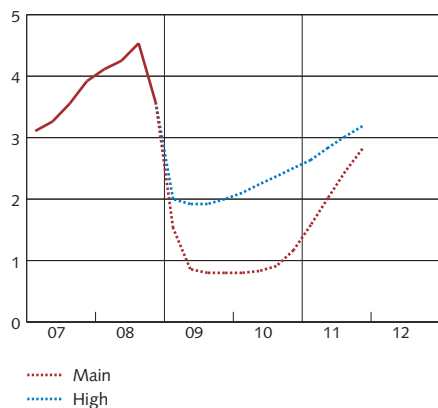


Note. Broken lines represent the Riksbank's forecasts. The forecast for the final quarter of 2012 has been taken from the Monetary Policy Report, October 2009 and the Monetary Policy Update, December 2009.

Source: The Riksbank

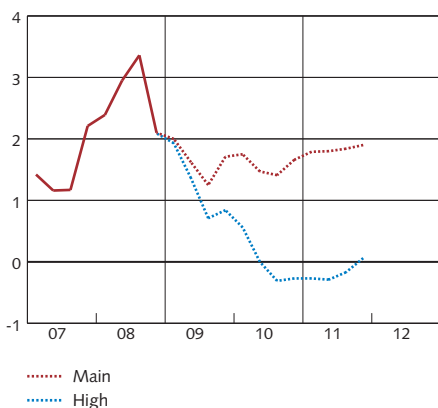
⁴ Alternative forecasts for the repo rate are published in the monetary policy reports, three times per year. Alternative forecasts for the repo rate are also discussed ahead of the remaining monetary policy meetings, but these are not published in the Monetary Policy Updates.

Figure 2:5. Alternative repo rate forecasts
Per cent, quarterly averages



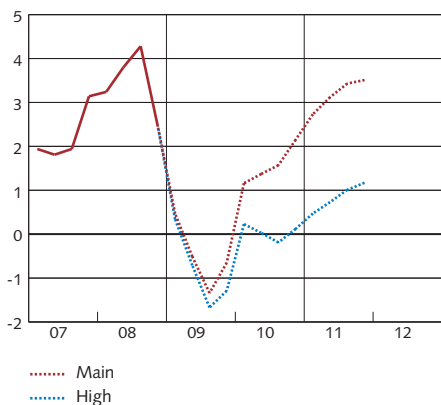
Note. The broken line refers to the Riksbank's forecast in Monetary Policy Report February.
Sources: Statistics Sweden and the Riksbank

Figure 2:6. CPIF
Annual percentage change



Note. The broken line refers to the Riksbank's forecast. No forecast for the CPIF based on the alternative repo rate path was published in the Monetary Policy Report February. This forecast has been calculated afterwards.
Sources: Statistics Sweden and the Riksbank

Figure 2:7. CPI
Annual percentage change



Note. The broken line refers to the Riksbank's forecast in Monetary Policy Report February.
Sources: Statistics Sweden and the Riksbank

measures is the output gap, calculated as the percentage difference between GDP and an HP trend.⁶ If the gap is positive, this signifies that the level of activity in the economy is high and that GDP is above its trend level as estimated by this method. The opposite applies when the gap is negative. Figure 2:8 illustrates the output gap based on the two repo rate paths. Both paths resulted in forecasts with negative GDP gaps during the forecast period, that is to say resource utilisation below the normal level. However, using the repo rate path in the main scenario gave a less negative output gap than using the repo rate path from December 2008.

Another measure of resource utilisation used by the Riksbank is the labour market gap. It illustrates resource utilisation measured as the number of hours worked in relation to an estimated long-term trend (HP trend). Figure 2:9 illustrates the labour market gap based in the two repo rate paths in February. Similarly to the output gap, the interest rate path in the main scenario also closed the labour market gap better.

⁵ Work is currently underway within the Riksbank to further develop and fine-tune these measures.

⁶ The Hodrick-Prescott filter (HP filter) is a statistical method for decomposing the development of a variable into trend and cyclical components. The method can be described as a weighted double-sided moving average where greater weight is placed on observations close at hand and gradually decreasing weight on more distant observations. The production gap according to the HP method should not necessarily be interpreted as the Riksbank's overall assessment of resource utilisation.

Repo rate cut to 0.5 per cent in April

The statistics published after the monetary policy meeting in February indicated that the decrease in global GDP during the fourth quarter of 2008 was larger than had previously been assessed. In both the United States and euro area, GDP decreased by over 6 per cent, calculated as an annual rate, during the final quarter of 2008 (see Figure 2:10). The decrease in employment experienced in the United States during the autumn and winter of 2008 was the largest recorded since 1939, and unemployment rose dramatically. Furthermore, inflation decreased rapidly in both the United States and the euro area.

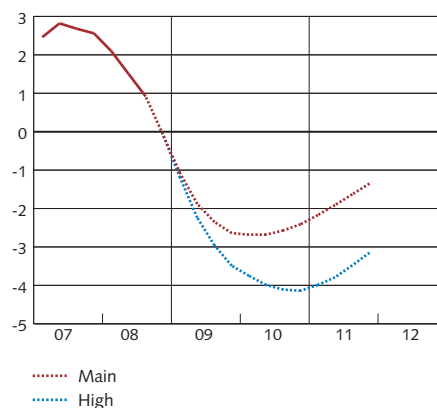
Surveys in the United States, the euro area and Sweden indicated that credit terms and conditions for companies were restrictive and that the risk existed that they would become even more restrictive. Consequently, alongside the substantial policy rate cuts, several central banks adopted other measures to ease the supply of credit, such as the purchase of government bonds or mortgage-related assets.

The outcome for GDP was also weaker in Sweden than had been estimated by the Riksbank in February. The statistics revealed that GDP had decreased by just above 9 per cent during the fourth quarter of 2008 in comparison with the previous quarter, when calculated at an annual rate. Indicators summarising the situation for the Swedish economy, such as the Tendency Surveys of the National Institute of Economic Research and the Purchasing Index for the Manufacturing Industry, also unambiguously revealed very weak development during the first part of 2009.

All in all, the outcome and indicators revealed that GDP had continued to fall sharply during the year's first quarter and the GDP forecasts for 2009 were accordingly adjusted downwards against the Riksbank's assessment in February. The Riksbank also assessed that CPI inflation would decrease very rapidly during 2009, which was largely due to the rapid repo rate cuts implemented at the end of 2008 and beginning of 2009.

In light of this, at the monetary policy meeting in April, the Riksbank decided to cut the repo rate to 0.5 per cent. At the same time, it was also announced that the repo rate was expected to remain at a low level until the start of 2011 (see Figure 2:4), and that some probability existed that the repo rate could be cut further in the future. However, at the same time, the Executive Board pointed out that when the repo rate is so low, it must be considered that this

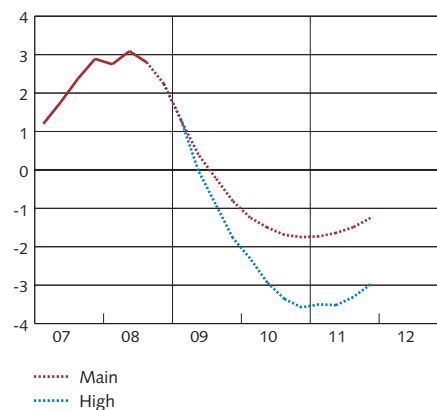
Figure 2:8. Production gap
Percentage deviation from the HP trend



Note. The broken line refers to the Riksbank's forecast in Monetary Policy Report February.

Sources: Statistics Sweden and the Riksbank

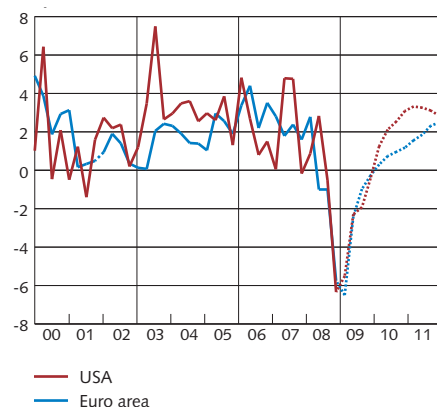
Figure 2:9. Labour market gap (hours worked)
Percentage deviation from the HP trend



Note. The broken line refers to the Riksbank's forecasts in the Monetary Policy Report February.

Sources: Statistics Sweden and the Riksbank

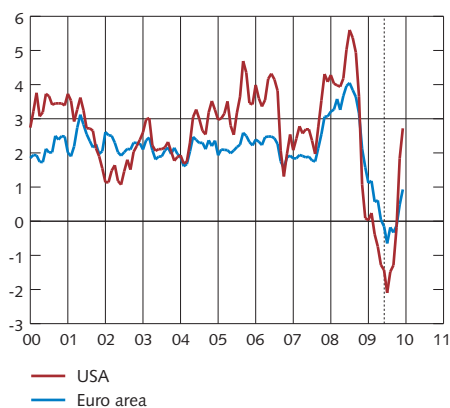
Figure 2:10. GDP in the United States and the euro area
Quarterly change in per cent calculated as an annual rate, seasonally adjusted data



Note. The broken line refers to the Riksbank's forecast in the Monetary Policy Update April.

Sources: Bureau of Economic Analysis, Eurostat and the Riksbank

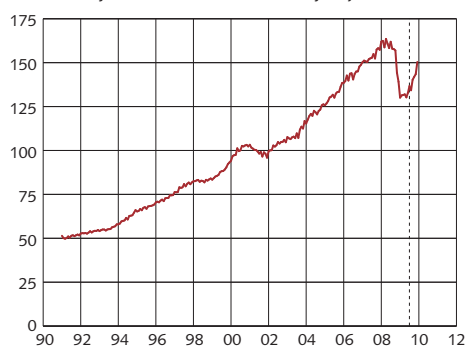
Figure 2:11. Consumer prices
Annual percentage change



Note. The broken vertical line indicates the date of publication of the Monetary Policy Report July.

Sources: The Bureau of Labor Statistics and Eurostat

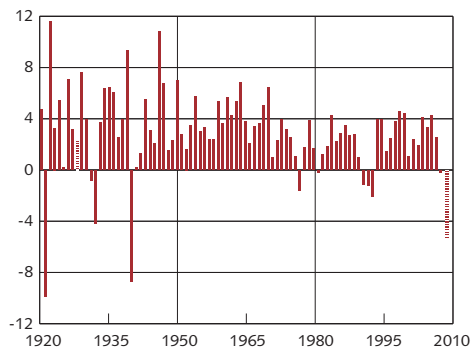
Figure 2:12. Volume of world trade (World trade monitor index)
Index, year 2000 = 100, seasonally adjusted data



Note. The broken vertical line indicates the date of publication of the Monetary Policy Report July.

Source: Netherlands Bureau for Economic Policy Analysis

Figure 2:13. GDP in Sweden
Annual percentage change



Note. Striped bars represent the Riksbank's forecast in the Monetary Policy Report July.

Sources: Statistics Sweden and the Riksbank

could have negative effects on the way the financial markets function. Furthermore, the Executive Board announced that, should economic activity continue to decline more than expected in the period ahead, the Riksbank had the possibility of implementing other measures than further repo rate cuts (see the box "The Riksbank's complementary measures").

Deputy Governor Lars E.O. Svensson entered a reservation against the decision, advocating a decrease of the repo rate to 0.25 per cent and a repo rate path in which the repo rate would remain on this low level a number of quarters into 2010. He explained his stance by arguing that such an interest rate path would entail a better-balanced monetary policy with higher resource utilisation and lower unemployment, without inflation deviating too far from the target.

Repo rate cut further to 0.25 per cent in July

The situation on the financial markets in Sweden and abroad started to show signs of improvement during the spring. However, economic development in the world remained very weak. In the period leading up to the start of 2009, the global economy underwent the most rapid decline in economic activity since the Second World War, and, in many countries, GDP continued to decline during the first quarter of 2009. Central banks around the world continued to pursue highly expansionary monetary policies by keeping policy rates close to zero. Inflation abroad continued to decrease, primarily due to lower energy prices (see Figure 2:11).

However, during the spring, several signals appeared to suggest that the fall in the world economy had been checked. There were signs of an improvement in Asia, above all in China, where extensive fiscal policy measures now seemed to have provided results. There were also indications that the fall in the US economy had slowed down. The heavy decline in world trade seemed to have ceased and a certain degree of stabilisation also seemed to have taken place in this area (see Figure 2:12).

Once the severe depression had begun, GDP in Sweden declined more rapidly than in the euro area and the United States. According to several indicators, resource utilisation rapidly decreased to very low levels. In July, the Riksbank estimated that GDP would fall by over 5 per cent for the full year 2009, entailing a greater decline than forecast in the Monetary Policy Update in April. No similar fall in GDP had been experienced in Sweden since 1940 (see Figure 2:13).

CPI inflation continued to decrease in line with the forecast from April, primarily due to the sharp fall in mortgage rates.

However, there were signs that the decline in economic activity

had also slowed down in Sweden. Indicators and outcome suggested that consumption during the second quarter had developed somewhat more strongly than was forecast in April. Orders from the export market recovered slightly before the end of the first six-month period. At the same time, different confidence indicators suggested a certain degree of recovery. Despite this, most indicators were far below normal levels and the outlook for economic activity still remained uncertain.

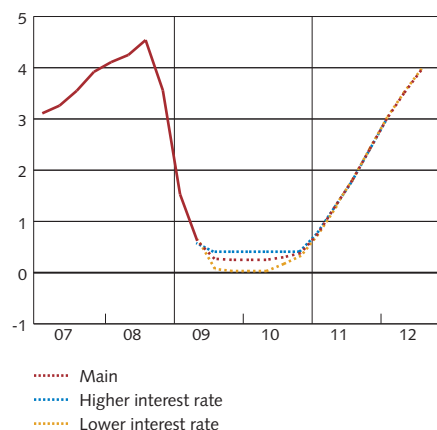
However, all in all, the assessment was that the decline in economic activity during 2009 would be slightly deeper than was assessed in April. In light of this, the Riksbank deemed that the repo rate and repo rate path needed to be decreased. Consequently, on 2 July, the Riksbank cut the repo rate by 0.25 percentage points to 0.25 per cent. The Riksbank also analysed the issue of the repo rate's lower bound and deemed that the agreed decrease threatened neither the functioning of the financial markets nor the inflation target.⁷ The new repo rate path entailed that the repo rate would still be at this level one year ahead (see Figure 2:4). Furthermore, the Riksbank deemed that, following the decrease to 0.25 per cent, the repo rate in practice had reached its lowest level.

At the same time, the situation on the financial markets continued to be very uncertain. Major divergences between the market's repo rate expectations and the Riksbank's repo rate path also arose during the year (see Figures 5:4 – 5:5). This resulted in monetary policy having less effect than intended. In order to support monetary policy and ensure that it had the intended effect, the Riksbank decided to lend up to SEK 100 billion to the banks in the form of fixed interest-rate twelve-month loans. This measure was deemed to contribute towards lower interest rates on loans to companies and households (see the box "The Riksbank's complementary measures").

Deputy Governor Lars E.O. Svensson entered a reservation against the decision to cut the repo rate to 0.25 per cent. He advocated a decrease of the repo rate to 0 per cent, to be maintained at this level one year ahead. Svensson considered that such a repo rate path would entail a better balanced monetary policy, with lower unemployment and higher resource utilisation without inflation deviating too far from the target.

Deputy Governor Barbro Wickman-Parak supported the decision to cut the repo rate to 0.25 per cent, but entered a reservation against the growth forecasts and the repo rate path these entailed, in the Monetary Policy Report. Wickman-Parak had a more positive view of the economic outlook in Sweden and abroad. Consequently, she

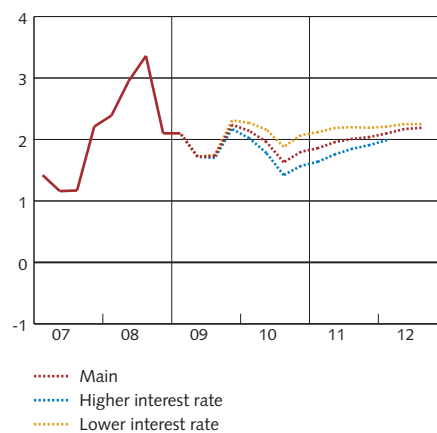
Figure 2:14. Alternative repo rate forecast
Per cent, quarterly averages



Note. The broken line refers to the Riksbank's forecast in Monetary Policy Report July.

Sources: Statistics Sweden and the Riksbank

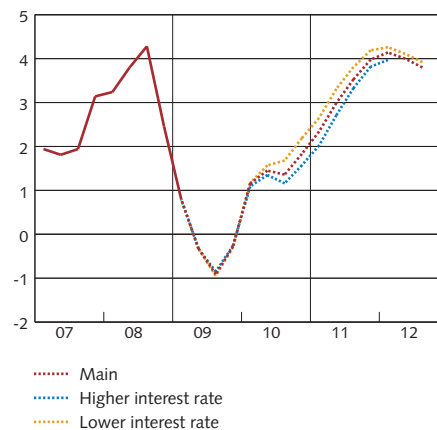
Figure 2:15. CPIF
Annual percentage change



Note. The broken line refers to the Riksbank's forecast in Monetary Policy Report July.

Sources: Statistics Sweden and the Riksbank

Figure 2:16. CPI
Annual percentage change

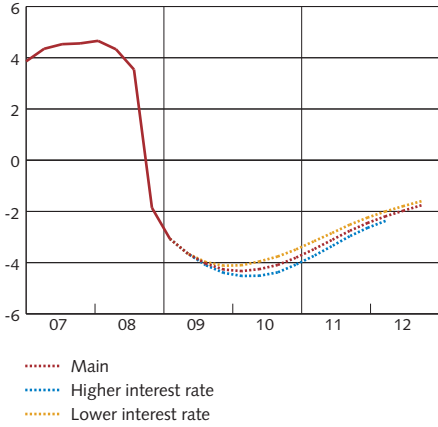


Note. The broken line refers to the Riksbank's forecast. No forecasts for the CPI based on the alternative repo rate paths were published in the Monetary Policy Report July. These forecasts have been calculated afterwards.

Sources: Statistics Sweden and the Riksbank

⁷ See M. Beechey and H. Elmer "The lower limit of the Riksbank's repo rate", Economic commentaries No. 11, 2009, Sveriges riksbank.

Figure 2:17. Production gap
Percentage deviation from the HP trend



Note. The broken line refers to the Riksbank's forecast. No forecasts for the production gap based on the alternative repo rate paths were published in the Monetary Policy Report July. These forecasts have been calculated afterwards.

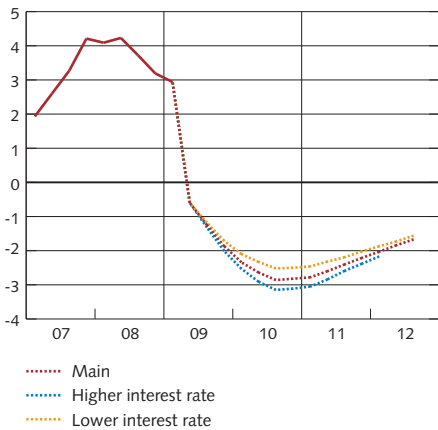
Sources: Statistics Sweden and the Riksbank

considered that the repo rate could need to be increased earlier than forecast in the main scenario of the Monetary Policy Report.

The alternative interest rate paths published in the Monetary Policy Report in July and the associated forecasts for inflation and the output and labour market gap according to the HP method are shown in Figures 2:14 – 2:18. The repo rate path agreed upon by the majority of the Executive Board is equivalent to the forecasts in the Monetary Policy Report's main scenario.

The lower repo rate path (the yellow curve) is equivalent to that advocated by Deputy Governor Lars E.O. Svensson. It can be seen that this repo rate path leads to a slightly less negative output and labour market gap according to the HP method than in the case in which the repo rate is set according to the repo rate path in the main scenario. At the same time, inflation becomes slightly higher during the entire forecast period.

Figure 2:18. Labour market gap (hours worked)
Percentage deviation from the HP trend



Note. The broken line refers to the Riksbank's forecast in Monetary Policy Report July.

Sources: Statistics Sweden and the Riksbank

The Riksbank normally conducts monetary policy by using the policy rate (the repo rate) and the repo rate path to influence the interest rates charged to households and companies. However, during the financial crisis, it has been necessary to complement the monetary policy toolbox with more unconventional measures in order to get the financial markets to function more effectively, to ease the supply of credit and to reduce various risk premiums that counteract the impact of monetary policy.

The Riksbank's complementary measures included offering loans to counterparties at longer maturities than usual, offering loans in US dollars, approving a wider range of securities as collateral and increasing the number of counterparties. During 2008–2009, the Riksbank offered loans to the banking system with durations of three, six and twelve months, to enable the banks to manage their short and medium-term funding more easily and effectively and to enable the lowering of interest rates on loans to companies and households. Figure B1 illustrates the development of the Riksbank's lending to the banks. Table B1 provides an overview of some of the Riksbank's complementary measures in 2008–2009.

The complementary measures, in conjunction with the substantial cuts in the repo rate, have had the desired effect. The conditions on the financial markets became less strained during 2009. Both the Riksbank's company surveys and the National Institute of Economic Research's Business Tendency Survey indicate that major companies and banks found it easier to obtain funding on the market in 2009. Financial market statistics show that lending to households via banks and credit institutes increased, but at a slower rate than before. On the other hand, lending to companies decreased somewhat, although fairly slightly considering the major downturn. The difference between interbank rates and anticipated policy rates increased heavily when the crisis became acute during the autumn of 2008, but has subsequently decreased successively and is now on the same level as prevailed during the autumn of 2007. Other measures of how well the credit market is functioning reveal a similar development.

The Riksbank has also carried out ongoing analyses of the possibility of implementing further stimulations if necessary. One alternative would have been to purchase various types of securities, primarily government bonds and mortgage bonds with longer durations. As in the case of lending at a fixed interest rate, the primary aim of buying government bonds and mortgage bonds is to reduce interest rates in general. However, on several occasions, the Riksbank deemed that the measures implemented were sufficient to influence inflation and the real economy in the desired direction and that, consequently, there was no need to buy government bonds or mortgage bonds.

Figure B1. The Riksbank's lending to the banks.
SEK, billions

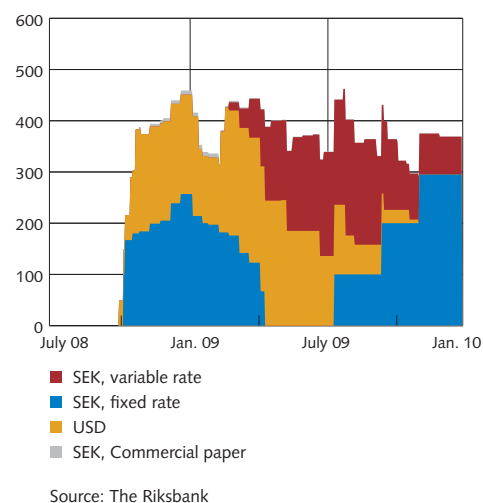


Table B1. The Riksbank's complementary measures 2008 – 2009⁸

2008-09-22	The Riksbank decides to increase credit facilities in the RIX payment system. ⁹ The permitted percentage of covered bonds from an institution with close links to the counterparty concerned that can be used as collateral in the system is increased from 75 per cent to 100 per cent.
2008-09-27	The Riksbank announces a new loan facility in USD.
2008-10-02	The Riksbank sets up a loan facility in kronor with the aim of increasing access to longer-term loans.
2008-10-08	The Riksbank once again changes the collateral requirements for credit in the RIX system. The permitted percentage of covered bonds from an institution with close links to the counterparty concerned that can be used as collateral in the system is increased from 75 per cent to 100 per cent. At the same time, it is also decided to lower the minimum credit rating requirement for longer-term securities pledged as collateral.
2008-10-24	The Riksbank announces that it will offer three-month loans in SEK in a programme of regular auctions.
2008-10-29	The Riksbank announces that it is establishing a new temporary credit facility in which the banks can use commercial paper with a maturity of up to one year as collateral to a greater extent than before. The purpose of the new credit facility is to facilitate the supply of credit for non-financial companies.
2009-02-13	The Riksbank offers long-term loans at a variable interest rate. The loans are provided against normal collateral for up to six months, and against collateral in the form of commercial paper for up to twelve months.
2009-04-03	The Riksbank increases the number of <i>monetary policy counterparties</i> by allowing more financial institutions the possibility of becoming <i>restricted monetary policy counterparties</i> . ¹⁰ Restricted monetary policy counterparties receive access to the Riksbank's temporary credit facilities without being participants in RIX.
2009-05-07	The Riksbank offers twelve-month loans in Swedish kronor against collateral.
2009-07-02	The Riksbank decides to offer loans at a fixed interest rate against collateral with a maturity of twelve months.
2009-09-03	The Riksbank decides to offer a second round of loans at a fixed interest rate against collateral with a maturity of approximately twelve months.
2009-10-22	The Riksbank decides to offer a third round of loans at a fixed interest rate against collateral with a maturity of approximately eleven months.

8 The table illustrates a selection of measures. A complete list of all measures implemented by the Riksbank is available at the Riksbank's website, www.riksbank.com.

9 RIX is the Riksbank's payment system. It is a central payment system that manages payments to and from the banks' accounts with the Riksbank.

10 A *monetary policy counterparty* is a credit institute with a registered office or branch in Sweden which is a participant in RIX, the Riksbank's system for account transfers, and which thus have access to credit facilities at the Riksbank. Counterparties currently total 14 banks. A *restricted monetary policy counterparty* must have a registered office in Sweden, but does not need to be a participant in RIX. Restricted monetary policy counterparties can make use of some of the Riksbank's facilities that otherwise require status as monetary policy counterparty for participation. The facilities in which restricted counterparties can participate/have participated are: i) programmes for credit in Swedish krona with a variable interest rate (with the same collateral requirement as for credit in RIX), ii) fixed interest-rate loans and iii) purchase of Riksbank Certificates. At present, restricted monetary policy counterparties are Svensk Exportkredit, Kommuninvest i Sverige, Sparbanken Finn and Öhman Fondkommission.

Repo rate path held unchanged in both September and October

Increasing amounts of signs of a turnaround in the economy started to be seen after the decision in July. The financial crisis slackened off, which was reflected by the fall in credit spreads in several areas, for example in the United States and the euro area. At the same time, both outcomes and indicators of future economic growth stabilised or showed an upturn in most regions. In Asia in particular, economies began to grow markedly during the second quarter. The Riksbank's forecast for growth in the world economy was revised up slightly both for 2009 and for the coming years. However, the world economy was nevertheless expected to shrink by approximately 1 per cent in 2009, a very weak economic development in historical terms (see Figure 2:19).

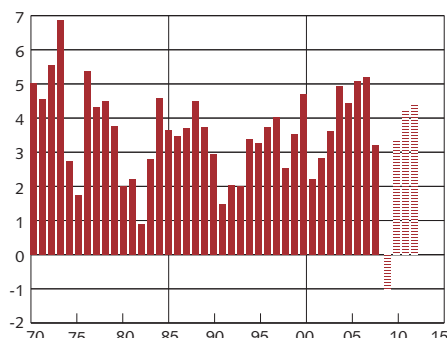
Newly-received data concerning the Swedish economy showed that it was possible to see some signs of a recovery. Among other information, the purchasing manager index indicated that the situation in manufacturing industry had steadily improved. However, many indicators still remained far below their normal levels. The National Institute of Economic Research's Business Tendency Survey for August showed, for instance, that companies in the private service sector and the manufacturing industry still stated that, in their view, the economic situation was very weak. However, according to the Consumer Tendency Survey, households had become more optimistic with regard to the future. The retail trade and car sales also pointed to positive developments over the summer.

Swedish indicators largely followed the same development as indicators in other countries, although for instance the purchasing managers' index had risen slightly more quickly in Sweden in recent months. All in all, the indicators for development during the third quarter suggested that the recovery could arrive somewhat sooner than had been expected in July. At the same time, resource utilisation was very low and the development of the labour market was weak.

The annual percentage change in the CPI for July was -0.9 per cent. This low outcome was primarily due to mortgage rates falling more than expected. In September, the annual percentage change in the CPI amounted to -1.6 per cent, while CPIF inflation amounted to 1.4 per cent. The outcome for CPI and CPIF was slightly lower than forecast by the Riksbank. According to the Riksbank's forecasts in September and October, underlying inflation measured as the CPIF would lie at just below 2 per cent in 2009–2012. CPI inflation would rise rapidly, amounting to just below 4 per cent towards the end of the forecast period (see Figure 2:20). The explanation for this was that mortgage rates would stop falling and start to rise again when the Riksbank started to increase the repo rate.

The Riksbank decided to leave the repo rate unchanged at 0.25 per cent at the monetary policy meetings in September and

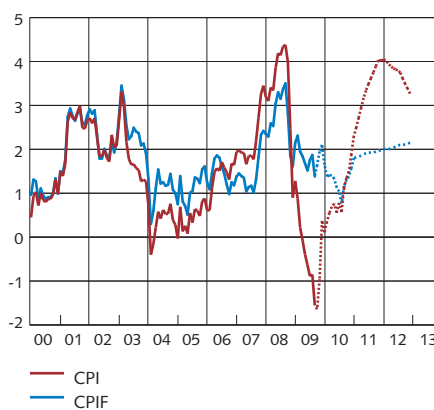
Figure 2:19. GDP in the world
Annual percentage change



Note. Striped bars refer to the Riksbank's forecast in Monetary Policy Report October.

Sources: The IMF and the Riksbank.

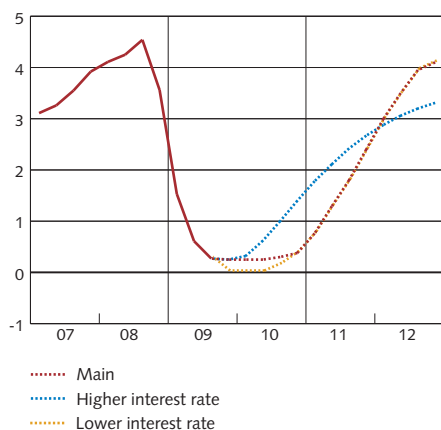
Figure 2:20. CPI and CPIF
Annual percentage change



Note. The CPIF is the CPI with a fixed interest rate. The broken line refers to the Riksbank's forecast in Monetary Policy Report October.

Sources: Statistics Sweden and the Riksbank

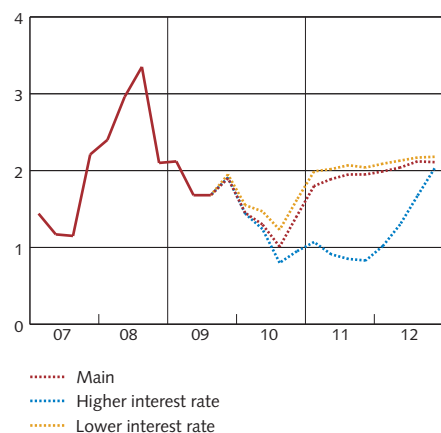
Figure 2:21. Alternative repo rate forecasts
Per cent, quarterly averages



Note. The broken line refers to the Riksbank's forecast in Monetary Policy Report October.

Sources: Statistics Sweden and the Riksbank

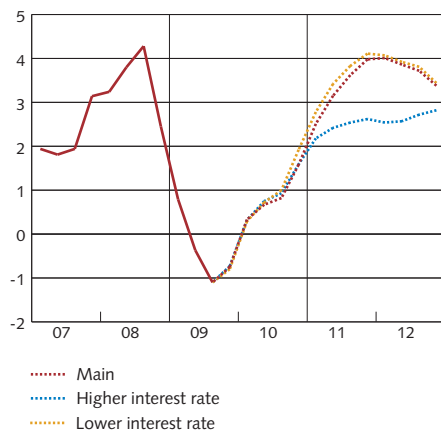
Figure 2:22. CPIF
Annual percentage change



Note. The broken line refers to the Riksbank's forecast in Monetary Policy Report October.

Sources: Statistics Sweden and the Riksbank

Figure 2:23. CPI
Annual percentage change



Note. The broken line refers to the Riksbank's forecast. No forecasts for the CPI based on the alternative repo rate paths were published in the Monetary Policy Report October. These forecasts have been calculated afterwards.

Sources: Statistics Sweden and the Riksbank

October (see Figure 2:4). The repo rate was judged to need to remain at this low level until the autumn of 2010 to support the recovery of the Swedish economy and to achieve the inflation target. Furthermore, the Riksbank assessed that supplementary measures would still be needed for monetary policy to have the intended effect. Consequently, at both meetings, the Riksbank decided to offer further loans of up to SEK 100 billion to the banks at a fixed interest rate and with a maturity of approximately twelve months. This would contribute towards continued low interest rates on loans to companies and households (see the box "The Riksbank's complementary measures"). The low repo rate, together with the economic upturn abroad, was expected to contribute to positive GDP growth in Sweden towards the end of the year. At the same rate as economic activity recovered, the repo rate would be increased relatively rapidly to more normal levels during 2011 and 2012.

At both meetings, Deputy Governors Lars Nyberg and Barbro Wickman-Parak supported the decision to hold the repo rate unchanged at 0.25 per cent. However, they entered reservations against the growth forecasts in both the Monetary Policy Update and the Monetary Policy Report and thereby the repo rate path. They motivated their stances by stating, for instance, a more positive view of how developments in the financial markets could affect economic activity both in Sweden and abroad. Their opinion was that the interest rate would need to be raised slightly earlier than foreseen in the majority's forecast. Nor did they consider, at either occasion, that the economy needed to be stimulated by further loans to the banks at a fixed interest rate.

At the meeting in October, First Deputy Governor Svante Öberg entered a reservation against a further fixed interest rate loan, given the improved situation on the financial markets and the time to maturity of the loan. However, he supported the decision to hold the repo rate and the repo rate path unchanged.

Deputy Governor Lars E.O. Svensson entered reservations against the decisions at both monetary policy meetings. He advocated a decrease of the repo rate to 0 per cent and a lower repo rate path, so that the repo rate should be held at this level one year ahead. Svensson considered that such a repo rate path would entail a better-balanced monetary policy, with lower unemployment, higher resource utilisation and a CPIF inflation rate closer to the target. This would occur without any problems arising for the functioning of the financial markets or financial stability. In terms of Figure 2:21, Svensson advocated the lower (yellow) repo rate path.

Figures 2:21–2:25 illustrate the alternative forecasts for the repo rate, inflation and resource utilisation discussed at the monetary policy meeting in October. Just as before, the output and labour market gap according to the HP method serves as a measure of resource utilisation.

Repo rate path also held unchanged in December

Recovery from the deep recession continued during the autumn. The situation in the global economy improved, world trade increased and the financial markets functioned better. In addition, growth was strong in Asia during the third quarter. The Riksbank's forecast for growth in the world economy in 2009 and 2010 was therefore revised up slightly in December.

All in all, the indicators for the fourth quarter suggested that GDP growth in Sweden would be slightly stronger, compared with the forecast in October. Contributing to this was the stronger recovery abroad, in combination with expectations of higher domestic demand. Households and companies were more optimistic regarding future developments and consumption increased. Consequently, the GDP forecast for Sweden in 2010 was revised upwards somewhat and economic activity was expected to become stronger at the same rate that exports increased. However, this recovery would be taking place from a very low level, implying that there would be plenty of spare resources in the economy in the following years.

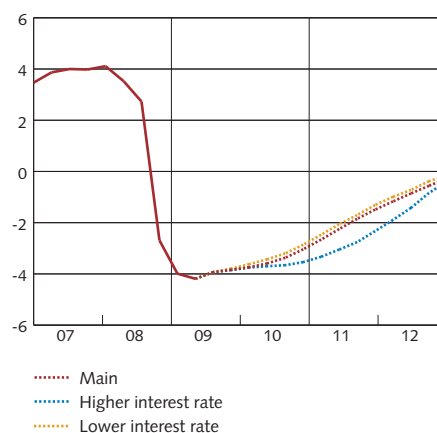
December's assessment indicated that the development of the labour market would be less weak than was forecast in October. However, employment was expected to continue to fall and unemployment to rise during 2010. As a consequence of the weak labour market situation, wages were expected to increase at a slower rate further ahead. This was expected to contribute to low inflationary pressure in the coming years.

At the same time, inflationary pressures were also dampened by lower rents, lower inflation abroad and a stronger krona. Consequently, the inflation forecast for the coming years was revised downwards slightly.

At the Monetary Policy Meeting in December, the Riksbank resolved to leave the repo rate unchanged, at 0.25 per cent. The forecast for the repo rate was also held unchanged. The Riksbank deemed that it would still be appropriate to hold the repo rate at a low level for a longer period of time to support the upturn in production and employment and, at the same time, to reach the inflation target. The Executive Board took no decision regarding new fixed-rate loans.

At the meeting, Deputy Governors Lars Nyberg and Barbro Wickman-Parak supported the decision to hold the repo rate unchanged at 0.25 per cent, but entered reservations against the repo rate path in the Monetary Policy Update. Their stance was motivated with reference to a slightly more positive view of growth prospects and that economic activity is now starting to become normalised. They considered that it would be necessary to raise the interest rate sooner than indicated by the proposed repo rate path, but that the path would then not need to be so steep during the remaining forecast period.

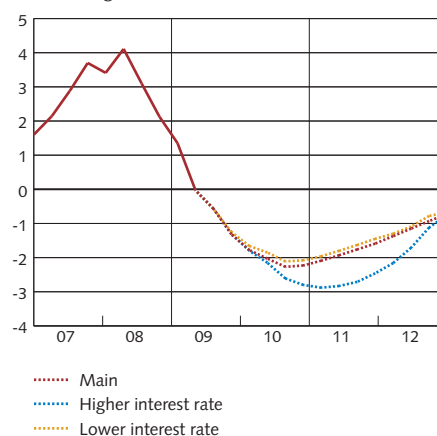
Figure 2:24. Production gap
Percentage deviation from the HP trend



Note. The broken line refers to the Riksbank's forecast in Monetary Policy Report October.

Sources: Statistics Sweden and the Riksbank

Figure 2:25. Labour market gap (hours worked)
Percentage deviation from the HP trend



Note. The broken line refers to the Riksbank's forecast in Monetary Policy Report October.

Sources: Statistics Sweden and the Riksbank

Deputy Governor Lars E.O. Svensson entered a reservation against the decision and advocated cutting the repo rate to 0 per cent and a repo rate path 0.25 per cent below that in the main scenario until the end of the third quarter of 2010. Svensson asserted that such a repo rate path would entail a better-balanced monetary policy, with lower unemployment, higher resource utilisation and a CPIF inflation rate closer to the target, without causing any problems to the functioning of the financial markets or to financial stability.

■ Principles for the evaluation of different monetary policy alternatives

In connection with every monetary policy decision, the Executive Board makes an assessment of the repo rate path needed for monetary policy to be considered to be well-balanced. In the normal case, a well-balanced monetary policy means that inflation is close to the inflation target two years ahead without there being excessive fluctuations in inflation and the real economy. In the event that a conflict of interests arises, for example in which it becomes difficult to bring inflation back on target two years ahead without causing excessive fluctuations in the real economy, the starting point for monetary policy is to reach a reasonable compromise between stabilising inflation and stabilising the real economy.

One way of approaching the issue of which repo rate path is best in a given situation is to compare the forecasts for inflation and the real economy according to alternative repo rate paths. In order to measure the manner in which the real economy is developing, various measurements of resource utilisation are usually examined. The Monetary Policy Reports present the consequences of the alternative interest rate paths in the form of figures illustrating the forecast development of inflation and various measurements of resource utilisation expected to result from a given repo rate path (see Figures 2:5–2:8, 2:14–2:17 and 2:21–2:24).

One method of summarising the information in the alternative scenarios is to estimate the mean squared sums (the mean squared gaps) for the forecasts for inflation and resource utilisation. This method provides a transparent measurement of how effectively an interest rate path can stabilise inflation around the inflation target and resource utilisation around a normal level. The mean squared gaps are calculated as

$$\sum_{\tau=0}^T (\pi_{t+\tau,t} - \pi^*)^2 / (T+1) \quad \text{and} \quad \sum_{\tau=0}^T (y_{t+\tau,t} - y^*_{t+\tau,t})^2 / (T+1)$$

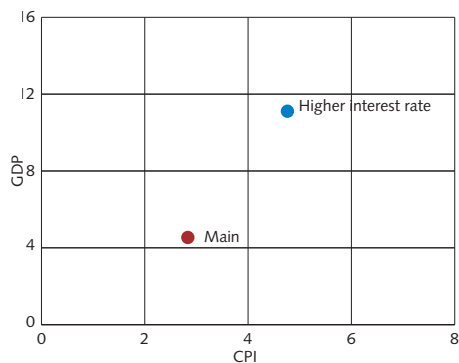
where $\pi_{t+\tau,t}$ is the forecast made in quarter t for inflation in quarter $t+\tau$, π^* is the inflation target, $(y_{t+\tau,t} - y^*_{t+\tau,t})$ is a measurement of resource utilisation and T is the forecast horizon (normally 12 quarters).

The method can be illustrated by examples from the monetary policy meetings in February, July and October. Figures B2–B3, B4–B5 and B6–B7 show the mean squared gaps for the production gap according to the HP method and for deviations in inflation from the inflation target. Inflation is usually measured in terms of the CPI, but, in a situation in which major repo rate changes have very extensive direct effects on the CPI, one should also analyse the effects on CPIX inflation.¹¹ The Figures summarise the information already presented in Figures 2:5–2:8, 2:14–2:17 and 2:21–2:24, but makes it easier

¹¹ The CPI measures the price of a basket of goods and services, including housing costs. Mortgage costs are included in the housing costs. This means that major changes to the Riksbank's policy rate have major transitory effects on inflation measured in terms of CPI. The CPIX – which is the CPI excluding the direct effects of the Riksbank's own repo rate changes – is a measure of underlying inflation that is better suited to study in relation to 2009, when the Riksbank made substantial cuts in its policy rate.

Figure B2. Mean squared gap for CPI and resource utilisation forecasts, February 2009

Mean value of squared deviations during the forecast period

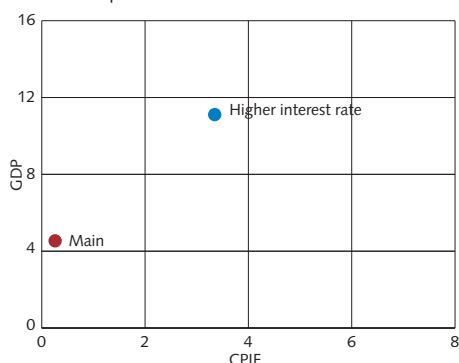


Note. Resource utilisation is measured as GDP's deviation from an HP-trend, and inflation deviation as the deviation from the inflation target of the CPI.

Source: The Riksbank

Figure B3. Mean squared gap for CPIIF and resource utilisation forecasts, February 2009

Mean value of squared deviations during the forecast period

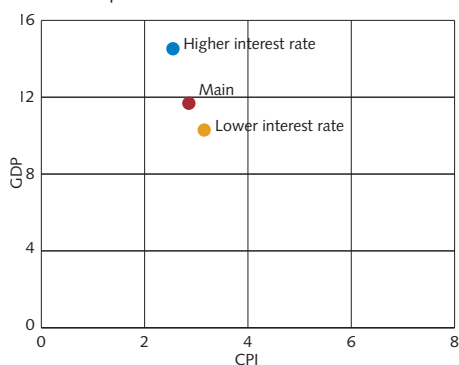


Note. Resource utilisation is measured as GDP's deviation from an HP-trend, and inflation deviation as the deviation from the inflation target of the CPIIF.

Source: The Riksbank

Figure B4. Mean squared gap for CPI and resource utilisation forecasts, July 2009

Mean value of squared deviations during the forecast period



Note. Resource utilisation is measured as GDP's deviation from an HP-trend, and inflation deviation as the deviation from the inflation target of the CPI.

Source: The Riksbank

to compare the different repo rate paths. Two figures are reported for each monetary policy meeting; one where inflation is measured in terms of the CPI and one where it is measured in terms of the CPIIF. A lower mean squared gap for inflation means that inflation is more stable around the inflation target. A lower mean squared gap for resource utilisation signifies more stable resource utilisation. Consequently, the closer a point lies to origo, or 'south-west' in the figure, the smaller are the total deviations for inflation and resource utilisation from the inflation target and a normal level, respectively.

It can be seen from Figure B2-B3 that the lower repo rate path in the Monetary Policy Report from February resulted in a point lying nearer origo in both dimensions. Consequently, according to these calculations, the main scenario's repo rate path resulted in narrower inflation and output gaps than the alternative scenario's repo rate path.

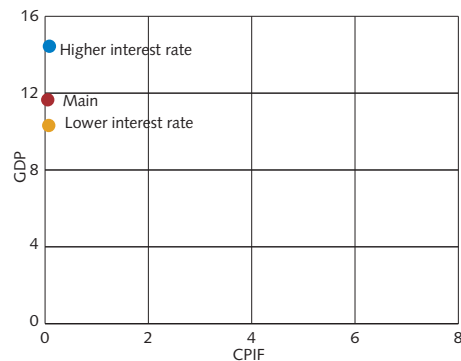
From Figure B4-B5, it can be seen that the lower repo rate path from the alternative scenario in the Monetary Policy Report from July 2009 was closer to origo in the output gap dimension. As regards inflation, the result depends on the inflation measure. Measured in terms of the CPI, the inflation gap is narrowest for the higher repo rate path, but measured in terms of the CPIIF, the inflation gap is approximately equivalent for all three repo rate alternatives.

From Figure B6-B7, it can be seen that the lower repo rate path from the alternative scenario in the monetary policy report from October 2009 was closer to origo in both dimensions when inflation is measured in terms of the CPIIF. When inflation is measured in terms of the CPI, there is no repo rate alternative that can simultaneously minimise both the inflation gap and the output gap.

In both July and October, the majority of the Executive Board deemed that the lower repo rate path was unsuitable. The repo rate had been cut to very low levels, from a historical perspective, and reason existed for a central bank to be cautious with regard to further cuts. It is also the case that it is actually very difficult to make reliable estimates and forecasts of resource utilisation and potential GDP. A particular problem in 2009 was that the financial crisis may have reduced potential production so that resource utilisation in the economy was higher for a given level of production. Furthermore, the Executive Board judged there to be risks linked to exaggerated lending and rapid increases in house prices.

The numerical inflation target has signified great progress for practical monetary policy and made it possible to measure and evaluate the target fulfilment of monetary policy in a much more efficient manner than before. However, the fact that monetary policy is not just directed towards stabilising inflation, but also towards stabilising resource utilisation has, in the absence of quantitative measures of stability in these variables, made it difficult to measure and evaluate target fulfilment in this stability dimension. However, the quantitative measure implied by the mean squared gaps makes it possible to measure and evaluate this target fulfilment. There is a need to closely examine the advantages and disadvantages of the method and work is currently underway within the Riksbank to further develop and fine-tune these methods. The results of this work will successively be reported in the Monetary Policy Report and in the other documents published by the Riksbank.

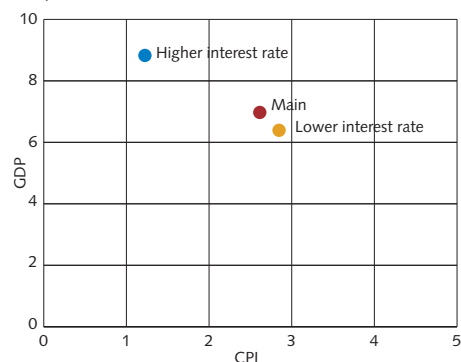
Figure B5. Mean squared gap for CPIF and resource utilisation forecasts, July 2009
Mean value of squared deviations during the forecast period



Note. Resource utilisation is measured as GDP's deviation from an HP-trend, and inflation deviation as the deviation from the inflation target.

Source: The Riksbank

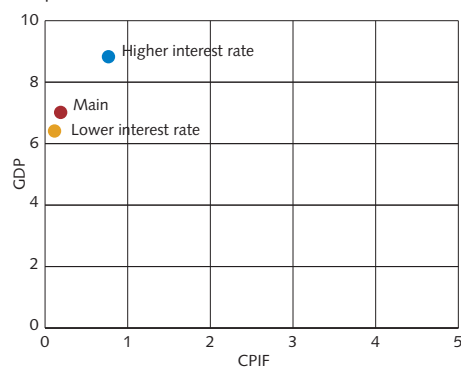
Figure B6. Mean squared gap for CPI and resource utilisation forecasts, October 2009
Mean value of squared deviations during the forecast period



Note. Resource utilisation is measured as GDP's deviation from the HP-trend, and inflation deviation as the deviation from the inflation target.

Source: The Riksbank

Figure B7. Mean squared gap for CPIF and resource utilisation forecasts, October 2009
Mean value of squared deviations during the forecast period



Note. Resource utilisation is measured as GDP's deviation from an HP-trend, and inflation deviation as the deviation from the inflation target.

Source: The Riksbank

■ CHAPTER 3 – Target fulfilment 2009

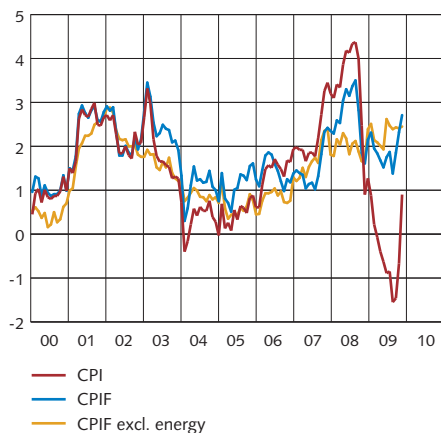
When assessing the Riksbank's monetary policy it is natural to compare the outcomes for inflation with the inflation target. However, there are at least two circumstances that must be taken into account. The first is that it takes time for changes in monetary policy to have an effect on inflation and the real economy. During the time it takes for changes in the interest rate to have a full impact, the economy has time to be

affected by new and unexpected shocks. Inflation and the development of the real economy in 2009 may thus have been affected by shocks that it was not possible to predict when the earlier monetary policy decisions were taken. The second is that monetary policy may also have taken into account the development of the real economy. A deviation between the outcome and the target for inflation may thus be deliberate.

Summary:

- CPI inflation averaged -0.3 per cent during the year. Measured in terms of the CPIF, which is the CPI excluding the direct effects of the Riksbank's repo rate changes, inflation averaged 1.9 per cent.
- Inflation expectations in the long term were close to 2 per cent, which shows that the public has confidence in the Riksbank's inflation target.
- GDP fell by 4.9 per cent in 2009 and resource utilisation was very low. Unemployment increased and reached 8.3 per cent in 2009.
- The international financial crisis is the most important explanation behind the fall in GDP and the deviations between the outcomes for CPI inflation and the inflation target in 2009. The global recession that followed in the wake of the financial crisis hit hard at the Swedish economy, which is highly dependent on exports. To alleviate the effects of the financial crisis on the Swedish economy, rapid and substantial cuts in the repo rate were required. This pushed down mortgage rates, which in turn led to a substantial fall in the CPI.
- Monetary policy must be based on forecasts of economic developments. However, neither the Riksbank nor other analysts predicted the strength of the global financial crisis and how much it would affect inflation and the development of the real economy.
- An analysis conducted using the Riksbank's structural model shows that the unexpectedly weak economic development abroad drove down both underlying inflation and GDP growth, but that the expansionary monetary policy managed to partly counteract these effects.

Figure 3:1 CPI, CPIF and CPIF excluding energy
Annual percentage change



Source: Statistics Sweden

Inflation 2009

The Riksbank's inflation target is worded so that the annual change in the consumer price index, the CPI, should be 2 per cent. CPI inflation fell rapidly in 2009 (see Figure 3:1), from an annual rate of 1.3 per cent in January to the lowest level of -1.6 per cent in September 2009.

The CPI measures the price of a basket of goods and services, including housing costs. Mortgage costs are included in the housing costs. The prices of the different goods and services in the CPI are weighted together on the basis of their relative proportions of consumption. Goods that are consumed on a large scale are given a greater weighting in the CPI. This means that large and temporary changes in the prices of individual goods and services can have major but transitory effects on CPI inflation. Various measures of underlying inflation are therefore used to assess the development of the more persistent and long-term rate of inflation.

One such measure of underlying inflation that it is particularly appropriate to study in relation to 2009, when the Riksbank made substantial cuts in the repo rate, is the CPIF, which is the CPI excluding the effects of the Riksbank's repo rate changes on mortgage costs. Figure 3:1 shows that the development of the CPIF and the CPIF excluding energy was more stable than that of the CPI in 2009 and was closer to the inflation target.

CPI inflation averaged -0.3 per cent during the year (see Table 3:1). Measured in terms of the CPIF, underlying inflation averaged 1.9 per cent. Reduced mortgage rates thus contributed to a difference between CPI inflation and CPIF inflation of 2.2 percentage points in 2009. Energy prices were also lower on average in 2009 compared to the preceding year. Underlying inflation excluding energy prices (CPIF excluding energy prices) was thus higher than the CPIF. The CPIF excluding energy prices increased by an average of 2.3 per cent.

Table 3:1. Comparison of different inflation measures, annual average
Annual percentage change

	2008	2009	1999-2009
CPI	3.4	-0.3	1.4
CPIF	2.7	1.9	1.8
CPIF excl. energy	2.0	2.3	1.5

Sources: Statistics Sweden and the Riksbank

Inflation expectations 2009

Confidence in the inflation target is fundamental to the Riksbank's efforts to achieve price stability and stable resource utilisation. Confidence in the inflation target helps to ensure that wage formation and price setting are compatible with the target. This is very important to the Riksbank's efforts to achieve price stability.

A high level of confidence in the inflation target also increases the possibilities for monetary policy to stabilise production and

employment. If the economic agents are confident that inflation will be kept stable around the inflation target, monetary policy will not need to react to the same extent when the economy is hit by shocks as it would if there were no confidence in the inflation target.

If inflation expectations as indicated in various surveys are stable and close to the inflation target a few years ahead, this can be interpreted to mean that the public is confident that the Riksbank will achieve its target. On behalf of the Riksbank, TNS Sifo Prospera conducts surveys of inflation expectations among money market agents, employer and employee organisations and purchasing managers in the retail and manufacturing sectors. Figure 3:2 shows average expectations regarding CPI inflation for one, two and five years ahead among all of the participants in the Prospera survey. Inflation expectations five years ahead were close to 2 per cent, which shows that the public has confidence in the Riksbank's inflation target. As can be seen in Figure 3:3, inflation expectations five years ahead have also been relatively well anchored around the inflation target for quite a long time.

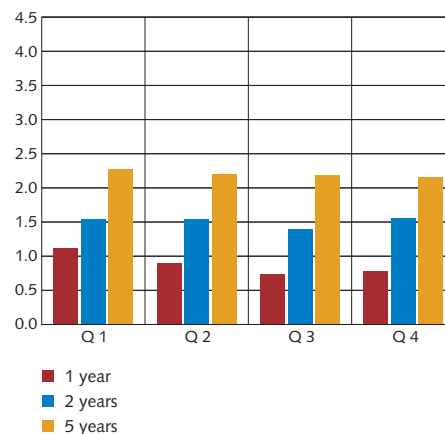
In 2009, inflation expectations one year ahead averaged 0.9 per cent. However, short-term inflation expectations are not strongly linked to public confidence in the inflation target but are based to a higher degree on current actual inflation.¹² The exceptional circumstances that the financial crisis has entailed, with substantial and rapid cuts in the repo rate, have pushed down CPI inflation to unusually low levels. This, together with the severe downturn and the uncertainty that prevails concerning the recovery of the economy, means that it is hardly surprising that short-term inflation expectations are now below the target.

It may also be interesting to compare inflation expectations with the Riksbank's inflation forecasts. If the economic agents share the Riksbank's view of how inflation will approach the target, inflation expectations should be close to the Riksbank's forecasts.

Figure 3:4 shows the Riksbank's inflation forecasts and inflation expectations among money market participants two years ahead as they developed during 2009.¹³ The figure shows that, in 2009, inflation expectations two years ahead were well below the Riksbank's inflation forecasts for 2011. This is a marked difference from the situation in 2008 when the Riksbank's inflation forecasts and the inflation expectations of the money market participants were almost entirely in line with each other. Figure 3:4 also shows that the inflation expectations of the money market participants seem to have been in line with the Riksbank's forecasts for CPI inflation in 2011.

What explains the difference between inflation expectations two years ahead and the Riksbank's CPI forecasts? A large part of the difference can be explained by different perceptions of the repo-rate

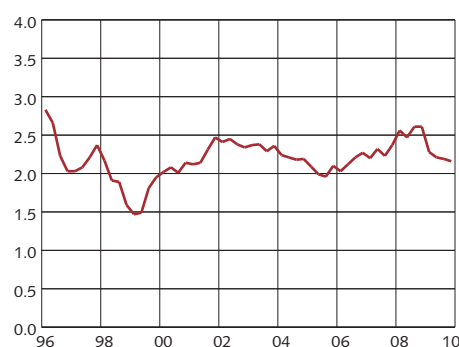
Figure 3:2 All participants' average inflation expectations (CPI) in 2009 1, 2 and 5 years ahead
Annual percentage change



Note. Prospera's survey of inflation expectations in the final quarter was conducted at the end of September and beginning of October 2009. The expectations relate to CPI inflation.

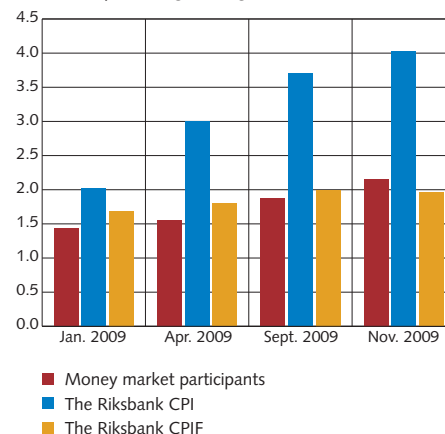
Source: TNS SIFO Prospera

Figure 3:3 All participants' inflation expectations 5 years ahead
Per cent



Source: TNS SIFO Prospera

Figure 3:4 The Riksbank's inflation forecasts and average inflation expectations two years ahead (CPI) among money market participants in 2009
Annual percentage change



Note. The Riksbank's forecasts refer to the most recent forecasts that had been published at the time of Prospera's surveys.

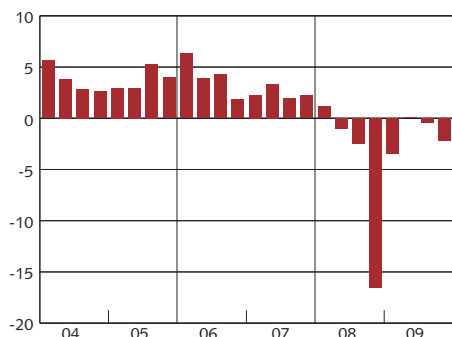
Sources: TNS SIFO Prospera and the Riksbank

¹² See T. Jonsson and P. Österholm, "The Properties of Survey-Based Inflation Expectations in Sweden", Working paper No. 114, 2009, National Institute of Economic Research.

¹³ It is interesting to monitor inflation expectations among money market participants as this group can be assumed to devote more resources to forecasting inflation.

Figure 3:5 GDP

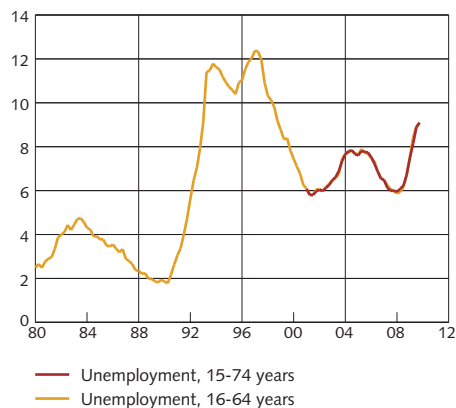
Quarterly change in per cent calculated as an annual rate, seasonally adjusted data



Sources: Statistics Sweden and the Riksbank

Figure 3:6 Unemployment

Percentage of the labour force, seasonally-adjusted data

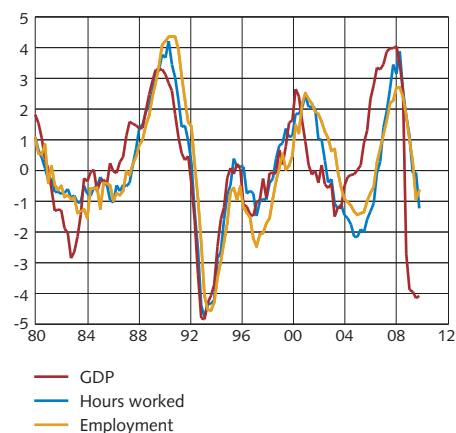


Note. Pre-1993 data has been spliced by the Riksbank.

Sources: Statistics Sweden and the Riksbank

Figure 3:7 Estimated gap

Percentage deviation from the HP trend



Note. These gaps should not necessarily be interpreted as the Riksbank's overall assessment of resource utilisation.

Sources: Statistics Sweden and the Riksbank

path as changes in the repo rate affect mortgage rates, which in turn affect the CPI. In 2009, the money market participants expected a much smaller increase in the repo rate in 2011 than the Riksbank (see Figure 5:6). They thus also expected lower CPI inflation.

Production and employment 2009

The severe downturn that began at the end of 2008 continued in 2009. After having fallen by over 16 per cent in the final quarter of 2008, calculated as an annual rate, GDP fell further by more than 3 per cent in the first quarter of 2009. During the second and third quarters there was zero growth, but in the fourth quarter GDP fell by a further 2.2 per cent (see Figure 3:5).

The reason that Sweden was so hard hit by the global recession is that the Swedish economy is highly dependent on exports. The fall in exports was accompanied by an increase in surplus capacity in the industrial sector and a substantial decline in investments. At the same time, there was a tangible deterioration in the situation on the labour market. The number of redundancy notices increased rapidly at the start of the year and reached very high levels. The number of new job vacancies also fell by half. Average unemployment increased by approximately 2.2 percentage points during the year and amounted to 8.3 per cent in 2009 (see Figure 3:6). Both employment and the number of hours worked fell significantly. The weaker labour market in combination with the sharp decline in wealth in the wake of the falling stock markets also led to a fall in household consumption during the year and to an increase in household saving. Companies also sold from stock to a great extent during the year, thus reducing investments in stock and contributing to the fall in GDP.

Average GDP fell by as much as 4.9 per cent in 2009. This is the greatest fall in GDP in a single year in modern times. In 2008, the fall was 0.2 per cent.

Table 3:2. Production and measures of employment 2008-2009, annual average

Annual percentage change

	2008	2009
GDP, calendar-adjusted	-0.2	-4.9
No. of employed, 15-74	1.2	-2.0
No. of hours worked, calendar-adjusted	0.9	-2.6
Unemployment, 15-74*	6.2	8.3

*Per cent of labour force

Sources: Statistics Sweden and the Riksbank

During the year, the output gap measured using the HP method was -4 per cent, which is approximately the same as the negative gap that arose during the crisis of the 1990s. Other measures of resource utilisation also indicate a large negative gap (Figure 3:7).

Were the deviations from the inflation target the result of a deliberate policy?

As mentioned above, monetary policy can also take into account real developments. A deviation between the outcome and the target for inflation may thus be deliberate. A natural first step in the analysis of the causes of deviations from the inflation target is therefore to investigate whether these may have been deliberate. Was monetary policy in the period 2007-2009 designed in such a way that it entailed forecasts for CPI inflation that were below the inflation target?

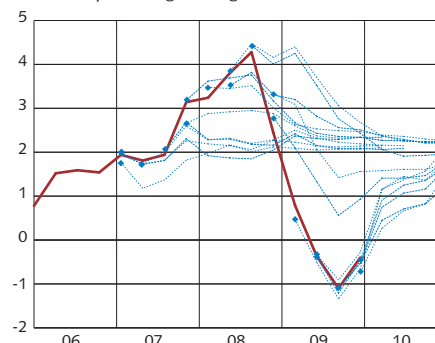
Figure 3:8 shows the actual development of the CPI and the Riksbank's forecasts for the CPI during the period 2007-2009. The unbroken line in the figure shows the actual development of the CPI, while the broken lines show the forecasts that the Riksbank made in each Monetary Policy Report and Update in the period 2007-2009. The first forecast is thus the one presented in Monetary Policy Report 2007:1 and applies to developments from the first quarter of 2007 until the first quarter of 2010, that is to say three years ahead. The second forecast is the one made in Monetary Policy Report 2007:2 and applies correspondingly to developments from the second quarter of 2007 to the end of the second quarter of 2010, and so on.

It is difficult, but also not entirely necessary, to distinguish individual forecasts in the figure. The figure is primarily intended to provide a broad picture of how the Riksbank's assessments have changed and how well the forecasts have predicted actual development.

Up to the autumn of 2008, the global financial crisis had only a fairly limited effect on the Swedish economy. Monetary policy and the repo-rate paths during 2007 and up to the autumn of 2008 entailed CPI forecasts in which inflation in 2009 was predicted to be in line with or slightly above the inflation target (see Figure 3:8). During this period, economic activity and the labour market in Sweden were strong. Although the Riksbank's assessment was that GDP growth would slacken and that employment would increase more slowly in the period ahead, this did not indicate any severe weakening in economic activity. Inflation rose rapidly from the autumn of 2007, and was also expected to be high in 2008. This was primarily explained by increases in commodity, energy and food prices. Furthermore, the Riksbank noted that the underlying inflationary pressures and inflation expectations could also threaten the inflation target in the slightly longer term. The GDP forecasts that were made in 2007 and up to the summer of 2008 entailed a normal GDP growth of between 2 and 2.5 per cent in 2009 (see Figure 3:9).

However, the Riksbank also noted in several Monetary Policy Reports in 2007 and 2008 that there was a risk that weaker international growth could lead to lower inflation and lower interest rates in Sweden. Various alternative scenarios discussed the risk that economic growth in the USA could be weaker as a result of a

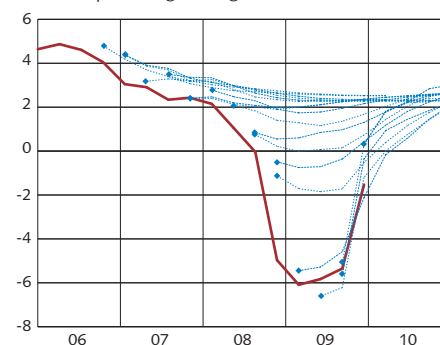
Figure 3:8 CPI, outcomes and forecasts
Annual percentage change



Note. The broken lines represent the Riksbank's forecasts 2007-2009. The blue marks indicate the starting points for the respective forecasts.

Sources: Statistics Sweden and the Riksbank

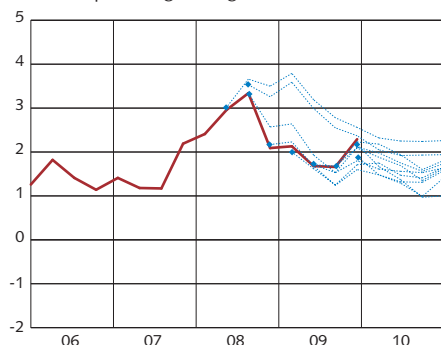
Figure 3:9 GDP growth, outcomes and forecasts
Annual percentage change



Note. The broken lines represent the Riksbank's forecasts 2007-2009. The blue marks indicate the starting points for the respective forecasts.

Sources: Statistics Sweden and the Riksbank

Figure 3:10 CPI, outcomes and forecasts
Annual percentage change



Note. The Riksbank began to publish forecasts for the CPI in the Monetary Policy Report of July 2008. The broken lines represent the Riksbank's forecasts 2008–2009. The blue marks indicate the starting points for the respective forecasts.

Sources: Statistics Sweden and the Riksbank

continued fall in housing prices or because of greater anxiety on the financial markets.

The situation changed dramatically following the bankruptcy of Lehman Brothers in September. Expectations of a rather gentle downturn in economic activity rapidly changed to a much gloomier outlook. To meet the inflation target over time and to alleviate the effects of the financial crisis on the real economy, the Riksbank made rapid and substantial cuts in the repo rate. Without such reductions, the fall in GDP would have been even greater and resource utilisation even lower. The cuts would also lead to reduced mortgage rates which in turn would push down CPI inflation. The forecasts for CPI inflation were therefore revised downwards significantly.

The fact that CPI inflation in 2009 was far below the target can thus be seen as the result of a deliberate monetary policy from the autumn of 2008. The repo rate cuts were made to dampen the fall in production and employment and to keep underlying inflation up at a level close to the inflation target in the full realisation that CPI inflation would be low. Underlying inflation measured in terms of the CPIF was close to the target in 2009 (see Figure 3:10). In the longer term, however, the repo rate cuts will help to keep CPI inflation up in line with the target.

Did the financial crisis come as a surprise to everyone?

The international financial crisis is the explanation behind the fall in GDP and the deviations between the outcomes for CPI inflation and the inflation target in 2009. Was there a forecaster that predicted this development before any of the others?

The turmoil on the financial markets has been part of the picture and has influenced monetary policy and the forecasts since 2007. But the fact that the situation worsened so dramatically as it did in autumn 2008 was nevertheless a surprise. Neither the Riksbank nor other forecasters predicted the strength of the global financial crisis and how much it would affect inflation and the development of the real economy.

Figure 3:11 shows the forecasts for average CPI inflation in 2009 made by various forecasters during 2008 and 2009.¹⁴ The figure is interpreted as follows: Each mark represents a particular inflation forecast. The red marks show the Riksbank's forecasts, while the blue marks show the forecasts made by a number of other forecasters. It is possible to see how high an inflation rate a forecaster has predicted by looking at the vertical axel, while the horizontal axel shows when

¹⁴ The analysis is based on data gathered by the National Institute of Economic Research. One advantage of these data is that they show exactly when the forecasts were made. The forecast comparison covers ten forecasting institutions and their whole-year forecasts for GDP growth, the CPI and the unemployment rate. In addition to the Riksbank, the ten forecasting institutions are: the Swedish Ministry of Finance, the Swedish Retail Institute, the National Institute of Economic Research, the Swedish Trade Union Confederation (LO), Nordea, SEB, Svenska Handelsbanken, the Confederation of Swedish Enterprise and Swedbank.

the forecast was made. The dotted line in the figure shows the actual outcome for CPI inflation in 2009.

Figure 3:11 shows that the pattern is roughly the same for all the forecasters. During the first half of 2008, most forecasters expected that inflation would be between 2 and just below 3 per cent in 2009, while the actual outcome was -0.3 per cent. The explanation for this overestimation is that the forecasters did not foresee that the financial crisis would take such a dramatic turn in the autumn of 2008 and, consequently, that inflation would fall so quickly as a result of the Riksbank's repo rate cuts. Once the dramatic downturn in economic activity that followed in the wake of the financial crisis had begun, all of the forecasters revised their forecasts downwards quickly and substantially. From the beginning of 2009, the forecasts were gathered around the actual outcome.

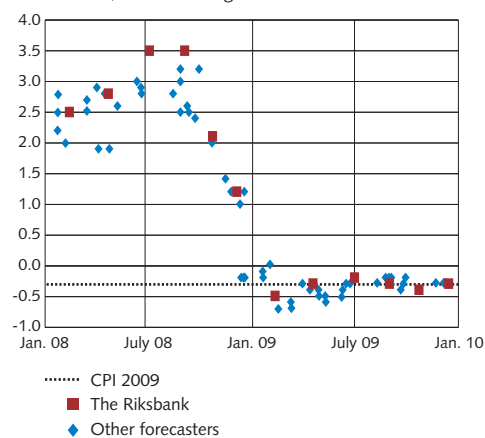
It can be noted that the Riksbank overestimated the outcome for inflation in 2009 to approximately the same extent as the average for other forecasters, although with the exception of July and September 2008 when the Riksbank's forecasts overestimated the prospects for inflation to a higher degree than other forecasters. In July and September 2008, the Riksbank attached great importance to the fact that energy prices had increased more than expected during the spring, which led to inflation reaching just over 4 per cent in the summer of 2008. The Riksbank thus saw a risk that the substantial increases in the prices of food and oil would also lead to rapid increases in other prices. Unusually high inflation expectations also contributed to the Riksbank's assessment.

Figure 3:12 shows the forecasts for GDP growth in 2009 made by various forecasters in 2008 and 2009. In this case, too, it is clear that the forecasts follow a common pattern. Initially, all the forecasters tended to overestimate GDP growth in 2009. During the first half of 2008, they estimated on average that growth in 2009 would be approximately 2 per cent. As it appeared that the financial turmoil would dampen growth in both Sweden and abroad, the GDP forecasts were gradually revised downwards. After April 2009, many of the forecasts were gathered around the actual outcome for GDP growth, which was -4.9 per cent. However, most of the forecasters revised their forecasts upwards towards the end of the year and were thus surprised by the lower outcome.

The Riksbank made approximately the same overestimation as the average of the other forecasters. The Riksbank, like the other forecasters, also continued to overestimate GDP growth for 2009 even during the first quarter of 2009. In other words, no forecaster predicted the economic downturn sooner than any other.

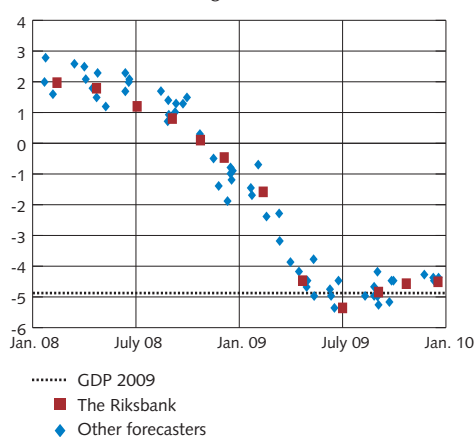
As monetary policy is based on forecasts it is important that the Riksbank's forecasts are reasonably accurate. The Riksbank's general forecasting performance is analysed in Chapter 4.

Figure 3:11 Forecasts of CPI inflation 2009
Per cent, annual average



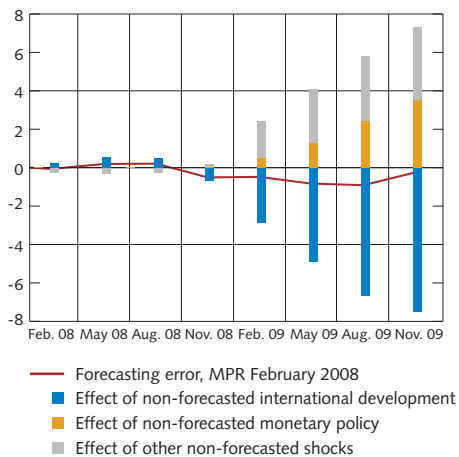
Note. Other forecasters refers to those listed in footnote 14.
Sources: National Institute of Economic Research, Statistics Sweden and the Riksbank

Figure 3:12 Forecasts for GDP growth 2009
Per cent, annual average



Note. Other forecasters refers to those listed in footnote 14.
Sources: National Institute of Economic Research, Statistics Sweden and the Riksbank

Figure 3:13 CPIF: Forecasting errors and the effects of unexpected shocks
Annual percentage change



Note. In the Monetary Policy Report of February 2008, forecasts were only made for the CPI and the CPIX. The CPIX is calculated as the CPI excluding household mortgage costs and the direct effects of changes in indirect taxes and subsidies. The CPIF of Figure 3:13 has been calculated using the CPIX forecast in the Monetary Policy Report of February 2008.

Source: The Riksbank

How great an impact did monetary policy have on inflation and the real economy in 2009?

At the end of 2008, monetary policy was significantly changed to counteract the effects of the financial crisis on the economy. How great was the impact of this change?

The Riksbank has for some years now used a general equilibrium model of the Swedish economy. The model tries to explain the developments and interplay in the entire economy and not just a particular part, for instance, private consumption or the labour market. The model is primarily used to make forecasts and calculations of the effects of monetary policy.¹⁵ However, the model can also be used to analyse how unexpected shocks can help to explain various forecasting errors (deviations between forecasts and outcomes). The major shocks that hit the Swedish economy at the end of 2008 meant that the outcomes for inflation and the real economy were much weaker than previously forecast by the Riksbank. With the help of the model, we can calculate what impact the expansionary monetary policy conducted since the end of 2008 has had in terms of counteracting these shocks. We can also calculate how much the unexpectedly weak macroeconomic development abroad has affected the forecasting errors for inflation and the real economy.

A natural starting point for the analysis of forecasting errors is provided by the forecasts made in early 2008. Figures 3:13 and 3:14 show the results of such an analysis in which the model has been used to calculate how large a part of the forecasting errors can be related to weaker development abroad (lower GDP growth, lower inflation and lower interest rates abroad), a more expansionary monetary policy or other factors. The forecasting errors are measured as the deviation between the forecasts for underlying inflation (CPIF) and GDP as forecast in the Monetary Policy Report published in February 2008 and the actual development of both variables. The unbroken red curves in the figures show the forecasting errors. When the curve is above zero this means that the outcome was higher than forecast, while the opposite is the case when the curve is below zero. For example, underlying inflation during the second and third quarters of 2009 was approximately one percentage point lower than forecast in the Monetary Policy Report of February 2008. The bars show how various unforeseen events contribute to explaining the forecasting errors. The blue bars show the isolated effect of development abroad being weaker than expected. Similarly, the yellow bars show the isolated effect of the monetary policy conducted being different from the policy that was forecast. The grey bars show the overall effect of

¹⁵ For a detailed description of the model see, for example, M. Adolfson, S. Laséen, J. Lindé and M. Villani, "RAMSES – A new general equilibrium model for monetary policy analysis", *Sveriges Riksbank Economic Review*, No. 2, 2007.

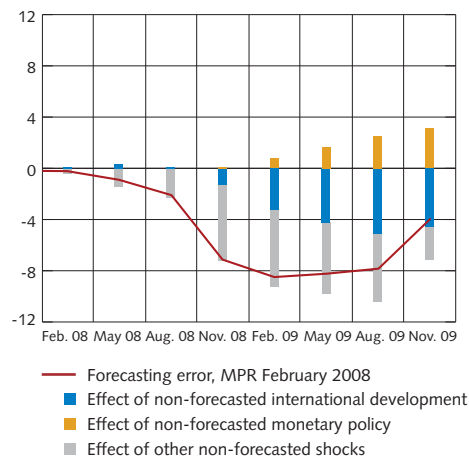
all other unexpected shocks. As it is difficult to distinguish the isolated effects of each of these they have been combined to form one single bar.

As can be seen in Figure 3:13, the forecasting error for underlying inflation in 2009 was relatively small. This is despite the fact that the weak macroeconomic development abroad, according to the model's interpretation, should have led to a large negative forecasting error (blue bars).¹⁶ This is partly explained by the fact that monetary policy has been much more expansionary than was forecast in the Monetary Policy Report of 2008 (yellow bars), but other shocks have also helped to push up underlying inflation (grey bars). One such important shock relates to changes in the nominal exchange rate which since the autumn of 2008 has weakened more than can be explained by weak international demand and the expansionary monetary policy. This is probably because small currencies like the Swedish krona often weaken to a relatively greater extent when there is turbulence on the financial markets. In Sweden's case, the concern over developments in the Baltic countries has also probably contributed to a weakening of the krona.

Figure 3:14 shows how the unexpectedly weak development abroad (blue bars) contributed to a significant forecasting error for GDP in 2009. It appears, however, that other shocks (grey bars) were equally important. These include shocks that led to investments and household consumption falling more than can be explained by developments abroad. Several factors have contributed to this. For instance, the weak situation on the labour market and the general uncertainty about the development of the economy have led the households to save an increasing proportion and have had a negative effect on corporate investments. The weak development of investments may also be due to the fact that access to funding has become more difficult for the companies. The figure also shows how the expansionary monetary policy (yellow bars) has dampened the fall in GDP and counteracted the negative shocks. The Riksbank's repo rate cuts from the autumn of 2008 to the summer of 2009 have thus helped to mitigate the effects of the financial crisis on the real economy. Without these substantial reductions in the repo rate, GDP would have fallen even more.

In conclusion, it is worth mentioning that it is difficult to distinguish between the different driving forces behind the forecasting errors. This model analysis contains a number of specific assumptions, which naturally can be discussed. If other assumptions were used, the bars in Figures 3:13 and 3:14 would look different. For instance, Swedish variables such as consumption and investment could be affected to a greater degree by developments abroad, if the model had more channels to reflect the effects of the international financial crisis on the Swedish economy.

Figure 3:14. GDP growth: Forecasting errors and the effects of unexpected shocks
Annual percentage change



Source: The Riksbank

¹⁶ In the model, international macroeconomic development is reflected in terms of average CPI inflation, GDP and policy rates for Sweden's most important trading partners (TCW weighted).

■ CHAPTER 4 – Forecasting performance

As monetary policy is based on forecasts it is important that the Riksbank's forecasts are reasonably accurate. In practice, on way of assessing whether the Riksbank's forecasts are good enough is to compare them with the forecasts of other analysts. Relatively long periods of examination are necessary to be able to say anything more definite about the accuracy of forecasts. A fair

comparison of the accuracy of different forecasts should also take into account the fact that the forecasts are made at different points in time and that different forecasters therefore do not have the same information available to them. In the comparison of forecasts carried out in this report a method has been used that corrects for such differences so that the forecasts are comparable.

Summary:

- CPI inflation in 2009 was well below the forecasts that the Riksbank and other forecasters made in 2008 but close to the forecasts made in 2009. The rapid and substantial repo rate cuts in 2008 and 2009 are the most important reason for this.
- The Riksbank, like other forecasters, significantly overestimated both GDP growth and the repo rate level in their forecasts in 2008 and early 2009.
- In order to be able to draw conclusions about the general forecasting performance of a forecaster one should study accuracy over a long period of time. In the period 1999-2009, the accuracy of all the forecasters was much worse than in the period 1999-2008. This reflects the major shocks that hit the economy from the autumn of 2008 and the uncertainty that then prevailed rather than a decline in forecasting performance.
- The Riksbank's forecasts for the CPI and the repo rate were slightly less accurate than those of other forecasters. This was because on two occasions, in July and September 2008, the Riksbank overestimated CPI inflation to a higher degree than other forecasters. The Riksbank saw a risk that the substantial increases in the prices of food and oil during the spring would also lead to rapid increases in other prices. Unusually high inflation expectations also contributed to this view of potential risk. The overestimation of CPI inflation also meant that the repo rate path was overestimated on these two occasions.

How accurate are the forecasts?

One means of obtaining a comprehensive measure of a forecaster's accuracy is to calculate the average forecasting error, that is, to check how much the forecasts have on average deviated from the final outcome.¹⁷ However, the average error says nothing about how forecasting errors vary; positive forecasting errors cancel out negative forecasting errors. It is therefore common to also calculate the average absolute forecasting error.¹⁸ These comprehensive measures can then be used to compare different forecasters.

One difficulty with this type of comparison is that different forecasters make their forecasts at different points in time. This means that the forecasts are based on different amounts of information. For instance, some forecasters, but not others, may have been able to take into account a recently-published figure for GDP or CPI in their forecasts. A forecaster that regularly publishes its forecasts later than others will on average be able to base its forecasts on a larger amount of information – and on average have a shorter forecast horizon – than other forecasters.

The Riksbank has worked out a method that takes into account the fact that forecasters have had access to different amounts of information when making their forecasts.¹⁹ This method is based on the assumption that part of a forecaster's average forecasting error can be explained by the length of the forecast horizon. A forecaster that publishes its forecasts later than others – and therefore has a shorter average forecast horizon – can also be expected to have a slightly better accuracy. A direct comparison between different forecasters' average forecasting errors therefore risks being misleading.

The method involves using a statistical method to estimate how much of the forecasting error of each forecaster can be explained by the length of the forecast horizon. The remaining part of the forecasting error, the part that thus does not depend on differences in the length of the forecast horizon, will then be a measure that can be used as a fairer comparison of different forecasters (see the box below for a technical description of the method).²⁰

17 The term 'forecasting error' refers to the difference between outcome and forecast.

18 When calculating the absolute forecasting error, no account is taken of whether the forecasting error is positive or negative; that is the sign of the forecasting error is irrelevant.

19 M. Andersson and T. Aranki, "A comparison of different forecasters' ability given the publication date effect", *Sveriges Riksbank Economic Review*, No.1, 2009.

20 As the Riksbank on average publishes its forecasts slightly later than other forecasters (it has a shorter forecast horizon), the method does not adjust to the Riksbank's advantage.

■ A means of controlling for differences in the amount of information available to different forecasters

Let y_t be the outcome for variable y year t (for example y =GDP growth and t =2009) and assume that the forecast for y is $\hat{y}(h)_{it}$ where h shows how many months prior to the outcome the forecast is published. h is thus a measure of the information available at the time of publication (the lower h is, the shorter the forecast horizon is and the more information is available). i is an index of different forecasters.

Forecaster i 's different forecasting error can thus be defined as

$$(1a) \quad \varepsilon_{it} = y_t - \hat{y}(h)_{it}$$

The absolute forecasting error is defined as

$$(1b) \quad \varepsilon_{it}^{abs} = |y_t - \hat{y}(h)_{it}|$$

The average error (AE_i) for forecaster i is calculated as the average value of its forecasting errors

$$(2a) \quad AE_i = \frac{\sum \varepsilon_{it}}{n_i} \text{ (average error)}$$

where n_i = the number of forecasts made by i . The absolute average error (AAE_i) for forecaster i is calculated as

$$(2b) \quad AAE_i = \frac{\sum \varepsilon_{it}^{abs}}{n_i} \text{ (absolute average error)}$$

The starting point for the Riksbank's calculation method is that the absolute forecasting errors in equation (1b) can be divided up into different components: a component that is due to the amount of information available at the time of publication (the forecast horizon), a component that reflects the different forecasters' general forecasting performance (μ_i) and a component that captures the fact that different years can be more or less difficult to forecast for all forecasters (λ_t).

The absolute forecasting error can thus be divided up as follows:

$$(3) \quad \varepsilon_{it}^{abs} = \alpha h_{it} + \mu_i + \lambda_t + e_{it}$$

By estimating equation (3) using a statistical method (panel data regression) and comparing the estimate of μ_i for the various forecasters it is possible to make a comparison where one has taken into account the fact that forecasters publish their forecasts at

different points in time and thus have access to different amounts of information. The horizon effect is measured using the constant α which is the same for all of the forecasters.²¹

Figures 4:1 to 4:8 show the respective forecasters' adjusted absolute average errors centred around the average absolute error calculated for all the forecasters, that is

$$(4) \quad AAAE_i = \mu_i + \frac{\sum_1^N AAE_j}{N}$$

(adjusted absolute average error)

where N is the number of forecasters. This makes it possible to directly relate differences between forecasters to the size of the forecasting errors.

21 Tests show that the effect of the horizon on the absolute forecasting error does not differ significantly between the various forecasters.

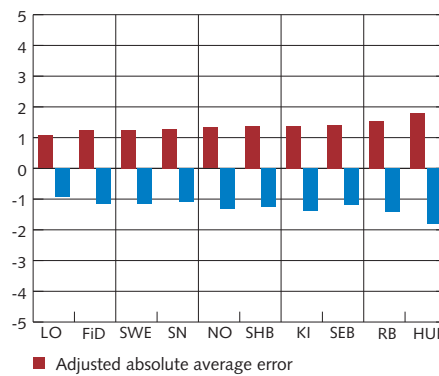
Forecasting errors in the forecasts for 2009

Figures 3:11 and 3:12 in Chapter 3 show that no forecaster predicted the economic downturn that occurred in the autumn of 2008 sooner than any other. In this section, the method described above is used to acquire a comprehensive measure of the forecasting performance for 2009. However, as noted above, chance may have a major impact in individual years. For a more systematic picture of the performance of the various forecasters, a longer period than one year must be studied. This is done in the next section.

Figures 4:1–4:4 illustrate the various forecasters' forecasting errors with regard to the forecasts for 2009. The red bars show the adjusted absolute average error, the measure described above – the absolute forecasting error adjusted for differences in the forecast horizon. The shorter the bar, the smaller the forecasting error and the higher the accuracy of the forecast. The blue bars show the average error, the average forecasting error without corrections. This measure shows whether there are tendencies towards overestimation or underestimation in the forecasts of the various forecasters. If the blue bar is positive, this indicates a tendency towards underestimation; that is on average the outcomes are higher than the forecasts. A negative blue bar indicates a tendency towards overestimation – on average the outcomes are lower than the forecasts.

The forecasts for all variables were much less accurate for all the forecasters in 2009 than in 2008. This reflects the major shocks that hit the economy and the uncertainty that prevailed rather than a decline in forecasting performance. The Riksbank's forecasts for inflation and the repo rate for 2009 were less accurate than those of many other forecasters (see Figures 4:1 and 4:4).

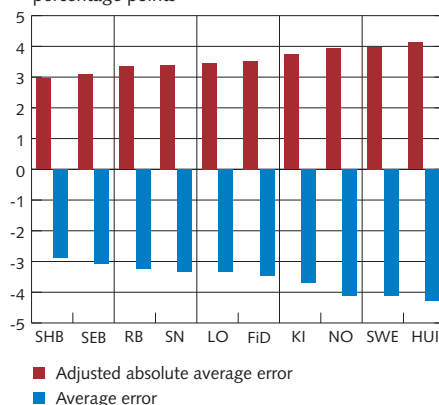
Figure 4.1. Forecasting errors for the CPI of various forecasters 2009
Average error and adjusted absolute average error, percentage points



Note. LO=Swedish Trade Union Confederation, FiD=Ministry of Finance, SWE=Swedbank, SN=Confederation of Swedish Enterprise, NO=Nordea, KI=National Institute of Economic Research, SHB=Svenska Handelsbanken, RB=Riksbank and HUI=Swedish Retail Institute.

Sources: National Institute of Economic Research and the Riksbank

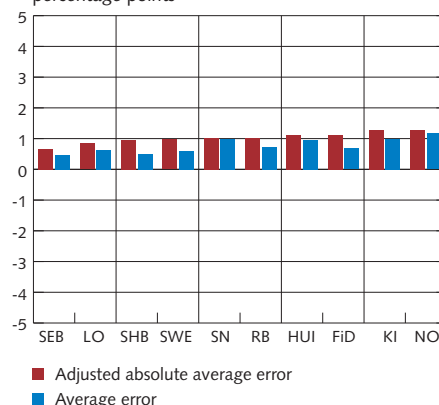
Figure 4.2. Forecasting errors for GDP growth of various forecasters 2009
Average error and adjusted absolute average error, percentage points



Note. See the note to Figure 4.1 for an explanation of the abbreviations.

Sources: National Institute of Economic Research and the Riksbank

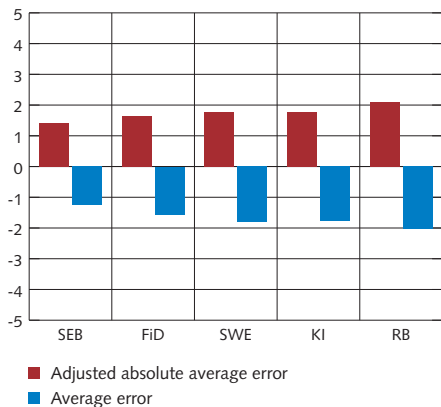
Figure 4.3. Forecasting errors for unemployment of various forecasters 2009
Average error and adjusted absolute average error, percentage points



Note. See the note to Figure 4.1 for an explanation of the abbreviations.

Sources: National Institute of Economic Research and the Riksbank

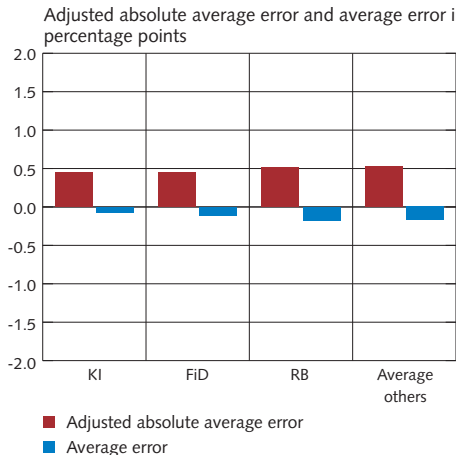
Figure 4.4. Forecasting errors for the repo rate of various forecasters 2009
Average error and adjusted absolute average error, percentage points



Note. FiD=Ministry of Finance, SWE=Swedbank, KI=National Institute of Economic Research and RB=Riksbank.

Sources: National Institute of Economic Research and the Riksbank

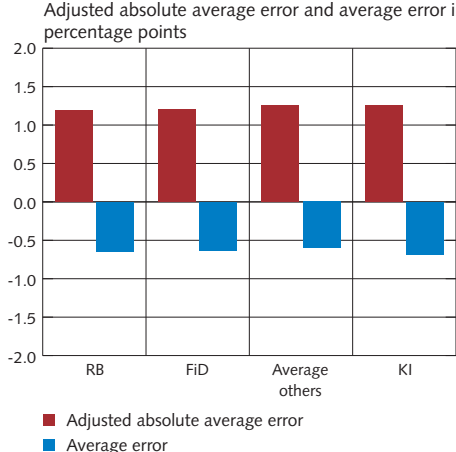
Figure 4.5. Accuracy of the forecasts for CPI of various forecasters 1999-2009
Adjusted absolute average error and average error in percentage points



Note. KI=National Institute of Economic Research, FiD=Ministry of Finance and RB=Riksbank. The other forecasters are listed in footnote 14.

Sources: National Institute of Economic Research and the Riksbank.

Figure 4.6. Accuracy of the forecasts for GDP growth of various forecasters 1999-2009
Adjusted absolute average error and average error in percentage points



Note. See the note to Figure 4.5 for an explanation of the abbreviations.

Sources: National Institute of Economic Research and the Riksbank

The accuracy of the forecasts for the period 1999–2009

Figures 4:5–4:8 show the average errors and the adjusted absolute average errors for the period 1999–2009. The major forecasters – the Swedish Ministry of Finance, the National Institute of Economic Research and the Riksbank – are reported individually, while the others are reported as an average. It may be worth noting that the Riksbank's forecasts up to the third Inflation Report of 2005 were based on the assumption of an unchanged repo rate during the forecasting period.²² This has probably undermined accuracy somewhat.

It is important to emphasise that there is relatively great uncertainty here too and it is difficult to find significant differences between the forecasters. One explanation for this is probably that different forecasters' forecasts tend to follow one another relatively well, as indicated by Figures 3:11–3:12.

The forecasting performance of all the forecasters was poorer in the period 1999-2009 than in the period 1999-2008 (see Table 4:1). The adjusted absolute forecasting errors were thus relatively speaking greater in 2009 with regard to the variables presented here. Given the major shocks that occurred during the year however, it is not particularly surprising that the forecasts were less accurate.

Table 4:1. Accuracy of the forecasts

Adjusted absolute average error in percentage points

	CPI		GDP		Unemployment	
	1999-2008	1999-2009	1999-2008	1999-2009	1999-2008	1999-2009
The Riksbank	0.38	0.51	0.81	1.19	0.37	0.44
Ministry of Finance	0.37	0.45	0.82	1.20	0.38	0.45
National Institute of Economic Research	0.34	0.45	0.85	1.26	0.32	0.42
Others (average)	0.45	0.53	0.89	1.25	0.4	0.45

Sources: National Institute of Economic Research and the Riksbank

Taken together, Figures 4:5–4:7 show that the Riksbank, just like other forecasters, has tended to overestimate CPI inflation and GDP growth and to underestimate unemployment during the period 1999-2009.

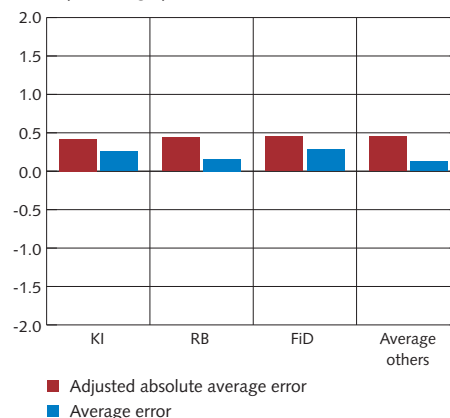
With regard to forecasts of the repo rate it is still too soon to assess the forecasting performance of the Riksbank as it has only published repo rate forecasts for three years. With such a short assessment period, chance plays too large a role to make it meaningful to draw any general conclusions about forecasting performance. Figure 4:8 nevertheless shows the accuracy of the

²² In 2007 the Inflation Report was renamed the Monetary Policy Report.

forecasts for the repo rate in the period 2007-2009 for those forecasters that publish such forecasts.²³

On average for the three years, all of the forecasters have tended to overestimate the repo rate, but the Riksbank has the largest forecasting error of the five forecasters. The primary contribution to the Riksbank's relatively large forecasting error over the period is made by the overestimates in the forecasts for the repo rate (and CPI inflation) produced in July and September 2008 (see Figure 3:11). On these occasions, the Riksbank's forecasts overestimated the prospects for inflation to a greater degree than those of other forecasters. As mentioned previously, in July and September 2008 the Riksbank attached great importance to the fact that energy prices had increased more than expected during the spring, which led to inflation reaching just over 4 per cent in the summer of 2008. The Riksbank thus saw a risk that the substantial increases in the prices of food and oil would also lead to rapid increases in other prices. Unusually high inflation expectations also contributed to this assessment.

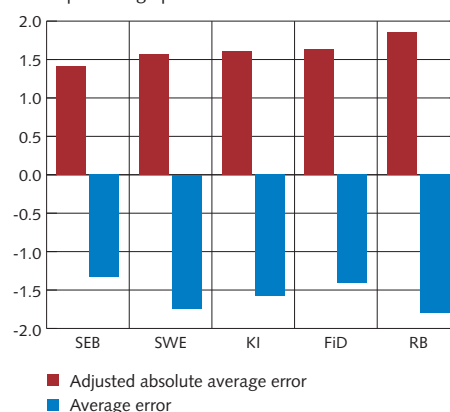
Figure 4:7. Accuracy of the forecasts for unemployment of various forecasters 1999-2009
Adjusted absolute average error and average error in percentage points



Note. See the note to Figure 4.5 for an explanation of the abbreviations.

Sources: National Institute of Economic Research and the Riksbank

Figure 4:8. Accuracy of the forecasts for the repo rate of various forecasters 2007-2009
Adjusted absolute average error and average error in percentage points



Note. Forecasts of the repo rate were not published prior to 2007.

Sources: National Institute of Economic Research, Ministry of Finance, SEB, Swedbank and the Riksbank

²³ While other forecasters present their interest rate forecasts as a value at the end of the year, the Riksbank presents its repo rate forecasts as quarterly average values. In order to make the comparison possible, the Riksbank's quarterly forecasts have been converted to daily values. However, this does not effect the result.

■ CHAPTER 5 – Implementation of monetary policy

If monetary policy is predictable, market participants will be able to predict how new information regarding the development of the economy will impact the Riksbank's rate setting. Market rates can thus adjust themselves before the Riksbank has even made a decision on the repo rate and repo rate path. This can contribute towards a more rapid impact of monetary policy than would otherwise have been the case. This section presents an account of whether the actual repo rate decision was expected, as well as how closely the market's expectations of the development of the repo

rate have corresponded with the Riksbank's own repo rate path. In normal cases, minor deviations should be present between the market's expectations and the Riksbank's forecast. However, there are a number of technical and other, more fundamental, reasons for larger differences to arise. Among the latter can be counted disunity among the Executive Board on the repo rate path, that the market may have a different view of the economic development and, quite simply, the market's lack of belief that monetary policy will actually follow the published path.

Summary:

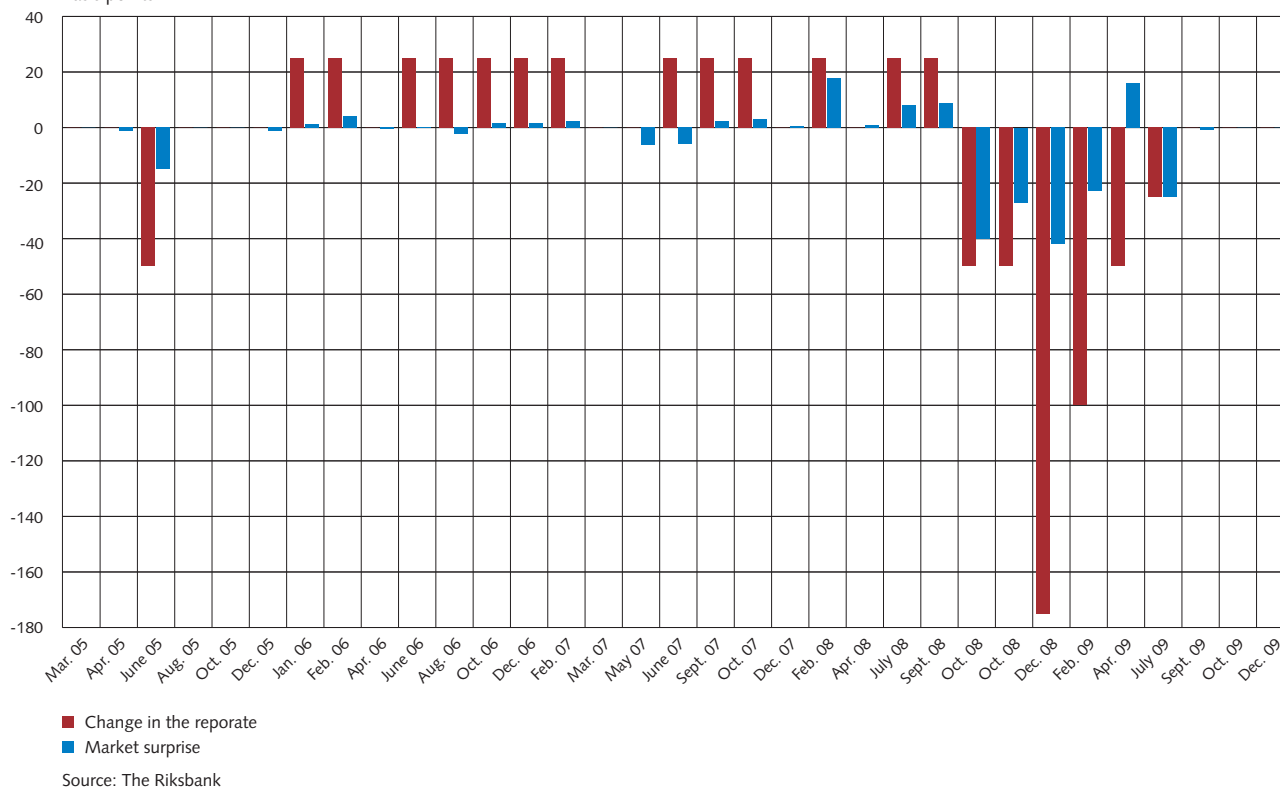
- Until autumn 2008, the market was able to predict the Riksbank's repo rate decisions very accurately.
- In 2007 and 2008, the market's expectations of the repo rate's development were, in principle, in line with the Riksbank's published repo rate paths both before and after the publication of the Riksbank's repo rate forecasts.
- From the autumn of 2008 until the summer of 2009, the Riksbank's repo rate decisions were less predictable. Although market participants were certainly expecting repo rate cuts during this period, the cuts were greater than expected. This may partially be due to a number of technical and other, more fundamental, reasons. However, this is probably also due to the fact that the international crisis impacting the Swedish economy in the autumn of 2008 was the worst for 50 years and that market participants thus did not have the benefit of previous experience when attempting to predict the Riksbank's reactions. Consequently, it is not surprising that there prevailed uncertainty regarding how rapidly and forcefully the Riksbank would react. As of the autumn of 2009, the market has been able to fully predict repo rate decisions.
- During 2009, there were occasional major differences between the Riksbank's repo rate path and the market's expectations of the development of the repo rate.
- The market's expectations of the development of the repo rate approached the Riksbank's repo rate forecast at the end of the year.

Were the Riksbank's repo rate decisions predictable?

This section compares the Riksbank's repo rate decisions with the market's expectations ahead of each monetary policy decision. If the deviations were minor, this can be interpreted as meaning that the repo rate decisions were predictable. The opposite applies if the deviations were major.

Figure 5:1 presents a comparison of changes in the repo rate with the market's expectations of repo rate during the years 2005 – 2009.²⁴ The red bars indicate the extent of changes in the repo rate, together with their direction, measured as basis points. The blue bars indicate the difference between the actual change in the repo rate and the change expected by the market. If the blue bar is at zero or almost zero, this means that the market was not surprised by the interest rate decision. When the repo rate is increased, a positive blue bar indicates that the Riksbank increased the repo rate above the market's expectations. The opposite is true when the blue bar is

Figure 5:1. Change in the repo rate and market surprise
Basis points



Source: The Riksbank

²⁴ Surprise in the market is measured as the change in the 1-month interest rate on the interbank market (the change in the interest rate for a 1-month interest-rate swap in which a fixed interest rate can be exchanged for a variable interest rate over night (O/N) for one month (1-month STINA swap)). As this interest rate is based on the average overnight rate one month ahead, an unexpected change in the repo rate will lead to an adjustment of the 1-month rate to correspond to the new repo rate level. The interest rates from the day of announcement are those prevailing at approximately 10.00, i.e. 30 minutes after the interest rate decision has been announced.

negative. When the repo rate is cut, a positive blue bar indicates that the cut was smaller than the market had expected. The opposite is true when the blue bar is negative.

Until 2008, the market was able to predict repo rate decisions very well. However, from the autumn of 2008 until the summer of 2009, the number of surprises has been higher. In general, it can be said that, during the autumn of 2008 and the spring of 2009, the market participants succeeded in predicting repo rate cuts, but not the extent of these. Figure 5:1 indicates that, during this period, the market expected the repo rate to be cut more gradually. One exception is formed by the monetary policy decision in April 2009, in which the market expected that the repo rate would be cut by 0.75 percentage points to 0.25 per cent, while the Riksbank only cut the repo rate by 0.5 percentage points to 0.5 per cent.

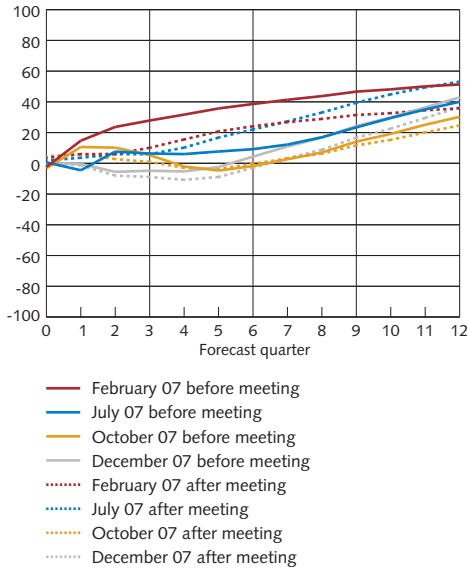
From a historical perspective, it is not surprising that the market generally expected less extensive repo rate cuts, as repo rate changes are normally undertaken in increments of 25 basis points. However, the financial crisis and the severe downturn mean that circumstances can hardly be described as normal. In such an extraordinary situation, it is not surprising that there prevailed some uncertainty regarding how rapidly and forcefully the Riksbank would react. And neither were these circumstances specific to Sweden. There were also many moments of surprise in many other countries. Expectations may also have been affected by the fact that the repo rate was approaching zero and by the prevailing discussion of the wisdom of 'holding fire' in terms of monetary policy. However, from the autumn of 2009, the market has predicted repo rate decisions fully (that is, the repo rate has been held at zero and this was expected by the market, and both red and blue bars measured zero during the three last monetary policy meetings in 2009).

Were the Riksbank's repo rate forecasts predictable?

The Riksbank publishes its own forecast of the development of the repo rate over the three-year forecast period. A published repo rate forecast makes it easier to explain the Riksbank's view of developments and its reasoning to the public and the financial markets when the monetary policy decisions are made. The intention is to make it easier to steer expectations regarding the monetary policy that will be conducted in the future. Expectations of future repo rates affect interest rates with longer maturities which, in turn, are the interest rates that have an impact on the economic decisions of households and companies.

The Riksbank updates its repo rate forecasts at each monetary policy meeting, that is approximately every other month. During this period, new information on the development of the economy may be obtained. If the Riksbank succeeds well in its communication,

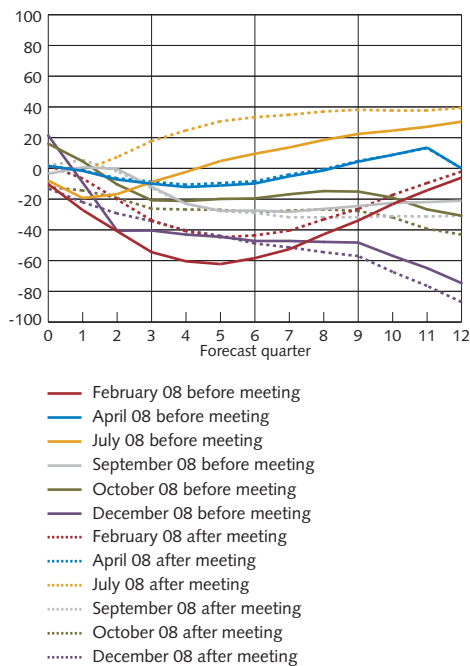
Figure 5.2. Deviation of market expectations from the Riksbank's repo rate forecasts, before and after publication during 2007
Basis points



Note. Forecasts of the repo rate were published for the first time in the Monetary Policy Report February 2007.

Sources: Reuters EcoWin and the Riksbank

Figure 5.3. Deviation of market expectations from the Riksbank's repo rate forecasts, before and after publication during 2008
Basis points



Sources: Reuters EcoWin and the Riksbank

it should be fairly easy for the market participants to predict how this information will affect the Riksbank's repo rate forecasts. This should mean that there will only be minor deviations between the market's expectations on the day preceding publication of a repo rate forecast and the new forecast published by the Riksbank. Similarly, there should normally be small deviations between the market's expectations and the Riksbank's forecast in the days following the Riksbank's publication of a new repo rate forecast. However, there are a number of technical and other, more fundamental, reasons for differences to arise. These are discussed in a later section.

Figure 5:2 compares the Riksbank's repo rate forecasts during 2007 with the market's expectations of the future repo rate on the day before publication ("before") and the day after publication ("after").²⁵

In February 2007, the Riksbank published its own interest rate forecast for the first time. Before publication, the market expected a higher repo rate path than that published by the Riksbank (see unbroken red line in Figure 5:2). At this point in time, the market had no experience of repo rate forecasts from the Riksbank and a certain degree of deviation was thus only to be expected. After the meeting, the market's expectations moved downwards towards the Riksbank's forecast (see broken red line in Figure 5:2). From the autumn, the market's expectations of the development of the repo rate were approximately in line with the Riksbank's published repo rate paths.

Figure 5:3 illustrates the manner in which the market's expectations deviated from the Riksbank's repo rate forecasts in 2008. In February, the market was expecting a much lower repo rate path than was subsequently published (see unbroken red line in Figure 5:3). After the decision, the market's expectations increased, but they were still below the Riksbank's forecast on the day after publication. However, after this, the market's expectations approached the Riksbank's forecast and, by April, the market's expectations had come into line with the Riksbank's forecasts both before and after publication. In July, the Riksbank adjusted the repo rate path upwards. The market had been expecting an increase in the repo rate path, although not such a large one. Expectations increased considerably, even exceeding the Riksbank's repo rate forecast for horizons of over one year (see broken yellow line in Figure 5:3). In September and October, expectations were back in line with the Riksbank's forecast. While the repo rate path certainly decreased comparatively steeply in October, this was expected by the market, partially as a result of the information published in conjunction with the extraordinary monetary policy meeting held at the start of October. Finally, at a meeting brought forward to December 2008, the Riksbank cut the repo rate by 175 percentage points. This was the single largest repo

²⁵ The predictability of the Riksbank's repo rate forecasts has not been discussed previously in the material for assessing monetary policy.

rate change since inflation targeting was introduced in 1993. At the same time, the repo rate path was cut significantly, although not by as much as the market had expected (see the purple unbroken line in Figure 5:3).

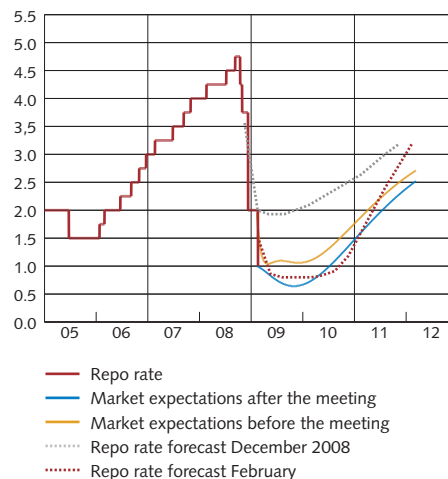
To sum up, the Riksbank's repo rate paths during 2007 and 2008 generally had a high degree of predictability. In four cases out of six, expectations during 2008 were already in line with the Riksbank's forecast before publication, which can be interpreted as indicating that the market's ability to predict and understand monetary policy was strong. When greater deviations were present, in most cases, the market adjusted its expectations to reflect the repo rate path after publication.

However, during 2009, relatively major differences arose between the market's expectations and the Riksbank's repo rate forecasts (see Figure 5:4 – 5:6). In February, the Riksbank cut the repo rate forecast markedly, by slightly more than the market had expected. The market's expectations subsequently changed, moving closer to the Riksbank's forecast, at least a couple of years ahead (see Figure 5:4).

In advance of the monetary policy meeting in April, the market expected that the forecast for the repo rate over the next year would be cut again. However, the Riksbank's new forecast entailed a considerably lower repo rate in 2010 and 2011 than the market had expected. Even so, the Riksbank's new forecast did not significantly affect market expectations (see Figure 5:5). In the period leading up to December, market expectations of the development of the repo rate changed very little, even though the Riksbank cut its repo rate forecast further in July, and then held to this forecast during the entire autumn (see Figure 5:6). The next section discusses possible reasons for the difference between the repo rate forecasts of the market and the Riksbank.

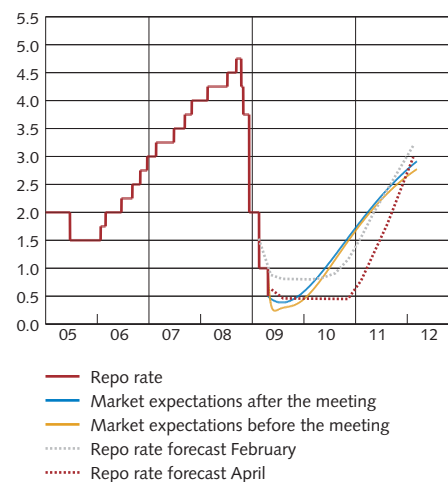
However, from December, market expectations have approached the Riksbank's forecasts (see Figure 5:6). The Riksbank's recurring information on an unchanged and low repo rate path, combined with the twelve-month loans at a low and fixed interest rate that were being offered after the monetary policy meetings in July, September and October, contributed to drive the market participants' expectations of the repo rate path downwards (see the box "The Riksbank's complementary measures" in Chapter 2).

Figure 5:4. The repo rate, the repo rate path and monetary policy expectations in February 2009
Per cent



Sources: Reuters EcoWin and the Riksbank

Figure 5:5. The repo rate, the repo rate path and monetary policy expectations in April 2009
Per cent



Sources: Reuters EcoWin and the Riksbank

■ How does the Riksbank calculate the market's expectations of the repo rate?

In order to measure the market's expectations of the future repo rate, the Riksbank uses forward rates. Forward rates are interest rates determined today for investments or loans that will not be executed until a date in the future (settlement date) and which will then run for a determined duration, from settlement date until due date. One example could be the interest rate on a one-month interbank loan, one year ahead.

Forward rates can be calculated implicitly or observed directly on the market. Implicit forward rates are calculated on the basis of the day's interest rate on forward rate agreements with different maturities. For example, with the help of a six-month interest rate and a nine-month interest rate, the implicit three-month interest rate six months ahead can be calculated. Market-listed forward rates are derived from the price of interest derivatives traded on the markets and can thus be observed directly. The interest rate of forward rate agreements applying to the three-month interbank rate is an example of an actual three-month forward rate. In general, the levels of implied and market-listed forward rates correspond well. The Riksbank uses both market-listed forward rates and other interest derivatives to calculate forward rates.

The forward rate can be regarded as the sum of the expected average repo rate from settlement date to due date, a maturity premium that compensates for interest rate risk and other risk premiums depending upon liquidity and credit risks. Interest rate risk is the risk that interest rates will develop unfavourably for an investor during the period of time an instrument is owned. Interest rate risk arises when there prevails uncertainty around future interest rate development. The liquidity premium is to compensate for risks in the ownership of illiquid instruments. Credit risk is the risk that the counterparty in a contract will not be able to fulfil its obligations. The market's expectations of the repo rate are calculated as the forward rate adjusted for these premiums.

The premiums may vary over time. In order to calculate term premiums, the Riksbank utilises assumptions concerning the size of the risk premiums based on historical experience and empirical model assessments, among other tools. During 2009, these assumptions may have underestimated the level of risk premiums. This may be one of the reasons behind the major differences between the repo rate path and the estimated market expectations.

How can the gap between market expectations and the Riksbank's repo rate forecasts in 2009 be explained?

Several factors may have contributed towards the occasionally large differences between the Riksbank's repo rate forecast and the market's expectations. Among other factors, there are several technical difficulties associated with the estimation of market expectations that can explain the gap, to a certain extent.

■■ Assumptions regarding risk premiums can be misleading

The Riksbank estimates the market's expectations by excluding various risk premiums from the forward rates (see the box "How does the Riksbank calculate the market's expectations of the repo rate?"). To do this, the Riksbank makes an assumption on the size of the risk premium. However, one problem is that the premiums can vary over time and there is a risk that, in a situation characterised by increased macroeconomic uncertainty and financial turmoil, these assumptions may underestimate the actual premiums. In such a case, the market's expectations become overestimated and the difference between these and the Riksbank's forecast is thus narrower than indicated by Figures 5:4 and 5:5. During the larger part of 2009, the Riksbank's calculations of market expectations may actually have overestimated market expectations. But at the same time, the surveys of repo rate expectations conducted at the end of 2009 indicated that expectations were in line with the market expectations that the Riksbank had estimated on the basis of forward rates. This suggests that the Riksbank's estimations of forward rates are currently reasonable.

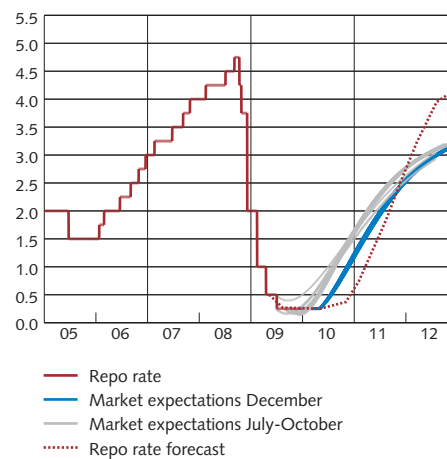
■■ Repo rates close to zero may distort expectations

Another technical difficulty may arise when the repo rate is close to zero. Uncertainty regarding the Riksbank's forecasts is symmetrical, that is there exists an equal probability that the repo rate will be above or below the published repo rate path. When the repo rate is close to zero, the assumed probability for a negative repo rate in the forecast can be high. However, if the market deems it unlikely that the repo rate will be cut to a level below zero, this may mean that the market's expectations, on average, lie above the Riksbank's forecast. However, according to the Riksbank's preliminary estimates, this difficulty is of little significance to the gap.

■■ The market may question the repo rate path

Another possible explanation may be that money market participants have taken a more positive view of the expected economic development. For example, they may have expected that GDP growth and inflation would be higher in future than stated in the Riksbank's

Figure 5:6. The repo rate, the repo rate path and monetary policy expectations in July – December 2009
Per cent



Note. The repo rate forecast for the final quarter of 2012 has been taken from the Monetary Policy Report October and the Monetary Policy Update, December.

Sources: Reuters EcoWin and the Riksbank

forecast, a circumstance which may require a tighter monetary policy. However, this hypothesis is not supported by surveys of the expected economic development.²⁶

Other reasons than economic development may also have lain behind the market participants' unwillingness to believe that monetary policy would follow the published repo rate path. The market participants may have believed that the Riksbank's reaction pattern looked different and that the Riksbank would thus increase the repo rate faster than announced. Another possibility is that of disunity in the Executive Board. At the monetary policy meetings in July, September, October and December, reservations against the published repo rate path were entered by members who considered that the repo rate path in 2010 should be slightly higher.

All in all, it is thereby reasonable to assume that the differences between the Riksbank's published repo rate path and the path expected by the market participants is at least partially due to the fact that the market participants expected another development of the repo rate path. However, it is difficult to determine exactly why the market participants expected another path.²⁷

26 See TNS SIFO Prospera's survey of expectations of inflation and GDP growth among money market participants in 2009.

27 See also Lars E.O. Svensson, "Policy expectations and policy evaluations: the role of transparency and communication" *Sveriges Riksbank Economic Review*, No. 1, 2010.

Sveriges riksbank
103 37 Stockholm

Tel +46 8 787 00 00
Fax +46 8 21 05 31
registratorn@riksbank.se
www.riksbank.se

