



Account of monetary policy

2012

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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 account 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 main features of the report are summarised in Chapter 1. Chapter 2 describes the monetary policy conducted in 2012, while Chapter 3 investigates target fulfilment in 2012. Chapter 4 analyses the accuracy of the forecasts and Chapter 5 studies whether the repo-rate decisions in 2012 were predictable and what surveys and market pricing indicated with regard to expectations of future monetary policy. The report also contains a number of boxes, describing for instance, the development of inflation in a more long-term perspective and the Riksbank's development work.

This publication was previously named Material for assessing monetary policy. The Account of Monetary Policy 2012 is available, like the previous reports, 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.

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Monetary policy in Sweden¹

MONETARY POLICY STRATEGY

- According to the Sveriges Riksbank Act, the objective for monetary policy is to maintain price stability. The Riksbank has specified this as a target for inflation, according to which the annual change in the consumer price index (CPI) is to be 2 per cent.
- While monetary policy aims at attaining the inflation target, it simultaneously supports the objectives of general economic policy with a view to achieving sustainable growth and high employment. This is achieved through the Riksbank, in addition to stabilising inflation around the inflation target, endeavouring to stabilise production and employment around paths that are sustainable in the long term. The Riksbank therefore conducts what is generally referred to as flexible inflation targeting. This does not mean that the Riksbank neglects the fact that the inflation target is the overriding objective.
- It takes time before monetary policy has a full impact on inflation and the real economy. Monetary policy is therefore guided by forecasts for economic developments. The Riksbank publishes its own assessment of the future path for the repo rate. This repo-rate path is a forecast, not a promise.
- In connection with every monetary policy decision, the Executive Board makes an assessment of the repo-rate path needed for monetary policy to be well-balanced. It is thus normally a question of finding an appropriate balance between stabilising inflation around the inflation target and stabilising the real economy.
- There is no general answer to the question of how quickly the Riksbank aims to bring the inflation rate back to 2 per cent if it deviates from the target. A rapid return may in some situations have undesirable effects on production and employment, while a slow return may have a negative effect on confidence in the inflation target. The Riksbank's ambition has generally been to adjust the repo rate and the repo-rate path so that inflation is expected to be fairly close to the target in two years' time.
- According to the Sveriges Riksbank Act, the Riksbank's tasks also include promoting a safe and efficient payment system. Risks linked to developments in the financial markets are taken into account in the repo-rate decisions. With regard to preventing an imbalance in asset prices and indebtedness, the most important factors, however, are effective regulation and supervision. Monetary policy only acts as a complement to these.
- In some situations, as in the financial crisis 2008-2009, the repo rate and the repo-rate path may need to be supplemented with other measures to promote financial stability and ensure that monetary policy is effective.
- The Riksbank endeavours to ensure that its communication is open, factual, comprehensible and up-to-date. This makes it easier for economic agents to make good economic decisions. It also makes it easier to evaluate monetary policy.

DECISION-MAKING PROCESS

The Executive Board of the Riksbank usually holds six monetary policy meetings 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 the arguments made by the different Executive Board members.

PRESENTATION OF THE INTEREST RATE DECISION

The repo-rate decision is presented in a press release at 9.30 a.m. on the day following the monetary policy meeting. The press release also states how the individual Executive Board members voted and provides the main motivation for any reservations entered. A press conference is held on the day following the monetary policy meeting.

¹ A detailed description of the monetary policy strategy is contained in the document *Monetary Policy in Sweden*. The document is available as a PDF file on the Riksbank's website, www.riksbank.se under the heading Monetary policy/Price stability.

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■ CHAPTER 1 – Summary

During 2012 inflation was lower than the Riksbank's target of 2 per cent and resource utilisation in the economy was lower than normal. Both CPI and CPIF inflation were on average around 1 per cent. The fact that inflation was so low was largely due to international economic activity weakening in a way that surprised the Riksbank and other analysts during the second half of 2011. In 2012 the Riksbank cut the repo rate from 1.75 to 1 per cent to support economic activity and bring inflation back on target.

There was a high level of concordance among the different analysts' forecasts for 2012. In a comparison over a longer period of time, the differences in forecasting performance are small as well.

This year, it is 20 years since the Riksbank took the decision to focus monetary policy on achieving an inflation target. Since the inflation target was introduced, inflation has been much lower and much more stable than in the 1970s and 1980s.

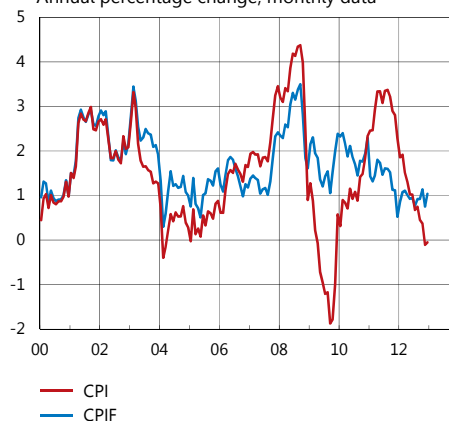
Economic activity weakened and inflation was below the target in 2012

During 2012 economic activity weakened and the Riksbank cut the repo rate on three occasions to 1 per cent at the end of the year. However, inflation was below the Riksbank's target of 2 per cent. Both CPI and CPIF inflation, that is the CPI with a fixed mortgage rate, were on average around 1 per cent in 2012. While CPIF inflation was relatively stable at around 1 per cent during 2012, CPI inflation fell from 1.9 per cent in January to -0.1 per cent in December, primarily due to the Riksbank cutting the repo rate (see Figure 1:1). GDP increased by 0.8 per cent and unemployment rose slightly, from 7.8 per cent in 2011 to 8.0 per cent. Different measures of resource utilisation calculated by the Riksbank point to resource utilisation being lower than normal during the year, which also corresponds to the Riksbank's overall assessment of resource utilisation.

At the same time, in an international perspective, Sweden has managed relatively well during the recent years of financial and debt crises. Growth in GDP in recent years has been much higher than in many other countries. However, it slowed down unexpectedly at the end of 2011, when developments abroad deteriorated (see Figure 1:2).

With hindsight, one could argue that the low inflation outcome and the relatively weak real economy during 2012 imply that the repo rate could have been somewhat lower at an earlier stage. But this assumes that the Riksbank would have been able to predict the development of the debt crisis that weakened international developments during the second half of 2011 and lead to a gloomier outlook for Swedish GDP growth. Far into 2011, both the Riksbank and other analysts had a more positive picture of developments in 2012 than the actual outcome. A more expansionary monetary policy than the one implemented would also have required that a lower repo rate was not considered likely to increase the risks connected with household indebtedness, something that has worried most Executive Board members in recent years.

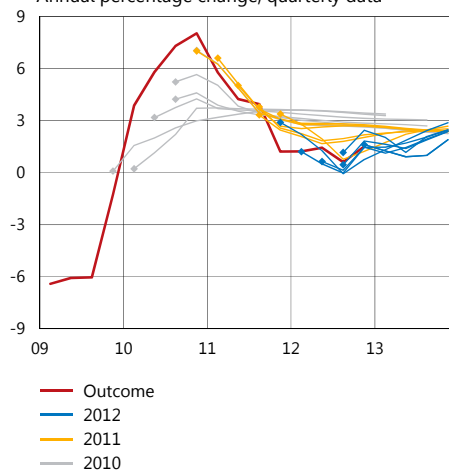
Figure 1:1. Development of inflation 2000-2012
Annual percentage change, monthly data



Note. The CPIF is the CPI with a fixed mortgage rate.

Source: Statistics Sweden

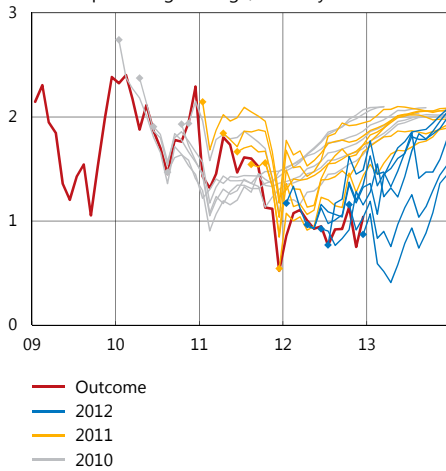
Figure 1:2. GDP growth, outcome and forecasts
Annual percentage change, quarterly data



Note. The thin lines represent the Riksbank's forecasts 2010-2012. The marks show the starting point of each forecast and may therefore deviate from the latest outcome at that point in time.

Sources: Statistics Sweden and the Riksbank

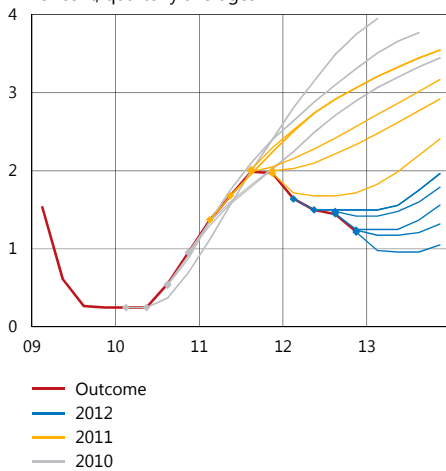
Figure 1.3. CPIF, outcome and forecasts
Annual percentage change, monthly data



Note. See the note to Figure 1.2. The CPIF is the CPI with a fixed mortgage rate.

Sources: Statistics Sweden and the Riksbank

Figure 1.4. Repo rate, outcome and forecasts
Per cent, quarterly averages



Note. See the note to Figure 1.2.

Source: The Riksbank

Figure 1.5. Unemployment, outcome and forecasts
Per cent of the labour force, aged 15-74,
seasonally-adjusted data, quarterly data



Note. See the note to Figure 1.2. The labour force surveys (AKU) published in February 2013 revised statistics for the labour market developments during 2010-2012. See footnote 33. The outcomes refer to revised figures.

Sources: Statistics Sweden and the Riksbank

Why did inflation deviate from the target in 2012?

The difference between CPI and CPIF inflation can be considerable during periods when the repo rate is raised or cut substantially. This has been the case in recent years. In situations where repo-rate changes have a considerable effect on the CPI, CPIF inflation can provide a better picture of the long-term development of inflation and thus better guidance for monetary policy decisions.² The monetary policy decisions made during 2010-2012 therefore focused to a large degree on the forecasts for inflation measured in terms of the CPIF.

■ The Riksbank expected an economic recovery and CPIF inflation close to 2 per cent at the end of 2012

During 2010 and the first half of 2011, the Riksbank was expecting that the rapid recovery would continue in 2012. GDP growth was expected to be 2.5 to 3.5 per cent (see Figure 1:2).³ At the same time, the Riksbank expected in the forecasts made in 2010 that CPIF inflation would fall and be around 1.5 per cent during 2011, as a result of rapidly-increasing productivity and a stronger krona following the severe weakening in 2008-2009. Inflation would then rise apace with the ongoing recovery (see Figure 1:3). The Riksbank therefore expected that monetary policy would need to be less expansionary and that the repo rate would need to be raised gradually from the historically low level of 0.25 per cent (see Figure 1:4). CPIF inflation would then be close to 2 per cent at the end of 2012, or the beginning of 2013. As a result of the planned repo-rate increases, the Riksbank was expecting that CPI inflation would be close to 3 per cent at the end of the forecast period.

As a further reason for conducting a less expansionary monetary policy, there was considerable uncertainty during the period 2010-2011 regarding what the rapid recovery might entail. Growth was stronger than expected and the GDP forecasts were gradually adjusted upwards, particularly in the near term (see Figure 1:2). At the same time, the labour market was stronger than expected, employment increased and unemployment fell (see Figure 1:5). The Executive Board discussed, for instance, the risk of bottlenecks in the economy and a faster increase in the rate of inflation. The Board also saw risks in holding the repo rate at a low level over a long period of time, as this could lead to a rapid increase in household debt. During the first half of 2011, there was also concern that the high CPI inflation would become entrenched in the long-run inflation expectations.

² See the article "The CPI and other measures of inflation".

³ See Chapter 3.

■ Deteriorating growth prospects in 2011 led to lower inflation

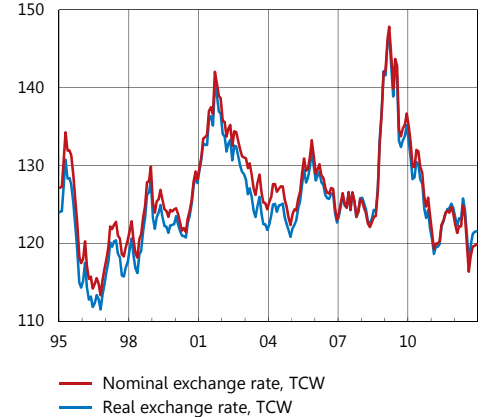
During summer and autumn 2011, there was a significant change in conditions. The concerns regarding developments in public debt in the United States and several countries in the euro area increased and international growth was weaker than expected. The Riksbank gradually revised down its forecast for GDP growth and postponed the planned repo-rate increases (see Figures 1:2 and 1:4). At the end of 2011 it became increasingly clear that growth was slowing down relatively severely and the Riksbank cut the repo rate in December. The economic outlook continued to deteriorate in 2012, the forecasts for unemployment were revised up and the repo rate was cut in February, September and December (see Figures 1:5 and 1:4). All in all, the repo rate was cut from 1.75 to 1.0 per cent during the year. The forecast for the repo rate was revised down.

The weak developments abroad contributed to lower domestic demand and lower inflationary pressures in the Swedish economy and made it more difficult for companies to raise their prices. This picture is supported by the Riksbank's company surveys from 2012, where companies stated that prices were subdued by weak demand and stiff price pressure.⁴ In addition, the krona exchange rate affected inflation. Following a severe weakening in connection with the financial crisis at the end of 2008 and beginning of 2009, the Swedish krona strengthened and the real exchange rate returned to more normal long-run levels (see Figure 1:6).⁵ It is difficult to estimate in advance to what extent and how rapidly consumer prices are affected by such extreme fluctuations in the nominal exchange rate and the pass-through effects can vary over time, for instance, depending on the economic situation. According to the Riksbank's expectations, the krona appreciation in 2009-2010 would lead to lower import prices, with a restraining effect on inflation. The continued fall in goods prices now indicates that the krona appreciation may have subdued inflation over a longer period of time than the Riksbank had anticipated.

During 2010 and the first half of 2011, the Riksbank assessed that CPIF inflation would on average be 1.6 per cent in 2012 and CPI inflation would be 2.5 per cent. The main explanation for inflation being much lower in 2012 could be said to be the deterioration in the international economic climate that began during the second half of 2011. The particularly low outcome for CPI inflation is linked to the fact that the Riksbank cut the repo rate from 2.0 per cent in December 2011 to 1.0 per cent in December 2012.

Figure 1:6. TCW-weighted nominal and real exchange rate

Index, 18 November 1992 = 100, monthly data



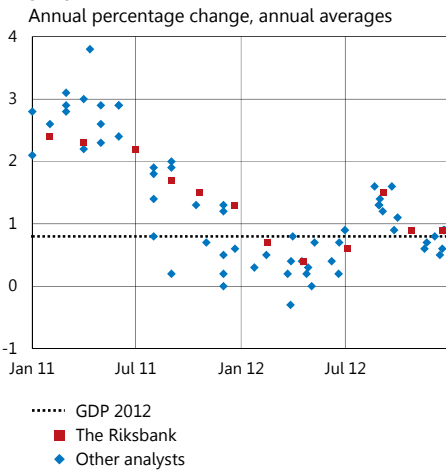
Note. TCW refers to a weighting of Sweden's most important trading partners.

Source: The Riksbank

⁴ In the article "What unforeseen shocks have affected CPIF inflation? A model analysis" the Riksbank's macroeconomic model, Ramses, is used to illustrate the factors behind the unexpectedly low CPIF inflation in 2012.

⁵ The real exchange rate is assessed to be close to a long-run level, in accordance with fundamental economic determinants. During 2012, the real exchange rate measured in terms of TCW weights was slightly stronger than the average since 1995, but weaker than the average from 1980. Measured in terms of the broader exchange rate index, KIX, the real exchange rate was slightly weaker than the average since 1995.

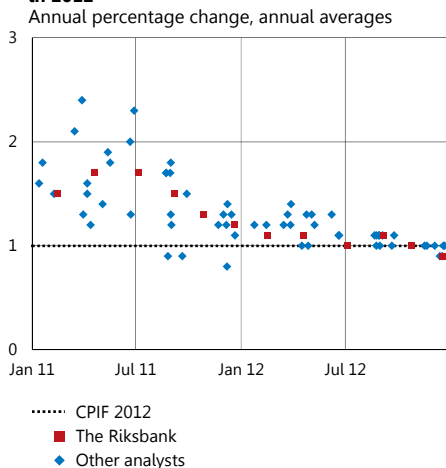
Figure 1.7. Forecasts 2011-2012 for GDP growth in 2012



Note. Other analysts refers to 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.

Sources: Respective analysts, Statistics Sweden and the Riksbank

Figure 1.8. Forecasts 2011-2012 for CPIF inflation in 2012



Note. Other analysts refers to the Swedish Ministry of Finance, the National Institute of Economic Research, the Swedish Trade Union Confederation (LO), Nordea, SEB, Svenska Handelsbanken, the Confederation of Swedish Enterprise and Swedbank. The CPIF is the CPI with a fixed mortgage rate.

Sources: Respective analysts, Statistics Sweden and the Riksbank

Small differences in forecasts by different analysts

The Riksbank was not alone in revising its view of the economic outlook. An examination of the forecasts for 2012 made by the Riksbank and other analysts in 2011-2012, reveals, as is usually the case, a large degree of concordance.⁶ During the first half of 2011, Swedish economic analysts had a relatively positive view of economic developments in 2012. The forecasts for GDP growth and CPIF inflation were higher than the final outcome (see Figures 1:7 and 1:8), while unemployment was underestimated. Consequently, the forecasts for the repo rate were also too high. During the second half of the year, the forecasts for GDP growth and CPIF inflation were gradually revised down as information pointing to weaker growth began to arrive.

Even in a comparison over a longer period of time, the differences in forecasting performance are small. The Riksbank appears to have made relatively good forecasts for GDP growth, unemployment and CPIF inflation, while the accuracy of the forecasts is relatively poorer for the repo rate and thus also for CPI inflation. However, the differences in forecasting performance between the different analysts are small, even in a longer perspective, and there are generally few statistically significant differences.

Continued repo-rate cuts but different views on appropriate pace

As inflationary pressures continued to decline and growth prospects for the Swedish economy deteriorated further, the Riksbank continued to conduct more expansionary monetary policy during 2012. The Executive Board assessed that a more expansionary monetary policy was necessary to attain the inflation target and a gradual normalisation of resource utilisation.

However, there were differing opinions among Executive Board members as to how much and how fast the repo rate should be cut.⁷ Two members advocated a more expansionary monetary policy. The different assessments reflected, for instance, differences in views regarding risks linked to household indebtedness, the Swedish labour market and the capacity of monetary policy to further reduce unemployment, as well as the forecasts for policy rates abroad.

The Riksbank's development work 2012-2013

The Riksbank's development work reflects the questions that are important to the Executive Board's monetary policy stance. The questions that were in focus in 2012 largely concern two areas that have been important in recent years: the labour market and the significance of financial developments for monetary policy.⁸ For instance, the Riksbank

⁶ See Chapter 4.

⁷ See Chapter 2, the section "Important issues in the monetary policy discussion".

⁸ See the article "The Riksbank's development work 2012-2013".

carried out a more detailed analysis of the workings of the labour market, continued efforts to embed financial analysis in the modelling and forecasting procedures, and developed a method for quantifying and illustrating measurement uncertainty in monetary policy expectations.

The development of inflation in a longer perspective

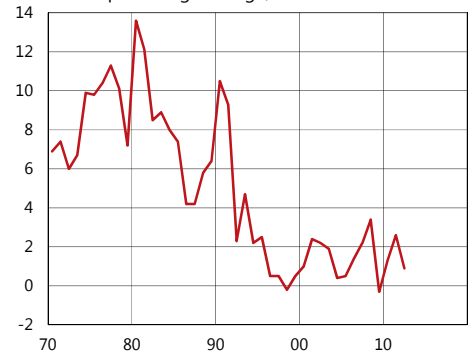
During the year, the Riksbank also analysed long-run target fulfilment.⁹ It is now twenty years since the Riksbank decided to introduce an inflation target. Inflation targeting is normally regarded as one of the more central components in the transformation of economic policy in connection with the 1990s crisis, and is seen as one of the factors that has contributed to a more beneficial development of the Swedish economy since then. One of the main problems prior to the crisis was the excessively high inflation in Sweden in relation to other countries. During the 1970s and 1980s, inflation fluctuated substantially and often reaching double-digit figures. Since the inflation target was introduced inflation has been much lower and more stable (see Figure 1:9). For some time after the inflation target was introduced, inflation expectations began to shift downwards and expectations for the long run have been firmly anchored around the inflation target since the late 1990s (see Figure 1:10).

Exactly how high inflation has been during the period with an inflation target depends on how it is calculated. If one calculates average inflation in terms of the CPI since the inflation target began to apply in 1995, it amounts to 1.4 per cent.¹⁰ A large proportion of the deviation from the target is due to CPI inflation being lower as a result of mortgage rates falling, which reflects a general downward trend in interest rates since the mid-1990s. If measured in terms of the CPIF, inflation amounted to 1.8 per cent in the period 1995-2012. Other factors that have dampened both CPI and CPIF inflation are that productivity growth has periodically been surprisingly high and that prices of imported goods have been unexpectedly low.

It is a question of judgement to what extent this outcome should be interpreted as showing that inflation-targeting has been successful. But, given the high and fluctuating inflation rates earlier, the policy of inflation targeting appears to have been beneficial. Although inflation on average has not exactly reached the level of 2 per cent, it has been reasonably close to the target and much more stable.

Figure 1:9. CPI since 1970

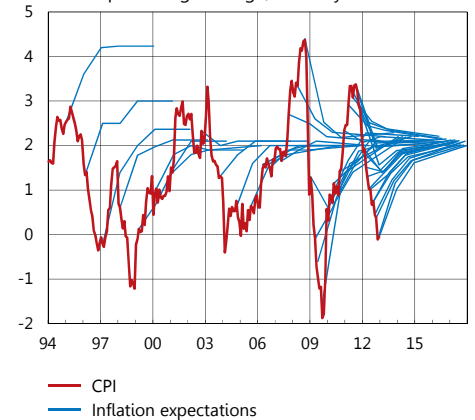
Annual percentage change, annual data



Source: Statistics Sweden

Figure 1:10. Inflation expectations among money market participants

Annual percentage change, monthly data



Note. Inflation expectations among money market participants one, two and five years ahead.

Sources: Statistics Sweden and TNS SIFO Prospera

⁹ See the article "The development of inflation in a longer perspective".

¹⁰ This calculation and corresponding calculation for the CPIF take into account the fact that the definition of the CPI was changed in 2005, that is, it states the average real-time inflation rate.

■ On assessing monetary policy

It is important that monetary policy is assessed regularly so that the Riksdag and the public can make sure that the Riksbank is performing to a high standard. Assessments of monetary policy also provide a useful basis for the Riksbank to develop and improve its analysis.

What monetary policy can do

When assessing monetary policy, it is important to start with a realistic view of what monetary policy can achieve. Monetary policy can ensure that inflation is in line with the inflation target over a number of years. This is why most central banks have price stability as their main objective. Over more limited periods, monetary policy can also affect real-economic variables such as production and employment. However, it is not possible, for example, to achieve sustained high growth and employment by conducting a systematically expansionary monetary policy. Monetary policy thus cannot in this sense "create" employment and growth.

Normally, monetary policy is about finding an appropriate balance between stabilising inflation around the inflation target and keeping the economy in balance. According to the Sveriges Riksbank Act, the Riksbank's tasks also include promoting a safe and efficient payment system. Risks associated with developments on the financial markets may therefore also need to be taken into account in the repo-rate decisions.¹¹

Deviations between targets and outcomes are natural

A comparison between the outcomes for inflation and the inflation target does not necessarily show how well monetary policy has been conducted. The Riksbank may deliberately allow inflation to temporarily deviate from the target in its effort to simultaneously keep inflation stable and the economy in balance. For example, the Riksbank may refrain from rapidly bringing inflation back to the inflation target if the assessment is that this will have a substantial negative impact on the real economy. This may be the case after a shock that pushes up inflation but subdues activity in the economy. It is possible to make such deliberate deviations as long as confidence in the inflation target is not undermined, that is as long as inflation expectations a few years ahead are well-anchored to the target.

Another circumstance that must be taken into account if CPI inflation deviates from the target is that there are substantial but transitory effects on CPI inflation when the repo rate is significantly raised or lowered. This is because changes in the repo rate have a direct impact on the households' mortgage costs. In such situations, a measure of inflation that adjusts for the direct effects of repo-rate changes provides better guidance for the monetary policy decisions and for analyses of how well-balanced monetary policy has been.¹²

A deviation between outcomes and the target may also be because the forecasts that monetary policy was based on were not good enough. An analysis of the quality of the forecasts is an important element of an

¹¹ See also the description of monetary policy in Sweden on page 2 of this Report.

¹² See the article "The CPI and other measures of inflation".

assessment of monetary policy; for example the Riksbank's forecasts can be compared to those of other forecasters.

Another explanation of deviations between targets and outcomes is that the economy is constantly affected by unexpected shocks. Consequently, even well-founded and carefully-analysed forecasts often turn out to be wrong. It may therefore be more appropriate to analyse whether repo-rate decisions appear to be reasonable given the information that was available when the decisions were made than to study the situation after the event once the outcome is known. In the next stage, the inflation outcomes can be compared to the inflation target, that is monetary policy can be assessed in retrospect. The analysis can then, for example, identify the shocks that caused any deviations from the target.

Monetary policy should be predictable

There may also be good reasons for analysing how predictable monetary policy has been in an assessment. If the Riksbank is successful in its communication, market participants and others should be able to predict how new information will affect the repo rate rather well. Market rates can then adjust already before the Riksbank decides on the repo rate and interest-rate movements on the market in connection with the decisions will then be limited.

■ The CPI and other measures of inflation

There are good reasons to formulate the inflation target in terms of the CPI, but other measures can also be important for monetary policy. One of the more central of these is the CPIF, which is the CPI with a fixed mortgage rate.

Inflation can be measured in many different ways. One key question is therefore which price index the Riksbank's inflation target should refer to. The need for a nominal anchor that stabilises the *general* rate of price increases is an argument in favour of specifying the inflation target in terms of a broad price index that is well-known to the public. This has been the most important argument for the Riksbank when specifying its inflation target in terms of the CPI, which Statistics Sweden calculates and reports every month.¹³ In addition, the CPI statistics are of good quality, are not normally revised, and are published soon after the end of the month. There are thus strong arguments for stating the inflation target in terms of this index. In their evaluation of the Riksbank's monetary policy and work regarding financial stability 2005-2010, Professors Charles Goodhart and Jean-Charles Rochet also supported this view.¹⁴ In its report on this evaluation, the Riksdag Committee on Finance agreed with this conclusion.¹⁵

Even if the inflation target is formulated in terms of the CPI, other measures of inflation may be useful for analysing and forecasting the development of inflation. Large and temporary changes in the prices of individual goods and services can have significant, but transitory, effects on CPI inflation. Monetary policy should not react to such effects. To describe the more long-term development of inflation and to better explain its monetary policy, the Riksbank can choose to highlight other measures of inflation. There are several ways of calculating such measures. The common factor for them is that they focus on the general trend of price movements and do not take account of price fluctuations that are deemed to only temporarily affect the development of the CPI, for example temporary increases and decreases in energy prices.¹⁶

The CPI includes households' housing costs. These housing costs depend, for instance, on mortgage rates, which in turn are affected when the Riksbank adjusts the repo rate. For example, an increase in the repo rate leads to higher mortgage rates. Normally, the Riksbank increases the repo rate to counteract a future increase in inflation, but the direct effect of the higher mortgage rates is that the CPI will instead rise further. There is thus reason to analyse inflation measures that are not directly affected by the Riksbank's repo-rate adjustments. One such measure is the CPIF, which is the CPI with a fixed mortgage rate (see Figure 1:1). When calculating the CPIF, the direct effects of changes in the repo rate

¹³ The CPI measures the price of a basket of goods and services, including 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 thus given a greater weighting in the CPI.

¹⁴ See Goodhart, Charles and Jean-Charles Rochet, "Evaluation of the Riksbank's monetary policy and work with financial stability 2005-2010", *Reports from the Riksdag* 2010/11: RFR5.

¹⁵ See the Riksdag Committee on Finance's report 2012/13:FiU12 "Evaluation of the Riksbank's monetary policy and work with financial stability 2005-2010", Swedish Riksdag.

¹⁶ See Hansson, Jesper, Jesper Johansson and Stefan Palmqvist, "Why do we need measures of underlying inflation?" *Sveriges Riksbank Economic Review* 2008:2, Sveriges Riksbank.

on mortgage rates are thus disregarded. In the longer run, when the repo rate has stabilised, CPI inflation and CPIX inflation coincide.¹⁷ However, during certain periods, when the repo rate is raised or cut substantially, as has been the case in recent years, there can be a significant difference between CPI inflation and CPIX inflation.

¹⁷ See Johansson, Jesper, Stefan Palmqvist and Carina Selander, "The CPI will increase more rapidly than the CPIX over the next few years", *Economic Commentaries* no. 5, 2011, Sveriges Riksbank.

CHAPTER 2 – Monetary policy 2012

The weak developments in the euro area had a negative effect on growth prospects for the Swedish economy in 2012. A low level of resource utilisation, low cost pressures and a stronger krona also meant that inflation was low. During 2012, the Riksbank cut the repo rate by a total of 0.75 percentage points, and lowered its forecast for the repo rate a couple of years' ahead. The Executive Board was agreed that monetary policy needed to be more expansionary, but opinions were divided as to how much the repo rate and the repo-rate forecast should be adjusted down.

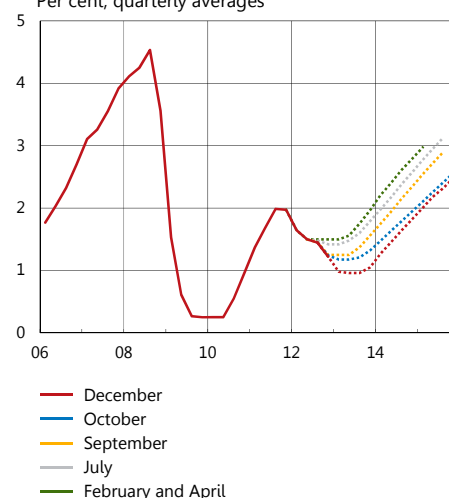
Introduction

The already weak economic developments in the euro area continued to deteriorate in 2012.¹⁸ Demand for Swedish exports, which had slowed down at the end of 2011, was further dampened. Developments abroad and weak exports in turn led to a deterioration in growth prospects for the Swedish economy at large. Nevertheless, Swedish GDP growth was surprisingly high for most of the year, thanks to relatively strong domestic demand. Inflation was also affected by the weaker developments abroad and was low due to low cost increases in Swedish companies and a stronger krona.

Given the falling inflationary pressure and the slowdown in the Swedish economy, the Riksbank continued to conduct a more expansionary monetary policy and cut the repo rate on three occasions, by a total of 0.75 percentage points, to 1.0 per cent. The forecast for the repo rate at the end of 2014 was revised down by around 1 percentage point (see Figure 2:1). This meant that the real repo rate, which may illustrate how expansionary monetary policy is, was negative in 2012 and was expected to remain negative until the end of 2014 (see Figure 2:2). The Executive Board assessed that a more expansionary monetary policy was necessary to attain the inflation target and lead to a gradual normalisation of resource utilisation. The first part of this chapter describes these monetary policy decisions (all of the decisions and reservations are described in the box Monetary policy decisions and reservations 2012 at the end of this chapter).

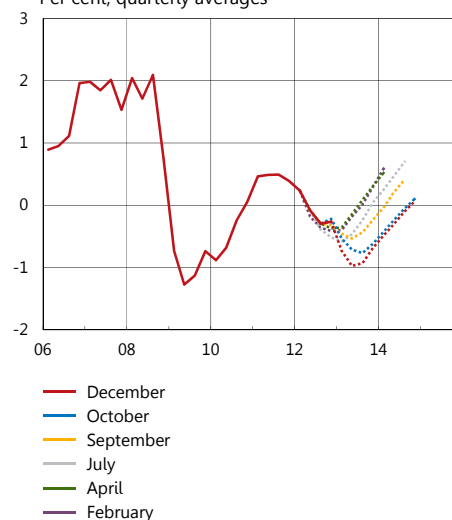
However, there were differing opinions among Executive Board members as to how much and how fast the repo rate should be cut. The different assessments reflected, for instance, differences in the views of risks linked to household indebtedness, views on the Swedish labour market and on the capacity of monetary policy to further reduce unemployment. This and other important questions in the monetary policy discussion are dealt with in the second part of this chapter.

Figure 2:1. Repo rate, forecasts 2012
Per cent, quarterly averages



Note. The repo-rate forecasts of February and April are so close to each other that they are illustrated using a shared broken line.
Source: The Riksbank

Figure 2:2. Real repo rate, forecasts 2012
Per cent, quarterly averages



Note. The real repo rate is calculated as an average of the Riksbank's repo-rate forecasts for the coming year minus the inflation forecast (CPIF) for the corresponding period.
Source: The Riksbank

¹⁸ For further background information, see the article "Economic developments 2009-2010".

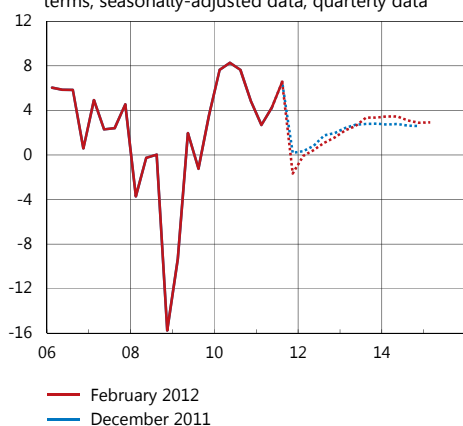
Figure 2:3. Stock market movements
Index, 3 January 2006 = 100, daily data



Sources: Morgan Stanley Capital International, Reuters EcoWin, Standard & Poor's and STOXX Limited

Figure 2:4. GDP forecasts in December 2011 and February 2012

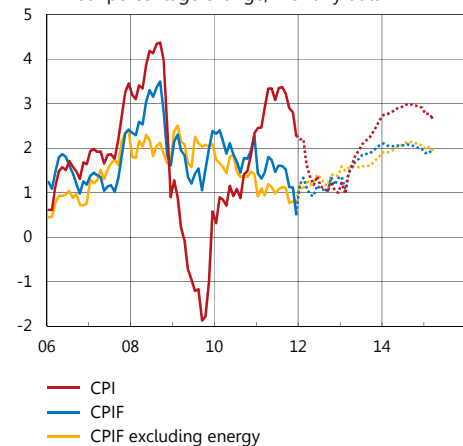
Quarterly changes in per cent calculated in annualised terms, seasonally-adjusted data, quarterly data



Sources: Statistics Sweden and the Riksbank

Figure 2:5. Inflation forecasts in February 2012

Annual percentage change, monthly data



Note. The CPIF is the CPI with a fixed mortgage rate.

Sources: Statistics Sweden and the Riksbank

Monetary policy decisions in 2012

■ The debt crisis in Europe dampened prospects for Swedish growth at the beginning of the year – the repo rate was cut and the repo-rate path was lowered in February

Ahead of the monetary policy decision in February, the Executive Board of the Riksbank faced a divided view of international economic developments. Growth in the world economy as a whole was expected to remain good in the years to come, primarily driven by rapidly-growing economies such as those of the so-called BRIC countries (Brazil, Russia, India and China). At the same time, growth in the euro area was expected to remain weak – even weaker than was expected in December 2011. However, at the start of 2012, there were some signs that the unease that had affected developments on the financial markets since the summer of 2010 due to fiscal problems in certain countries in the euro area had decreased. For example, share prices had risen (see Figure 2:3).

One explanation for the decline in the financial unease was that the European Central Bank (ECB) decided in December 2011 to offer banks in the euro area loans with a three-year maturity. In addition, some progress was made in the management of the sovereign debt crisis in the euro area in that the European Council took a decision in January 2012 on the so-called fiscal compact, the aim of which was to further reinforce fiscal policy discipline and coordination in the euro area countries. The Riksbank assessed that the most acute phase of the European sovereign debt crisis would abate over the course of the year.

Until the end of the third quarter of 2011, the Swedish economy had showed signs of resisting the European sovereign debt crisis relatively well. However, during the autumn, signs of weaker economic activity began to be apparent and, at the end of 2011 and start of 2012, there were signals that a severe downturn had taken place in the fourth quarter of 2011. These included monthly statistics indicating that Swedish exports had decreased. Growth prospects for the Swedish economy were assessed to have deteriorated since December 2011 (see Figure 2:4). Unemployment was also expected to rise somewhat in 2012. The Riksbank assessed that Swedish resource utilisation would be below normal in 2012 and 2013 and lower than in previous assessments, but that it would approach a normal level within three years.

Another aspect of the Swedish economy at the start of 2012 was that inflationary pressures were low. Recent years' moderate cost increases among companies and the appreciation of the Swedish krona were considered to underlie the low rate of inflation. However, CPIF inflation was expected to rise gradually in 2013 in tandem with the improvement in economic activity and the increase in resource utilisation (see Figure 2:5).

The poorer economic outlook and the low inflationary pressures in the Swedish economy led the Executive Board of the Riksbank to cut the repo rate by 0.25 percentage points to 1.50 per cent at the monetary

policy meeting in February. Moreover, they lowered the forecast for the future repo rate.¹⁹

■ Unchanged economic outlook and inflation prospects in April – repo rate and repo-rate path held unchanged

Ahead of the monetary policy meeting in April, it was noted that the view of international developments had remained largely unchanged since February. The Riksbank still assessed that the sovereign debt crisis in Europe would gradually be managed but that the continued weak outlook for the euro area would impair conditions for Swedish exports in the period ahead.

The outcome for the fourth quarter of 2011, which became available in time for the monetary policy meeting in April, showed that growth had been much less favourable than expected (see Figure 2:6). On the other hand, the National Institute of Economic Research's Economic Tendency Survey and retail trade figures, among others, showed an improvement in the development of the Swedish economy at the start of 2012 (see Figure 2:7). The Riksbank's overall assessment was thus that the prospects for economic activity in Sweden were more or less unchanged in relation to February.

At the same time, the Riksbank noted that inflation was still low. CPIF inflation was expected to remain low over the coming year, but increasing cost pressures and the normalisation of resource utilisation were expected to contribute to CPIF inflation gradually approaching 2 per cent in 2013.

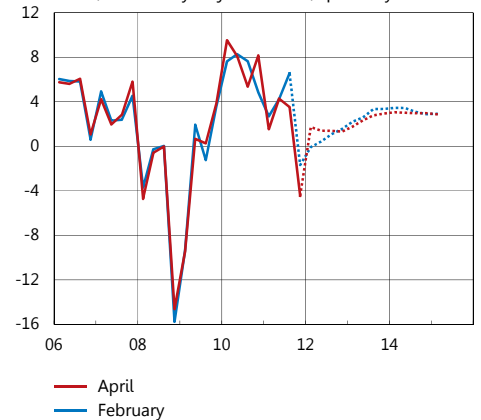
Considering that the economic outlook and inflation prospects were largely the same as in February, the Executive Board of the Riksbank decided in April to hold the repo rate unchanged at 1.5 per cent and to hold the forecast for the repo rate unchanged (see Figure 2:1).

■ Good Swedish growth in an uncertain international environment – repo-rate path nevertheless lowered in July

During the spring, uncertainty in the euro area increased due to the sovereign debt situation and the problems in the banking sector. Unease on the financial markets therefore increased again, which was reflected, for instance, in a fall in share prices in stock exchanges around the world (see Figure 2:3). Spain was one of the countries that continued to struggle with problems in its banking sector and public finances. The increased concern over the situation in Spain also brought attention to the situation in Italy, which led, among other consequences, to a rise in yields on government bonds in both Spain and Italy (see Figure 2:8).

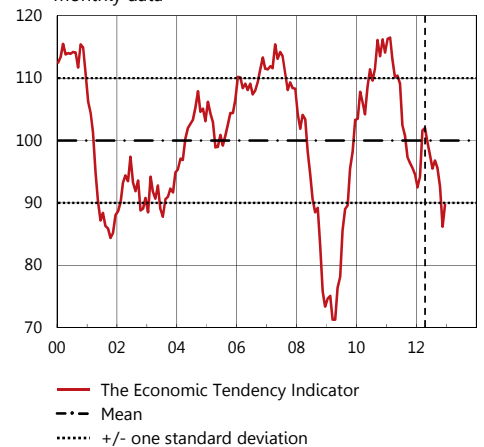
The renewed unease on the financial markets was expected to lead to a tighter credit situation and lower confidence on the part of households and companies, and thereby weaker consumption and investment. All in all, conditions for growth in the euro area had weakened since the Riksbank's assessment in April.

Figure 2:6. GDP forecasts in February and April 2012
Quarterly changes in per cent calculated in annualised terms, seasonally-adjusted data, quarterly data



Sources: Statistics Sweden and the Riksbank

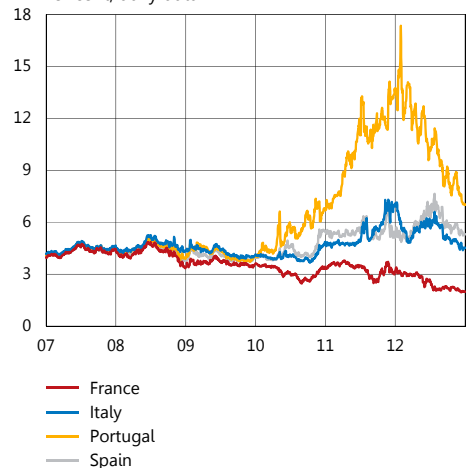
Figure 2:7. The Economic Tendency Indicator
Index, mean = 100, standard deviation = 10, monthly data



Note. Data along the broken vertical line marks outcomes after April 2012.

Source: National Institute of Economic Research

Figure 2:8. Government bond rates with 10 years left to maturity
Per cent, daily data

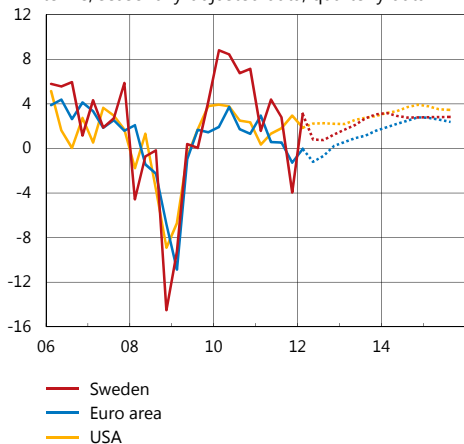


Source: Reuters EcoWin

¹⁹ Model-based analyses that were produced for the February meeting and which show effects of various assumptions regarding the development of the exchange rate and international growth are described in the article "Alternative scenarios for economic developments".

Figure 2:9. GDP forecasts in July 2012

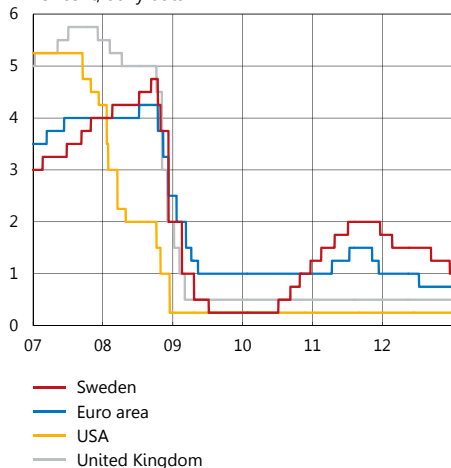
Quarterly changes in per cent calculated in annualised terms, seasonally-adjusted data, quarterly data



Sources: Bureau of Economic Analysis, Eurostat, Statistics Sweden and the Riksbank

Figure 2:10. Policy rates

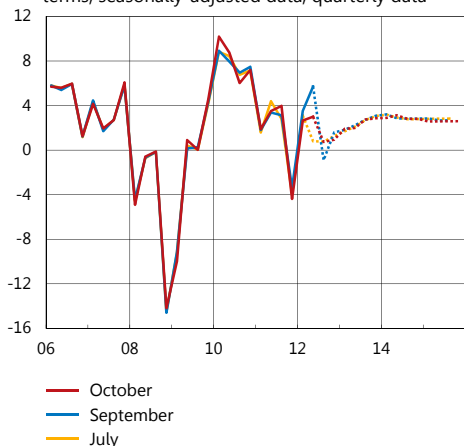
Per cent, daily data



Source: Reuters EcoWin

Figure 2:11. GDP forecasts in July, September and October 2012

Quarterly changes in per cent calculated in annualised terms, seasonally-adjusted data, quarterly data



Sources: Statistics Sweden and the Riksbank

However, the National Accounts for the first quarter indicated that growth in the Swedish economy at the start of the year had been significantly higher than expected. Stronger domestic demand seemed to have compensated for weak international demand. Nevertheless, the weaker developments in the euro area were judged to mean that growth on the Swedish export markets would be dampened in the period ahead (see Figure 2:9).

At the monetary policy meeting in July, the Executive Board of the Riksbank assessed that the relatively strong developments in Sweden justified holding the repo rate unchanged at 1.5 per cent, but at the same time considered that Swedish growth would be slightly weaker during the remainder of the year, which justified a downward adjustment in the forecast for the repo rate (see Figure 2:1).²⁰

■ Lower inflationary pressures and subdued growth – the repo rate was cut and the repo-rate path was lowered in September

In the summer, developments in the euro area continued to be marked by the sovereign debt crisis, and indicators suggested continued weak economic development in line with the Riksbank's forecast in July. The ECB had cut its policy rate by 0.25 percentage points in July, to 0.75 per cent (see Figure 2:10). However, the situation in the financial markets had improved slightly. Yields on government bonds issued by countries in Europe with sovereign debt problems remained high, but had fallen somewhat in conjunction with the signals from the ECB that it was prepared to take measures if the problems in these countries should worsen (see Figure 2:8).

As in the year's previous monetary policy decisions, at the beginning of September, the Executive Board of the Riksbank had to strike a balance between, on one hand, the precarious economic situation in the euro area and its negative impact on Swedish exports and, on the other, the unexpectedly strong resilience shown by the Swedish economy (see Figure 2:11).

Compared with the prospects in July, several factors suggested that inflationary pressures would be lower in the period ahead. Above all, the Swedish krona had appreciated significantly over the summer (see Figure 2:12). Even if the Riksbank had long counted on a strengthening of the krona, among other reasons because of Sweden's strong economic development compared to other countries, this appreciation took place sooner than expected. Moreover, the preliminary National Accounts for the second quarter indicated that productivity was significantly higher than expected. The Riksbank thus deemed that the unexpectedly strong growth in GDP in the first six months would not contribute towards higher inflationary pressures. In light of this, the Riksbank's inflation forecast for 2013-2014 was revised downwards compared to the assessment in July (see Figure 2:13). The labour market had developed slightly better than expected, but the indicators pointed to a weakening

²⁰ Model-based analyses that were produced for the July meeting and which show effects of the debt crisis worsening and the financial unease abating soon are described in the article "Alternative scenarios for economic developments".

in the period ahead. The Riksbank's forecast for unemployment was therefore largely unchanged compared with the forecast in July.

To counteract the effects of the lower inflationary pressures, the Executive Board of the Riksbank decided to cut the repo rate by 0.25 percentage points to 1.25 per cent in September. The forecast for the repo rate was also adjusted downwards for the entire forecast period (see Figure 2:1).

■ Slower recovery in the labour market and lower inflationary pressures – repo-rate path lowered in October

Ahead of the monetary policy meeting in October, it was observed that the international economy had developed in line with the assessment in September. The unease on the financial markets had subsided further, partly as a result of new measures by the ECB. For example, the ECB decided to purchase bonds issued by countries granted financial support programmes. Despite this, significant uncertainty remained regarding how the long-term problems in the euro area should be solved. Growth in the euro area was expected to continue to be weak in the period ahead, dampening the prospects for Swedish exports.

With regard to economic developments in Sweden, the revised National Accounts figures in September showed that GDP growth in the first six months was significantly weaker than the earlier, preliminary statistics had suggested. Nonetheless, after the revision, the view of relatively strong Swedish growth in the first six months remained. However, the Riksbank's assessment of GDP growth in the period ahead was largely the same as in September (see Figure 2:11).

Employment had developed well during the year and was expected to continue to develop positively. Nevertheless, unemployment was expected to rise, as the number of people in the labour force was expected to increase more than the number of those employed. Moreover, there were signs that the matching on the labour market had deteriorated, that is, it had become more difficult for jobseekers to find vacant jobs.

The recovery of the labour market was thus assessed to take longer than had previously been expected (see Figure 2:14). The upward revision to the Riksbank's forecast for unemployment thus reflected both a weaker economic situation and poorer matching. Compared with the assessment in September, inflation was now expected to be slightly lower during the coming year (see Figure 2:13). This was mainly due to lower energy prices.

At the monetary policy meeting in October the Executive Board of the Riksbank decided to make a relatively large downward adjustment to the forecast for the repo rate (see Figure 2:1), which was justified by the lower inflationary pressures and the expected poorer development in unemployment. It was assessed that the repo rate would need to be low for a longer time to stimulate the economy and bring inflation in line with the target. At the same time, the repo rate was left unchanged at 1.25 per cent. As monetary policy affects the economy with a time lag, an immediate repo-rate cut would probably have little effect on the low

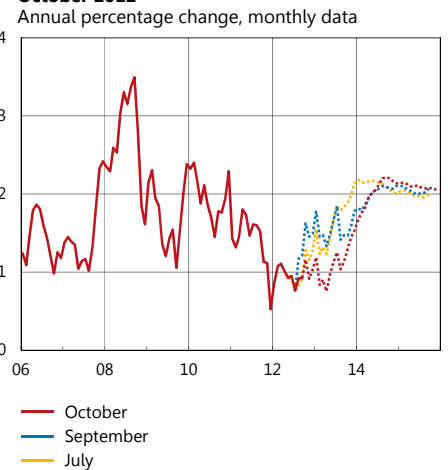
Figure 2:12. TCW-weighted nominal exchange rate Index, 18 November 1992 = 100, daily data



Note. TCW refers to a weighting of Sweden's most important trading partners.

Source: The Riksbank

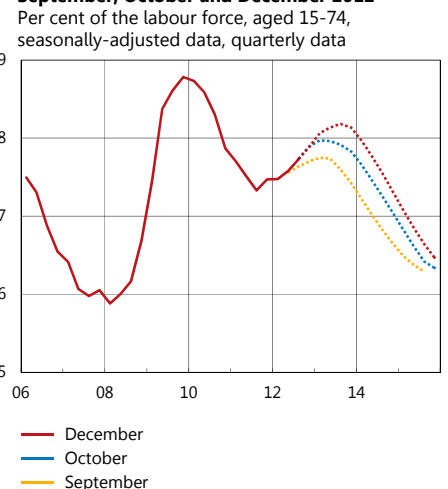
Figure 2:13. CPIF, forecasts in July, September and October 2012



Note. The CPIF is the CPI with a fixed mortgage rate.

Sources: Statistics Sweden and the Riksbank

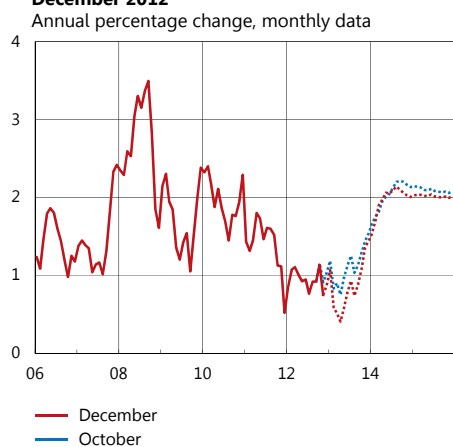
Figure 2:14. Unemployment, forecasts in September, October and December 2012



Note. Outcomes refer to data published before labour force surveys (AKU) published revised statistics for the development of the labour market 2010-2012. See footnote 33 for further information.

Sources: Statistics Sweden and the Riksbank

Figure 2:15. CPIF, forecasts in October and December 2012



Note. The CPIF is the CPI with a fixed mortgage rate.
Sources: Statistics Sweden and the Riksbank

inflation and level of economic activity in the year ahead. If both the forecast for the repo rate and the repo rate were cut, however, CPIF inflation would risk overshooting the target a few years later.²¹

■ Clear slowdown in the Swedish economy at the end of the year – the repo rate was cut and the repo-rate path was lowered in December

Developments abroad continued to weigh the Swedish economy down at the end of the year. Uncertainty over developments in the euro area remained very high, but the situation on the financial markets had stabilised and was largely unchanged since the end of October.

The negative effects of the weak developments abroad on the Swedish economy turned out to be greater than the Riksbank had previously expected. According to the National Accounts, the Swedish economy had grown more rapidly in the third quarter than the Riksbank had expected in October, but it was clearly apparent that both exports and important areas of domestic demand, such as household consumption and corporate investment, were developing more weakly than expected. The National Institute of Economic Research's Economic Tendency Survey indicated that confidence in economic development in the period ahead had fallen over a broad front (see Figure 2:7). The labour market situation had also deteriorated and the number of redundancy notices had increased relatively rapidly. The Riksbank's overall assessment was that GDP would increase more slowly and unemployment would be higher than had been expected in October (see Figure 2:14). At the same time, inflation was expected to be lower (see Figure 2:15). The downward adjustment of the inflation forecast was primarily due to lower energy prices. The weaker labour market situation, together with the demands presented in the central wage negotiations in November, also suggested moderate wage increases and low inflation during 2013-2015.

Given the lower inflationary pressures and the weaker economic outlook, the Executive Board of the Riksbank decided in December to cut the repo rate by 0.25 percentage points to 1.0 per cent. At the same time, the forecast for the repo rate was adjusted downwards (see Figure 2:1).

Important issues in the monetary policy discussion 2012

The Executive Board of the Riksbank was agreed that the low inflationary pressures and the weaker economic outlook justified more expansionary monetary policy. The Board assessed that a more expansionary monetary policy was necessary to attain the inflation target and to contribute to a gradual normalisation of resource utilisation. However, there were differing opinions as to how much the repo rate and repo-rate path should be cut. Two Executive Board members consistently advocated an

²¹ Model-based analyses that were produced for the October meeting and which show how various driving forces behind GDP growth affect inflation are included in the article "Alternative scenarios for economic developments".

even more expansionary monetary policy in order for the inflation forecasts to approach the target sooner and the unemployment forecasts to be lower (all decisions and reservations are described in the box Monetary policy decisions and reservations 2012). However, most of the Executive Board members had a different view of what constituted appropriate monetary policy and what risks should be taken into account.

The different assessments reflected, for instance, differences in the views of risks linked to household indebtedness, views on the Swedish labour market and on the capacity of monetary policy to further reduce unemployment. There were also differing opinions on whether the impact of monetary policy on the economy had changed during the crises in recent years and if so, what a slower impact might entail for how active monetary policy should be. There were also partly differing assessments regarding, for instance, the growth outlook in the euro area and the development of policy rates abroad.

■ Developments on the Swedish labour market

The labour market situation is an important part of the assessment of resource utilisation in the economy and is an indicator of inflationary pressures. In the short run, monetary policy can contribute to reducing the part of unemployment that is due to a cyclical downturn by stimulating the economy. The long-run sustainable unemployment rate is thus determined by structural factors, such as demographic conditions and the rules and functioning of the labour market.²² Monetary policy is thus not able to lastingly reduce actual unemployment below its long-run sustainable level.

A central element in the analysis of the functioning of the Swedish labour market is to assess how demographic changes and government reforms since 2006 have affected the long-run sustainable rate of unemployment.²³ The Riksbank's analyses in 2012 showed that the uncertainty over the level of long-term unemployment is significant and resulted in the conclusion that long-run sustainable unemployment could be in the interval 5-7.5 per cent.²⁴ It is uncertain, for instance, how the long-run sustainable rate of unemployment is affected by new groups with a weaker position in the labour market entering the labour force. These new groups may find it much more difficult to obtain work than those who have earlier been part of the labour force.

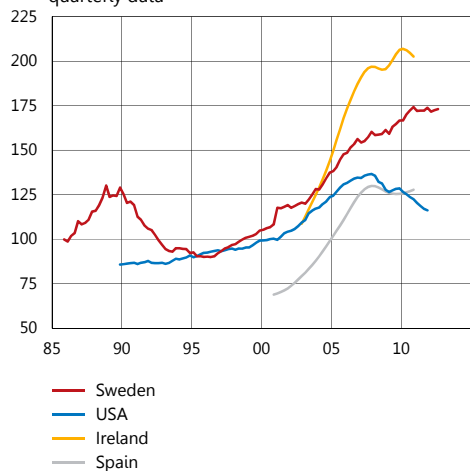
As mentioned earlier, monetary policy became more expansionary over the course of the year. However, there were differing opinions as to how much a lower repo rate could contribute to reducing unemployment. Several members of the Executive Board considered that monetary policy had only limited capacity in this respect. They said that monetary policy was already clearly expansionary and thus contributed to an improvement on the labour market, and that even with a more expansionary policy it would be difficult to attain a much lower rate of

²² However, the long-run sustainable rate of unemployment cannot be observed but must be estimated.

²³ See the article "the Riksbank's development work 2012-2013".

²⁴ According to Deputy Governor Lars E.O. Svensson's preliminary assessment, the long-run sustainable rate of unemployment is around 5.5 per cent. See *Minutes of monetary policy meeting* July 2012, Appendix 2.

Figure 2:16. Household debt
Total debt as a percentage of disposable income, quarterly data



Note. Data for Ireland and Spain comes from Eurostat, for the United States from the Bank of England and for Sweden from the Riksbank. When Eurostat calculates the debt ratio, disposable income is adjusted for changes in the households' pension savings. The adjustment generally entails an increase in disposable income, which leads to a lower debt ratio.

Sources: Bank of England, Eurostat and the Riksbank

unemployment during the coming years because of the less efficient matching between vacancies and job-seekers. Monetary policy is not able to do anything about this structural rigidity.

Other members felt that a more expansionary monetary policy could push unemployment down, despite signs of worsened matching on the labour market and a greater proportion of inexperienced workers among the unemployed. The justification for this opinion was that matching for inexperienced labour and employment for vulnerable groups seems to be more cyclically-sensitive than it is for other groups in the labour market. They also felt that a more expansionary monetary policy could bring down long-term unemployment and reduce the tendency for unemployment to become entrenched.

The discussion on developments in the labour market cannot be regarded in isolation from other deliberations. The different opinions on how expansionary monetary policy should be also reflected differences in the view of risks related to household indebtedness and to what extent monetary policy can and should be used to limit these risks.

■ House prices and household indebtedness

Several members of the Executive Board felt that the risks linked to household indebtedness were sufficiently large that they should be given consideration in the monetary policy decisions. Although lending to households increased at a slower rate, partly due to the introduction of the mortgage cap and the monetary policy conducted in recent years, households' debt ratios were still at a high level from both historical and international perspective (see Figure 2:16).

Two Board members felt, however, that household debt did not justify a tighter monetary policy than the one following from the targets of stabilising inflation around the inflation target and unemployment around a long-term sustainable level. For one thing, the household debt ratio had stabilised recently as a result of the increase in house prices and household credits dampening. For another thing, the possible risks associated with household indebtedness would be better handled using other means than the repo rate, such as the mortgage cap, regulations on tax deductions for interest payments and risk weighting on mortgages. One member argued that research supports the view that monetary policy normally has only very small short-term effects on indebtedness and – assuming that inflation is low and stable – no long-term effects on indebtedness. Both board members considered that a monetary policy not aimed at stabilising inflation around the target and unemployment around a long-run sustainable level would risk becoming unclear and leading to a fall in inflation expectations.

Most members of the Executive Board felt, however, that there was a risk that an even more expansionary policy would lead to a return to a more rapid build-up of debt and continuing price increases in the housing market, which would not be sustainable in the long run. In the same way as in many other countries, this could later on lead to severe price falls in the housing market. If households increase their savings in this type of situation to restore their wealth, it could have serious

consequences for the economy in the form of a longer period with weak demand, high unemployment and inflation below the target. By holding the repo rate slightly higher, it was estimated that this risk would be reduced to some extent and there would be a greater chance of better target fulfilment in the long run. The view that monetary policy has only limited effects on housing prices and household indebtedness was also questioned. It was argued that the impact of monetary policy on housing prices and household indebtedness varies over time. The impact can depend, for instance, on how clear the central bank is regarding the risks it sees in connection with housing prices and household indebtedness. If the central bank signals that it perceives a particular development to be worrying, it may be possible to influence behaviour without having to raise the policy rate substantially. Most of the members of the Executive Board also felt that even if other means than the repo rate might be better suited to manage the problems of high indebtedness among households, there was still no clear framework determining how and by whom these means should be used.

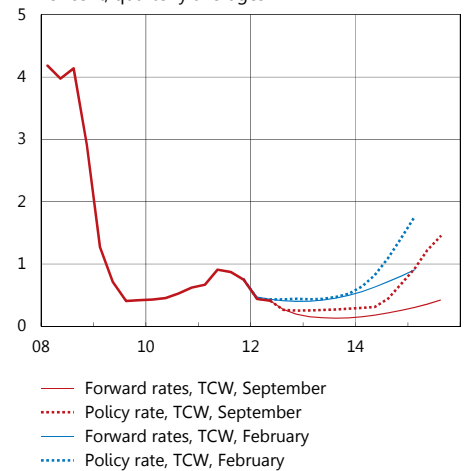
■ Has the impact of monetary policy slowed down?

Another question in the monetary policy discussion is whether the impact of monetary policy on the Swedish economy had been slowed down by the prevailing crisis and what this would entail for how active monetary policy should be. Some members felt that the low confidence among the participants in the economy was mainly connected to international developments. It was very uncertain how great an effect a repo-rate cut would have on corporate investment. This was also thought to apply to effects on household consumption. A more expansionary monetary policy would in that case have a delayed impact that would not be felt until the end of the forecast period, when inflation was close to the target and resource utilisation close to normal. Other members thought instead that the reduced effect was a reason for larger and earlier repo-rate cuts. They felt that if these larger repo-rate cuts would risk leading to excessively high inflation, monetary policy could be tightened again at a later stage.

■ Policy rates abroad and effects on the exchange rate and inflation

The Riksbank's forecast for policy rates abroad were a recurring theme in the monetary policy discussion. Some members were critical to the forecasts being higher than monetary policy expectations estimated on the basis of pricing on the forward market, even though this deviation does not arise until the end of the forecast period (see Figure 2:17). According to these members, lower forecasts for policy rates abroad even relatively far ahead would lead to forecasts of a stronger krona and lower inflation, which in turn would favour a lower path for the repo rate than the Riksbank forecasts. They argued that to the extent the forecasts deviate from monetary policy expectations estimated on the basis of pricing on the forward market, this deviation must be justified. Other

Figure 2:17. Policy-rate forecasts and forward rates abroad, February and September 2012
Per cent, quarterly averages



Note. Forward rates from 8 February 2012 and 31 August 2012. Forward rates are adjusted for average risk premiums corresponding to one basis point per month of the maturity period.

Sources: National sources, Reuters EcoWin and the Riksbank

members said that the forecasts for policy rates abroad were reasonable, given the difficulties in estimating monetary policy expectations on the basis of pricing on the forward market and their significance for the exchange rate. Some also considered that as it was not until the end of the forecast period, several years from now, that the Riksbank's forecast for policy rates abroad differed to any great extent from pricing on the forward markets, the deviation was not particularly important to the forecast.

■ **Alternative repo-rate scenarios**

Some members' opinion that a lower repo-rate path would have comprised a better-balanced monetary policy over the year can be illustrated with the help of the alternative repo-rate scenarios made using the macroeconomic model, Ramses, and published in the monetary policy reports. The analysis aimed to illustrate the effects of a different monetary policy than the one described in the main scenario. According to these alternative scenarios, a lower repo-rate path would have meant that CPIF inflation would reach 2 per cent slightly sooner than in the main scenario and resource utilisation would normalise somewhat earlier.

However, most Executive Board members did not find it reasonable to choose a repo-rate path solely on the basis of the information in these scenarios. The scenarios do not reflect all of the factors taken into account in the monetary policy decisions, for instance, factors outside of the model used to analyse the repo-rate scenarios or risks that may be difficult to quantify in the forecasting work (see the article "A method for comparing different monetary policy alternatives").

Monetary policy decisions and reservations 2012

15 February The repo rate was cut by 0.25 percentage points to 1.50 per cent. The repo-rate path was adjusted downwards. The new repo-rate path entailed the repo rate remaining at 1.50 per cent until the first quarter of 2013, after which it would gradually be raised to 3 per cent at the end of the forecast period. Deputy Governors Karolina Ekholm and Lars E. O. Svensson entered reservations against the decision to cut the repo rate to 1.50 per cent and against the repo-rate path in the Monetary Policy Report. They both advocated cutting the repo rate to 1.25 per cent and significantly lower repo-rate paths than in the Monetary Policy Report. They argued that their lower respective repo-rate paths would result in a better-balanced monetary policy with CPIF inflation closer to 2 per cent and a faster reduction of unemployment towards a longer-run sustainable rate. They also said that the forecast for overseas policy rates was too high. Mr Svensson was also of the opinion that the forecasts for growth in the euro area and resource utilisation in Sweden were too high.

17 April The repo rate was held unchanged at 1.50 per cent. The forecast for the repo rate was held unchanged. Deputy Governors

Karolina Ekholm and Lars E. O. Svensson entered reservations against the decision to hold the repo rate unchanged and against the repo-rate path in the Monetary Policy Report. They both advocated cutting the repo rate to 1.25 per cent and significantly lower repo-rate paths. They argued that their lower respective repo-rate paths would result in a better-balanced monetary policy with CPIF inflation closer to 2 per cent and a faster reduction of unemployment towards a longer-run sustainable rate. In addition, Mr Svensson was of the opinion that the forecasts for overseas policy rates and growth in the euro area were too high.

3 July The repo rate was held unchanged at 1.50 per cent. The forecast for the repo rate was adjusted downwards. According to the new repo-rate path, the repo rate should remain at 1.50 per cent until the third quarter of 2013, after which it would gradually increase to 3.1 per cent at the end of the forecast period. Deputy Governors Karolina Ekholm and Lars E. O. Svensson entered reservations against the decision to hold the repo rate unchanged and against the repo-rate path in the Monetary Policy Report. They both advocated cutting the repo rate to 1.0 per cent and significantly lower repo-rate paths than in the Monetary Policy Report. They motivated their reservations in the same manner as in April.

6 September The repo rate was cut by 0.25 percentage points to 1.25 per cent. The forecast for the repo-rate path was adjusted downwards. According to the new forecast, the repo rate would remain at 1.25 per cent until the middle of 2013, after which it would gradually be raised to 2.9 per cent at the end of the forecast period. Deputy Governor Karolina Ekholm entered a reservation against the repo-rate path and advocated a significantly lower repo-rate path. Deputy Governor Lars E. O. Svensson entered reservations against the Monetary Policy Update and the decision about the repo rate and the repo-rate path in the Monetary Policy Update. He advocated cutting the repo rate to 1.0 per cent and a significantly lower repo-rate path in line with his earlier proposals in the year. Ms Ekholm and Mr Svensson motivated their reservations in the same manner as in April and July.

26 October The repo rate was held unchanged at 1.25 per cent. The forecast for the repo-rate path was adjusted downwards. According to the new forecast, it was more likely that the repo rate would be cut than raised in the period ahead. In addition, compared with the forecast in September, increases in the repo rate were expected to start at a later date and at a slower pace. Towards the end of the forecast period, the repo rate was expected to amount to about 2.6 per cent. Deputy Governor Karolina Ekholm entered a reservation against the decision to hold the repo rate unchanged and against the repo-rate path in the Monetary Policy Report. She advocated cutting the repo rate to 1.0 per cent and a significantly lower repo-rate path. Deputy Governor Lars E. O. Svensson entered reservations against the Monetary Policy Report and the decision on the repo rate and the repo-rate path in the Monetary

Policy Report. He advocated cutting the repo rate to 0.75 per cent and a significantly lower repo-rate path. Ms Ekholm and Mr Svensson motivated their reservations in the same manner as in April, July and September.

17 December The repo rate was cut by 0.25 percentage points to 1.0 per cent. The repo-rate path was adjusted downwards. According to the new repo-rate path, the repo rate should remain at 1.0 per cent until the end of 2013, after which it would gradually increase to 2.5 per cent by the end of the forecast period. Deputy Governor Karolina Ekholm entered a reservation against the repo-rate path in the Monetary Policy Update and advocated a significantly lower repo-rate path. Deputy Governor Lars E. O. Svensson entered reservations against the Monetary Policy Update and the decision on the repo rate and repo-rate path. He advocated cutting the repo rate to 0.75 per cent and a significantly lower repo-rate path. Ms Ekholm and Mr Svensson motivated their reservations in the same manner as in April, July, September and October. Alongside this, Mr Svensson said that the forecast for Swedish inflation in the Monetary Policy Update was too high. In addition, he considered that his lower repo-rate path would not have a noticeable effect on household indebtedness as monetary policy normally only has very minor short-term effects on indebtedness and, with low and stable inflation, no long-term effects of this kind.

■ Economic developments 2010-2011

The recovery from the global financial crisis continued in 2010 and the first six months of 2011. Growth in Sweden was higher than in many other countries and the repo rate was raised from the very low levels connected with the crisis. The international economic prospects deteriorated in the second half of 2011. This was expected to also dampen growth in Sweden and consequently the repo rate was cut at the end of the year.

International economic activity improved during 2010

In 2010, economic activity abroad continued to improve and world trade increased. However, developments still differed greatly from region to region. Asia still accounted for a large share of the increase in demand.

However, the recovery was supported by extensive economic policy measures by governments and central banks around the world, which meant that budget deficits in several countries increased. During the spring, concerns over public finance problems in certain countries in the euro area intensified and rates for government bonds issued by these countries increased (see Figure 2:18). The unease increased when Greece and eventually also Ireland and Portugal experienced difficulties borrowing on the international bond markets and were forced to accept help from the EU and the International Monetary Fund (IMF).

During the autumn, the financial markets continued to be marked by the sovereign debt problems in the euro area. In the United States, economic activity strengthened at the beginning of the year, but during the summer there were signs that the US economy had not developed as strongly as first believed and uncertainty arose over continued developments.

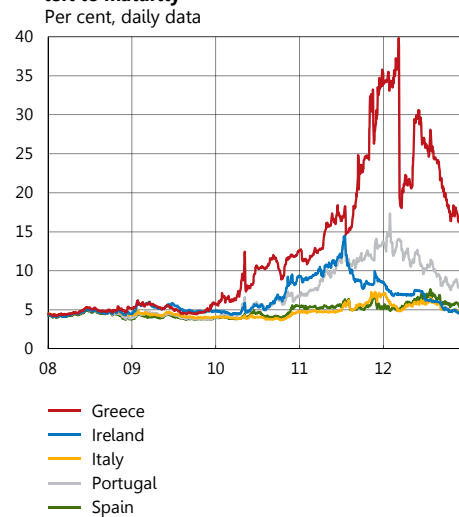
Strong recovery in the Swedish economy 2010

During 2010, Swedish GDP increased by 6.6 per cent. The upswing was broad, and all components of GDP developed strongly. The increase was mainly due to the recovery in world trade and a strengthening in global activity, which benefitted Swedish exports and Swedish investment. Exports were also boosted by the fact that the krona was very weak in 2009 and parts of 2010 (see Figure 2:12). Domestic demand also developed well and optimism regarding the future was strong among households and companies. GDP growth was significantly higher in Sweden than in the United States and the euro area.

Inflation measured in terms of the CPI, which had fallen rapidly in 2009 as a result of the Riksbank's crisis-related repo-rate cuts, increased and amounted to 1.2 per cent over the year. The increases in the repo rate during the second half of the year contributed to the rise in the CPI. Measured in terms of the CPIF, that is, the CPI with a fixed mortgage rate, inflation was on average 2.0 per cent in 2010 (see Figure 2:19).

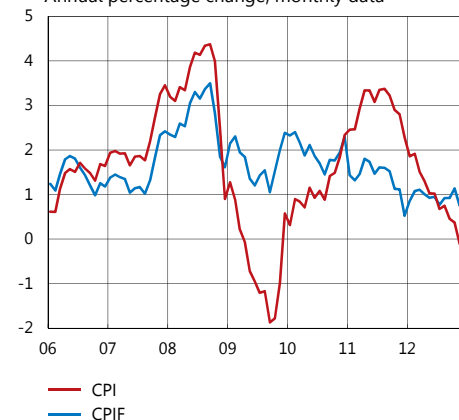
The Riksbank left the repo rate unchanged at 0.25 per cent up to the end of June 2010. The Riksbank started to raise the repo rate over the second half of the year; it was raised by 0.25 percentage points on four

Figure 2:18. Government bond rates with 10 years left to maturity



Source: Reuters EcoWin

Figure 2:19. CPI and CPIF
Annual percentage change, monthly data



Note. The CPIF is the CPI with a fixed mortgage rate.
Source: Statistics Sweden

occasions. Another part of the normalisation of monetary policy was that the extraordinary loans at fixed interest rates matured over the year and were not renewed by the Riksbank.

Relatively good growth in the global economy 2011

At the start of 2011, the recovery of the world as a whole continued, but regional differences remained. The emerging markets in Asia grew at a rapid pace, which contributed to the increase of energy and commodity prices on the global market. Economic activity and inflation also increased in the euro area, which led the ECB to raise its policy rate for the first time in two years (see Figure 2:10). However, there was uncertainty concerning the sustainability of the public finances of several European countries. In the United States, the economic outlook improved during the spring, but GDP growth turned out to be weaker than expected in the first six months.

Global growth prospects deteriorated over the second half of 2011 as unease over the sovereign debt problems in the United States and the euro area increased. The tightening of fiscal policy was expected to be comprehensive and to dampen developments in several countries. The poorer economic prospects in the euro area contributed to the debt-servicing ability of several countries being called into question. Government bond yields in Greece and Portugal increased substantially and yields in Italy and Spain increased to historically high levels at times, despite continued rescue purchases by the ECB (see Figure 2:18). Uncertainty over the future led to increased pessimism among households and companies. It also had an impact on the stock exchanges, which fell heavily (see Figure 2:3). At the end of the year, the situation in the US economy looked brighter in the short term, but the poorer growth prospects in the euro area were eventually expected to have a negative effect on the United States.

GDP growth was stronger in Sweden than in many other countries in 2011

During 2011, Swedish GDP increased by 3.7 per cent. The upturn was broad and partly due to an increase in exports and partly to strong domestic demand. GDP growth was higher and the recovery proceeding at a faster rate in Sweden than in many other countries. One favourable factor here was that Sweden had relatively good public finances, which meant that there was no need for fiscal policy tightening. However, declining economic activity abroad started to have an increasingly apparent impact on the Swedish economy. At the end of the year, there were clear signs that growth had slowed down substantially, partly as a result of reduced demand for Swedish export goods.

CPI inflation amounted to an average of 3.0 per cent in 2011. Higher interest rates and higher energy prices led the CPI to increase over the first six months of 2011. During the autumn, prices of both goods and services increased at a much slower rate and CPI inflation retreated. Measured in terms of the CPIX, inflation was 1.4 per cent over the year (see Figure 2:19).

Over the first six months of 2011, the Riksbank raised the repo rate from 1.25 per cent at the beginning of the year to 2 per cent in early July. The decision was taken in order to stabilise inflation close to the inflation target and simultaneously avoid excessive resource utilisation later on. However, as developments abroad were weak in the autumn and were expected to dampen growth in Sweden too, the Riksbank refrained from carrying out any further planned repo-rate increases. Instead, it was decided to cut the repo rate by 0.25 percentage points in December. At this point, the economic outlook abroad had clearly been weakened and the Swedish economy had started to slow down. Over the autumn, the repo-rate path was also successively revised downward.

■ Alternative scenarios for economic development

A number of alternative scenarios for economic development are published in the Monetary Policy Reports. The aim of these scenarios is to shed light on some of the current risks addressed by the monetary policy discussion. The scenarios are usually based on the analysis developed with the aid of the Riksbank's macroeconomic model Ramses. This article describes scenarios published in the Reports in 2012.

Alternative scenarios in February

Ahead of the monetary policy meeting in February, the Riksbank analysed the effects on the Swedish economy of different developments of the krona exchange rate and of the international economy. The first scenario focused on poorer developments abroad in combination with a depreciation of the Swedish krona, as experiences from earlier crisis periods show that the krona usually depreciates when international economic activity declines. A weaker exchange rate makes Swedish export goods relatively cheaper, counteracting the effects of the weak growth abroad and thereby dampening the fall in resource utilisation. When the krona depreciates, import prices in Swedish krona also become higher. Prices for domestic production with imported input goods thereby also increase. The downturn in economic activity in itself entails a reduction of inflationary pressures in Sweden, but the effects of the exchange rate dominate, making inflation higher than in the main scenario.

If the exchange rate instead appreciates at the same time as developments abroad deteriorate, Swedish-produced goods will become more expensive and the negative effects on resource utilisation will be amplified. Inflationary pressures will also become lower. Such a development of the exchange rate would require the Riksbank to hold the repo rate lower than if the exchange rate were instead to be weakened.

Another scenario was based on a faster resolution of the sovereign debt crisis abroad than was assumed in the main scenario, with growth abroad being higher at the same time as the krona depreciated. If resource utilisation were to increase more rapidly and inflation to become higher, the Riksbank would need to raise the repo rate.

Alternative scenarios in July

In an alternative scenario in July, the Riksbank examined the effects of a deepened sovereign debt crisis in Europe. The weaker economic climate abroad would then mean that both inflation and resource utilisation in Sweden would become lower than in the main scenario. In this scenario, the repo rate would be cut to counteract the negative effects on inflation and resource utilisation.

In another alternative scenario, the Riksbank focused on the effects of a faster weakening of financial unease than in the main scenario. Consumer confidence would then return earlier and companies would

start to invest and recruit at a faster pace. In this scenario, resource utilisation and inflation would be higher than in the main scenario, and the need for an expansionary monetary policy would not be as great.

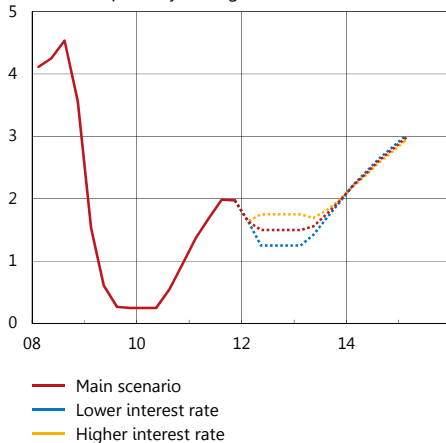
Alternative scenarios in October

Before the monetary policy meeting in October, the Riksbank analysed how monetary policy should react to surprises in GDP growth. The aim was to show that the monetary policy response may vary depending on the factors driving higher (or lower) growth. For example, preliminary statistics showed that GDP had increased substantially in the second quarter. Despite this, the Riksbank cut the repo rate at the meeting in September. This was because this unexpectedly strong growth had developed hand-in-hand with unexpectedly high productivity growth and was thereby deemed not to be driving inflation. If high GDP growth is due to an increase in labour productivity, the costs for companies will be lower, resource utilisation will be dampened and inflation will decrease. To counteract reduced resource utilisation and excessively low inflation, the repo rate would then have to be cut to a lower level than in the main scenario.

If increased demand instead lies behind high GDP growth, resource utilisation will increase. Increased demand for labour will lead to higher wages and, ultimately, to higher inflation. In this case, the repo rate would need to be increased at a faster pace than in the main scenario to prevent inflation rising above the target.

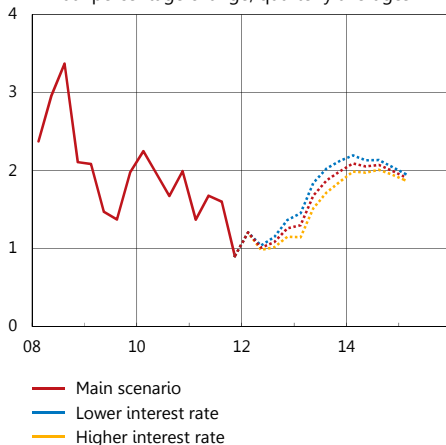
■ A method for comparing different monetary policy alternatives

Figure 2:20. Different interest-rate assumptions, February 2012
Per cent, quarterly averages



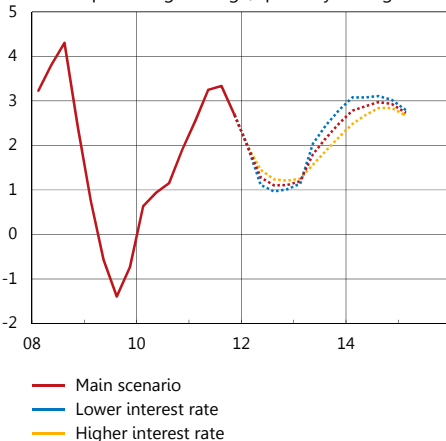
Source: The Riksbank

Figure 2:21. CPIF, forecasts in February 2012
Annual percentage change, quarterly averages



Note. The CPIF is the CPI with a fixed mortgage rate.
Sources: Statistics Sweden and the Riksbank

Figure 2:22. CPI, forecasts in February 2012
Annual percentage change, quarterly averages



Sources: Statistics Sweden and the Riksbank

According to the Sveriges Riksbank Act, the objective for monetary policy is to maintain price stability. The Riksbank has specified this as a target for CPI inflation of 2 per cent. Like most other inflation-targeting central banks, the Riksbank also strives to stabilise the real economy, that is output and employment. It is therefore important that monetary policy alternatives can be compared in both these dimensions. This article presents a method for making such comparisons. Limits of the method are also discussed.

A way of comparing different interest-rate paths

One complication in making *ex post* assessments of monetary policy is that the economy is constantly affected by unanticipated shocks. These can mean that inflation and the real economy end up relatively far from expectations, even though the forecasts made and the monetary policy decisions taken were reasonable and well-founded at the time. The method for comparing different monetary policy alternatives described here is instead forward-looking and studies the situation *ex ante*. It aims to describe the decision-making situation that the Riksbank faces and attempts to investigate how well-founded various monetary policy alternatives were, given the information available when the decision was taken.

Every time the Executive Board makes a monetary policy decision, it assesses the repo-rate path needed for monetary policy to be well-balanced. It is normally a question of finding an appropriate balance between stabilising the forecast for inflation around the inflation target and stabilising the forecast for the real economy.²⁵ The stabilisation of the real economy is normally assessed in terms of various measures of resource utilisation. As there is no generally-accepted view of how resource utilisation should be measured, the Riksbank uses a number of different indicators and statistical methods to assess resource utilisation and how it will develop over the next few years. For example, this could concern unemployment in relation to the level deemed to be sustainable over the long term, or GDP, employment or hours gaps, that is the deviation of each of these variables from its long-term trend.

Each given repo-rate path or forecast for the repo rate is compatible with certain forecast paths for inflation and the real economy. The Monetary Policy Reports normally present three different repo-rate scenarios. These scenarios are produced with the help of Ramses, the macroeconomic model of the Swedish economy that is used to produce background material and data for the Riksbank's forecasts and monetary policy decisions.²⁶ Figure 2:20 shows the Riksbank's main scenario and two alternative scenarios with lower and higher policy rates respectively

²⁵ See *Monetary Policy in Sweden* for a detailed description of the Riksbank's monetary policy strategy. The document is available as a PDF file on the Riksbank's website, www.riksbank.se, under the heading Monetary policy/Price stability.

²⁶ For a description of the model, see Adolphson Malin, Stefan Laséen, Lawrence Christiano, Mathias Trabandt and Karl Walentin, "Ramses II – Model Description", Occasional Paper no. 12, 2013, Sveriges Riksbank.

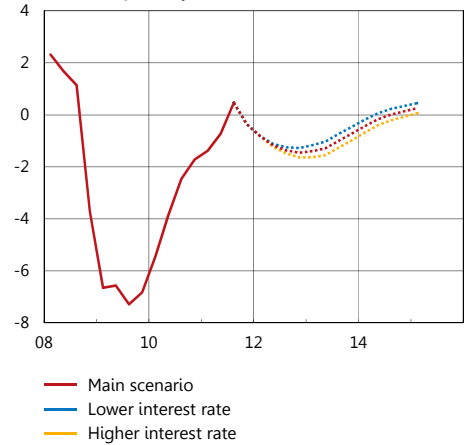
from the Monetary Policy Report published in February 2012.²⁷ Figure 2:21 illustrates the forecasts for the CPIF based on the different repo-rate paths. According to the results, the lower repo-rate path would have entailed CPIF inflation reaching 2 per cent faster than in the main scenario, and subsequently being just above two per cent in 2014. According to all repo-rate paths, CPI inflation should be close to 3 per cent at the end of the forecast period (see Figure 2:22).²⁸ Figures 2:23 and 2:24 show the forecasts for the GDP gap and unemployment based on the main scenario and the alternative repo-rate paths. All of the paths suggest that resource utilisation according to both measures should have decreased in 2012 and have been below its normal level. With the lower interest rate path, resource utilisation should have been somewhat higher during the forecast period and have normalised slightly earlier than in the main scenario.

This type of figure can be used to compare the consequences of different repo-rate scenarios. However, the figures do not always make it obvious which repo-rate path best stabilises both inflation and the real economy. To summarise the information in the figures and facilitate a comparison, the 'mean squared gap' can be calculated. First, for a particular repo-rate path the square of the deviation, or 'the gap', between the inflation target and the forecast for inflation is measured for each quarter three years ahead. The mean squared gap for inflation is obtained by averaging these squared deviations. The mean squared gap for the forecast for the real economy is measured in a corresponding manner.

Thus a particular repo-rate path is linked to two numbers – two mean squared gaps. These can then be drawn as a point in a figure. As an example, the mean squared gaps are shown first for the unemployment gap and CPIF inflation.²⁹ Figure 2:25 shows the mean squared gaps for the three different repo-rate scenarios in the Monetary Policy Report published in February 2012. The smaller the mean squared gaps are, the smaller the deviation is between inflation and the inflation target, and the smaller the unemployment gap is, measured as averages over the forecast period. A point in the figure close to origo, that is far down and far to the left ('southwest' in the figure), thus indicates a strong stabilisation of both inflation and resource utilisation. According to the mean squared gaps in Figure 2:25, the alternative with a lower repo rate gives a better result than the other two alternatives if the analysis is based on the unemployment gap and CPIF inflation.

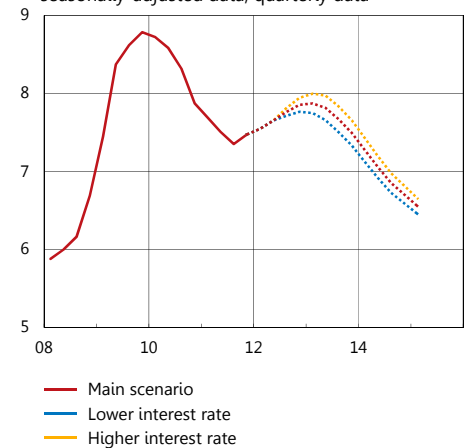
As a second example, Figure 2:26 shows the mean squared gaps when inflation is measured with the CPI and resource utilisation is measured with the GDP gap. In this case, neither of the alternatives can be preferred ahead of the two others, as none of the alternatives has a mean squared gap that is smaller than any other alternative for *both*

Figure 2:23. GDP gap, forecasts in February 2012
Per cent, quarterly data



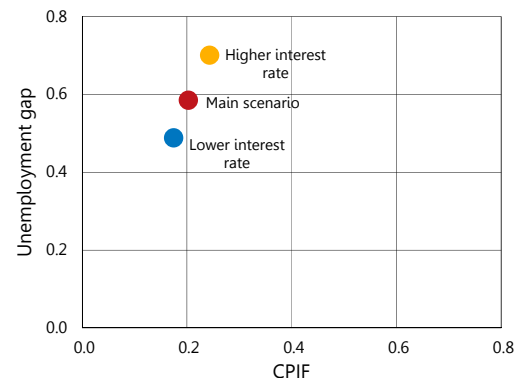
Note. Refers to the GDP deviation from trend, calculated using a production function.
Sources: Statistics Sweden and the Riksbank

Figure 2:24. Unemployment, forecasts in February 2012
Per cent of the labour force, aged 15-74, seasonally-adjusted data, quarterly data



Sources: Statistics Sweden and the Riksbank

Figure 2:25. Mean squared gap for forecasts of the unemployment gap and CPIF inflation, February 2012



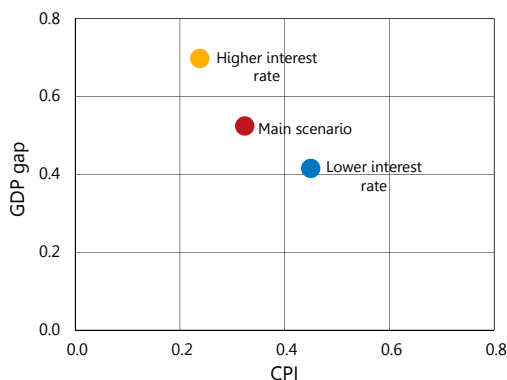
Note. Repo-rate assumptions and forecasts from the *Monetary Policy Report*, February 2012.
Source: The Riksbank

²⁷ The alternative repo-rate scenarios reported in the *Monetary Policy Reports* published in July and October give the same view of the monetary policy considerations. See Appendix, Figures A1–A10.

²⁸ As described in Chapter 2, a number of members of the Executive Board considered that the impact of monetary policy may have become slower as a result of the crisis. In this case, a more expansionary monetary policy would risk not having a clear impact until the end of the forecast period, and then leading to CPIF inflation also being significantly above the inflation target.

²⁹ The unemployment gap is the difference between unemployment and an estimated sustainable level of unemployment. In these calculations, 6.5 per cent is used as the long-term sustainable level of unemployment.

Figure 2.26. Mean squared gap for forecasts of the GDP gap and CPI inflation, February 2012



Note. Repo-rate assumptions and forecasts from the *Monetary Policy Report*, February 2012.

Source: The Riksbank

inflation and resource utilisation (no alternative lies 'south-west' of any other alternative). The choice between the different repo-rate paths thus depends on the importance placed on stabilising inflation as opposed to resource utilisation. If greater importance is ascribed to stabilising CPI inflation, the higher repo-rate path may be preferred, but if greater importance is placed on stabilising resource utilisation, it may be considered that the lower repo-rate path is better.

The preferred repo-rate path according to the mean squared gaps can thus vary depending on which measure of inflation and resource utilisation is used. When taking decisions, the members of the Executive Board can place different amounts of importance on different measures. However, in periods of large repo-rate fluctuations, the CPI is a more appropriate measure for describing the long-term development of inflation.³⁰

Limitations of the method

The method of comparing and assessing different monetary policy alternatives is relatively simple and intuitive, but it also has limitations.

One of these is that the method does not capture all of the factors that may be relevant for the monetary policy decision. Consequently, several members of the Executive Board consider that the method does not give a fair view of all of the considerations that must be made in different situations. For example, it is difficult to use the method to consider decision-makers' perception of the risks and uncertainty in the forecasts. As can be seen in Chapter 2, several members of the Executive Board argued that the risks associated with household indebtedness needed to be considered in the assessment of how expansionary monetary policy should be in 2012. In their assessment, this could well imply better target fulfilment seen over a longer perspective. There is currently no simple way of taking considerations of this nature into account within the framework of the method.

Even if the method needs to be complemented with assessments that take into account uncertainty and the importance of different kinds of risk, it constitutes a way of illustrating and illuminating different monetary policy alternatives. The Riksbank continues to develop the monetary policy analysis so as to better take into account factors that the current method cannot handle at the moment. An important part of this work is finding suitable ways of taking account of uncertainty and risks, for example as a result of household indebtedness.

³⁰ See the article "The CPI and other measures of inflation".

■ CHAPTER 3 – Target fulfilment

Both CPI and CPIF inflation were on average around 1 per cent in 2012. The fact that inflation was below the target was largely due to economic activity abroad being much weaker than expected and that this had an effect on the Swedish economy. Inflation expectations in the long term were close to 2 per cent, which shows that the public was still confident that the Riksbank would attain its inflation target.

Inflation 2012

On average, CPI inflation was 0.9 per cent in 2012 (see Table 3:1). The differences in average inflation between different measures of inflation were marginal. Measured in terms of the CPIF, that is, the CPI with a fixed mortgage rate, inflation was 1.0 per cent in 2012. While CPIF varied around 1 per cent during the year, CPI inflation fell from 1.9 per cent in January to -0.1 per cent in December (see Figure 3:1). The fall in CPI inflation was mainly due to the Riksbank gradually cutting the repo rate from December 2011. When the repo rate is raised or lowered substantially, large but transitory effects on CPI inflation arise through the impact of the repo rate on households' mortgage interest costs.³¹ Even adjusted for variations in energy prices, inflation measured in terms of the CPIF was on average 1.0 per cent in 2012, which is the same level as in 2011.³²

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

	2010	2011	2012
CPI	1.2	3.0	0.9
CPIF	2.0	1.4	1.0
CPIF excluding energy	1.5	1.0	1.0

Note. The CPIF is the CPI with a fixed mortgage rate.

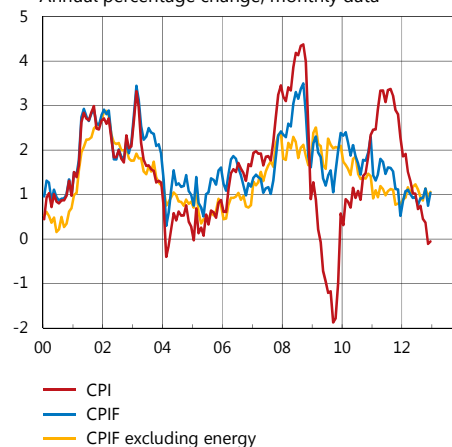
Source: Statistics Sweden

The development of the real economy in 2012

During 2012, GDP in Sweden increased by 0.8 per cent. This increase was less than the year before, when GDP rose by 3.7 per cent (see Table 3:2). This can be explained by the fact that demand for Swedish export goods declined substantially in 2012 as a result of the debt crisis in the euro area, where GDP fell by 0.5 per cent (see Figure 3:2). Swedish exports only increased by 0.7 per cent, which can be compared with an increase of 7.1 per cent in 2011. Domestic demand, on the other hand, was relatively strong over the year. Household consumption increased by 1.5 per cent, which is 0.6 percentage points less than in 2011.

The recovery in the labour market, which has been under way since the end of 2009, came to a halt at the end of 2011. The number of individuals employed continued to grow in 2012, but at a much slower rate than in 2011 (see Table 3:2). At the same time, the number of people

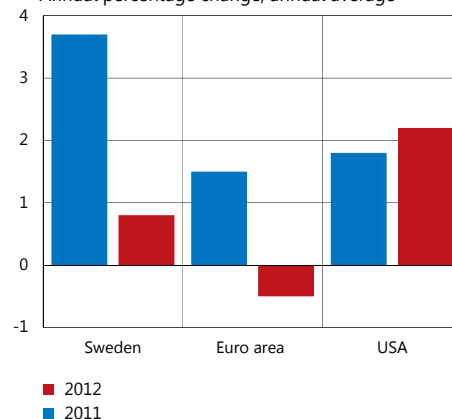
Figure 3:1. Development of inflation 2000-2012
Annual percentage change, monthly data



Note. The CPIF is the CPI with a fixed mortgage rate.

Source: Statistics Sweden

Figure 3:2. GDP growth in Sweden, the euro area and the United States, 2011 and 2012
Annual percentage change, annual average

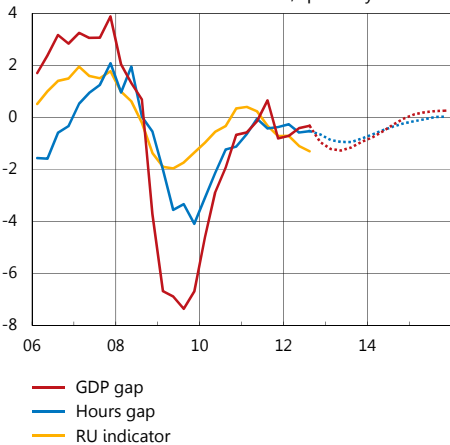


Sources: Bureau of Economic Analysis, Eurostat and Statistics Sweden

³¹ See the article "The CPI and other measures of inflation".

³² The article "The development of inflation in a longer perspective" analyses how inflation has developed during the period that Sweden has had an inflation target.

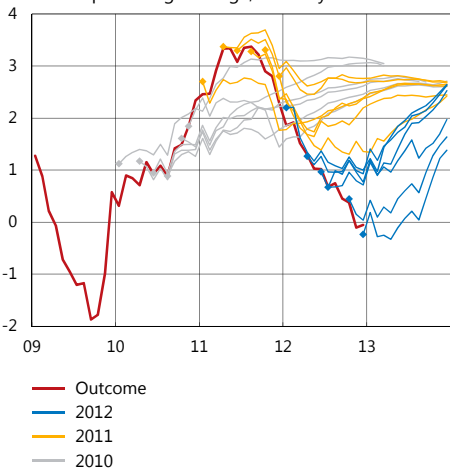
Figure 3.3. GDP gap, hours gap and RU indicator
Per cent and standard deviation, quarterly data



Note. The Riksbank's forecast from *Monetary Policy Update*, December 2012. GDP gap refers to the deviation from trend in GDP calculated using a production function. The hours gap refers to the deviation in the number of hours worked from the Riksbank's assessed trend for the numbers of hours worked. The RU indicator is normalised so that the mean value is 0 and the standard deviation is 1.

Sources: Statistics Sweden and the Riksbank

Figure 3.4. CPI, outcome and forecasts
Annual percentage change, monthly data



Note. The thin lines represent the Riksbank's forecasts 2010-2012. The marks show the starting point of each forecast and may therefore deviate from the latest outcome at that point in time.

Sources: Statistics Sweden and the Riksbank

Figure 3.5. CPIF, outcome and forecasts
Annual percentage change, monthly data



Note. See the note to Figure 3.4. The CPIF is the CPI with a fixed mortgage rate.

Sources: Statistics Sweden and the Riksbank

in the labour force has grown more quickly, which meant that unemployment rose to 8.0 per cent in 2012.³³

Table 3.2. Production and measures of employment 2010-2012, annual average
Annual percentage change

	2010	2011	2012
GDP	6.6	3.7	0.8
Employed, aged 15-74	0.5	2.3	0.6
Hours worked	2.6	2.4	-0.2
Unemployment, aged 15-74*	8.6	7.8	8.0

*Per cent of the labour force

Note. The labour force surveys (AKU) published revised statistics in February 2013 for labour market developments during 2010-2012, because of an improved reporting method. Outcomes for employed and unemployment refer to revised figures.

Source: Statistics Sweden

■ **Resource utilisation lower than normal**

A resource utilisation measure is often used as an overall measure of the development of the real economy. However, there is no clear-cut way to measure resource utilisation, and the Riksbank therefore uses a number of different measures. Examples of such measures are the GDP gap and the hours worked gap, which measure the percentage deviations of GDP and the number of hours worked from their respective sustainable long-term levels. If each measure is positive, this means that the level of activity and resource utilisation in the economy is higher than normal. The opposite applies when the measures are negative. One reason to use several measures to attain an overall picture of resource utilisation is that it is not possible to observe the long-run sustainable levels; they must be calculated in some way.

According to both the GDP gap and the hours worked gap, resource utilisation was somewhat lower than normal in 2012 (see Figure 3:3). The Riksbank's indicator of resource utilisation, known as the RU indicator, which summarises information from surveys and labour market data with the aid of a statistical method, also shows that resource utilisation was lower than normal in 2012 (see Figure 3:3).

Unemployment related to its long-run sustainable level is an additional measure of resource utilisation. However, it is uncertain where this level lies. The Riksbank's assessment is that it is in the interval of 5-7.5 per cent (see also Chapter 2). According to this assessment, unemployment was higher than its long-run sustainable level in 2012.³⁴

³³ The labour force surveys (AKU) published revised statistics in February 2013 for labour market developments during 2010-2012, because of an improved reporting method. According to the new statistics, unemployment was around 0.3 percentage points higher in 2010-2012 than was indicated by the statistics published earlier.

³⁴ The Riksbank's assessment regarding the interval for the long-run sustainable level is based on earlier AKU statistics, see also footnote 33.

Why did inflation deviate from the target in 2012?

One way of analysing the causes of the inflation's deviation from the inflation target is to use the Riksbank's forecasts for inflation and other variables from 2010 onwards as a base. By studying how the forecasts have changed over time and examining the reasons for the revisions, one can obtain an idea of what unexpected events have occurred during these years and what deliberations were made. This also provides a good picture of why inflation deviated from the target.

Figure 3:4 shows the actual development of the CPI and the Riksbank's forecasts for the CPI during the period 2010-2012. The development of the CPI and the Riksbank's forecasts for the CPI are shown in a corresponding manner in Figure 3:5. It is difficult but not entirely necessary to distinguish individual forecasts in the figures. The main purpose is to provide an overall picture of how the Riksbank's assessments have changed.

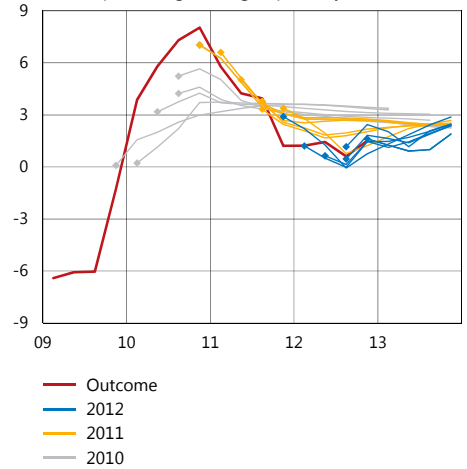
As observed at the beginning of this Chapter, the difference between CPI and CPIF inflation can be considerable during periods when the repo rate is raised or cut substantially. This has been the case in recent years. Figures 3:4 and 3:5 show, for instance, that while CPI inflation increased relatively strongly in 2010 and 2011 as a result of the Riksbank's interest rate increases, CPIF inflation fell, particularly in 2011.³⁵ In situations where repo-rate changes affect the CPI to a great extent, developments in CPIF inflation provide better guidance for monetary policy decisions.³⁶ The decisions made during 2010-2012 therefore focused to a large degree on the forecasts for inflation measured in terms of the CPIF.

■ The Riksbank's forecasts for CPIF inflation were close to 2 per cent at the end of 2012

During 2010 and much of 2011, the Riksbank was assuming that the rapid recovery would continue in 2012. GDP growth was expected to be 2.5 to 3.5 per cent (see Figure 3:6). At the same time, the Riksbank estimated in the forecasts made in 2010 that CPIF inflation would fall and be around 1.5 per cent in 2011. The main reasons for this were that high productivity growth would hold back the domestic cost increase and that the krona appreciation was expected to continue, which would lead to lower import prices (see Figures 3:7 and 3:8). CPIF inflation was then expected to begin to rise apace with the continuing recovery. The Riksbank therefore expected that monetary policy would need to be less expansionary and that the repo rate would need to be raised gradually (see Figure 3:9). CPIF inflation would then be close to 2 per cent at the end of 2012, or the beginning of 2013 (see Figure 3:5). As a result of the planned repo-rate increases, the Riksbank was expecting that CPI inflation would be close to 3 per cent at the end of the forecast period

³⁵ Another contributory factor to the increase in CPI inflation in 2011 was that the banks' margins and costs for financing mortgages increased, which meant that mortgage rates were increased more than was justified by the repo-rate increases. See *Material for assessing monetary policy 2011*, Sveriges Riksbank.
³⁶ See the article "The CPI and other measures of inflation".

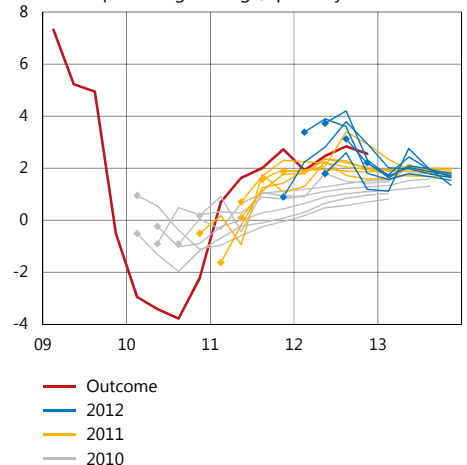
Figure 3:6. GDP growth, outcome and forecasts
Annual percentage change, quarterly data



Note. See the note to Figure 3:4.

Sources: Statistics Sweden and the Riksbank

Figure 3:7. Unit labour cost, outcome and forecasts
Annual percentage change, quarterly data

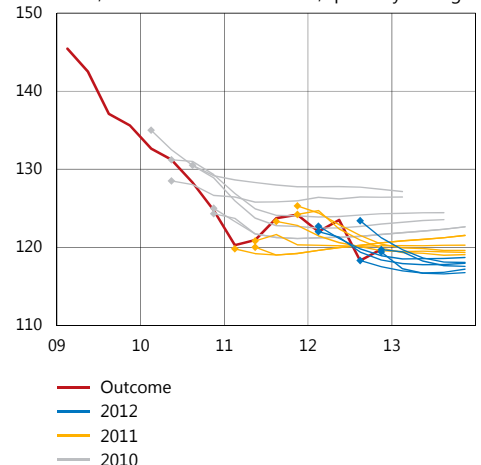


Note. See the note to Figure 3:4.

Sources: Statistics Sweden and the Riksbank

Figure 3:8. TCW-weighted nominal exchange rate, outcome and forecasts

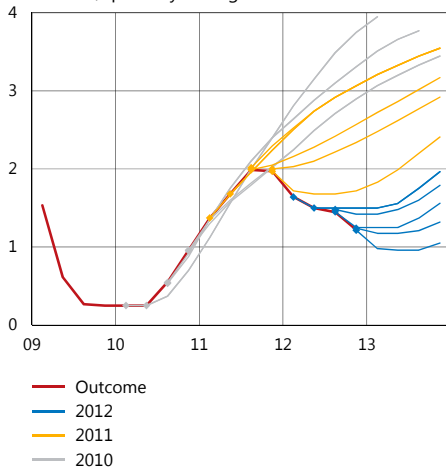
Index, 18 November 1992 = 100, quarterly averages



Note. See the note to Figure 3:4. TCW refers to a weighting of Sweden's most important trading partners.

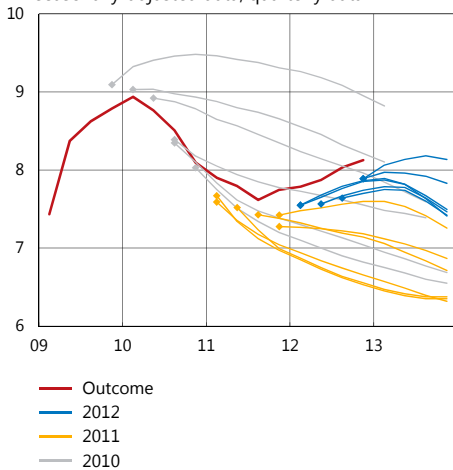
Source: The Riksbank

Figure 3:9. Repo rate, outcome and forecasts
Per cent, quarterly averages



Note. See the note to Figure 3:4.
Source: The Riksbank

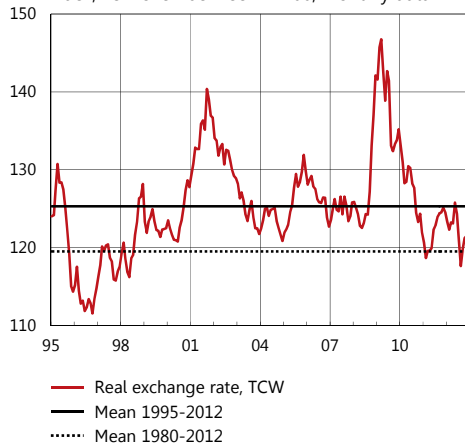
Figure 3:10. Unemployment, outcome and forecasts
Per cent of the labour force, aged 15-74,
seasonally-adjusted data, quarterly data



Note. See the note to Figure 3:4. The labour force surveys (AKU) published in February 2013 revised statistics for the labour market developments during 2010-2012. See footnote 33. The outcomes refer to revised figures.

Sources: Statistics Sweden and the Riksbank

Figure 3:11. TCW-weighted real exchange rate
Index, 18 November 1992 = 100, monthly data



Note. TCW refers to a weighting of Sweden's most important trading partners.

Source: The Riksbank

(see Figure 3:4). When measured as an annual average in 2012, CPIF inflation was expected to be 1.6 per cent and CPI inflation 2.5 per cent.

CPIF inflation did fall, albeit somewhat less than forecast, as energy prices were unexpectedly high at the end of 2010 and beginning of 2011. GDP growth in 2010 and the first half of 2011 was at the same time higher and unemployment lower than the Riksbank had assumed in its forecasts (see Figures 3:6 and 3:10).

It is difficult to forecast exchange rates, but in 2012 the exchange rate was nevertheless roughly at the level anticipated by the Riksbank in its forecasts in earlier years. This also meant that the real krona exchange rate, which is the nominal exchange rate adjusted for relative price levels in Sweden compared with other countries, was at the end of 2012 at a level that can be explained by economic determinants.³⁷ During 2012, the real exchange rate measured in terms of TCW weights was slightly stronger than the average since 1995, but weaker than the average from 1980 (see Figure 3:11).³⁸

■ Concern over bottlenecks, debts and rising inflation expectations

According to forecasts made by the Riksbank in 2010 and early 2011, CPIF inflation would thus reach 2 per cent at the end of the forecast period, while the economy was developing strongly. However, there was considerable uncertainty over what would happen in the Swedish economy during the sharp turnaround that followed on from the deep economic recession in 2009. Several Executive Board members pointed to risks that bottlenecks could arise in the economy and that companies would raise prices more quickly in the stronger economic climate than was compatible with the inflation forecasts in the main scenario.

Prior to making their monetary policy decisions during this period, the Executive Board also discussed the problems that can arise if the repo rate is low for a very long period of time. There were concerns that an even more expansionary monetary policy could entail a risk that household debt would continue to increase rapidly. This was in turn feared to lead to greater problems further ahead, if for instance a fall in housing prices were to make households quickly reduce their debts. The result could be weak developments similar to those affecting several countries in connection with the crisis. During the first half of 2011 there was also concern that the high CPI inflation would become entrenched in the long-term inflation expectations and in wage formation, so that underlying inflation would also rise faster, becoming too high at the end of the forecast period. This was a further reason why the Riksbank would need to continue raising the repo rate.

³⁷ See Lagerwall, Björn and Marianne Nessén, "The long-term development of the krona", *Economic Commentaries* no. 6, 2009, Sveriges Riksbank.

³⁸ Measured in terms of the broader exchange rate index, KIX, the real exchange rate was slightly weaker in 2012 than the average since 1995. See the article "KIX index better reflects Sweden's international dependence" in the *Monetary Policy Report* October 2012 for a description of the differences between TCW and KIX weights.

■ A deeper downturn abroad led to lower inflation

During summer and autumn 2011, there was a significant change in the conditions for growth. The concerns regarding developments in public debt in the United States and several countries in the euro area increased and international growth became weaker than expected. This affected Swedish exports and the Riksbank began to revise down the forecast for GDP growth, particularly for 2012. The planned repo-rate increases were postponed. At the end of 2011 it became increasingly clear that growth in Sweden slowed down relatively severely and the Riksbank cut the repo rate in December. As economic prospects continued to deteriorate during 2012, the Riksbank cut the repo rate further. These repo-rate cuts contributed to the fall in CPI inflation in 2012.

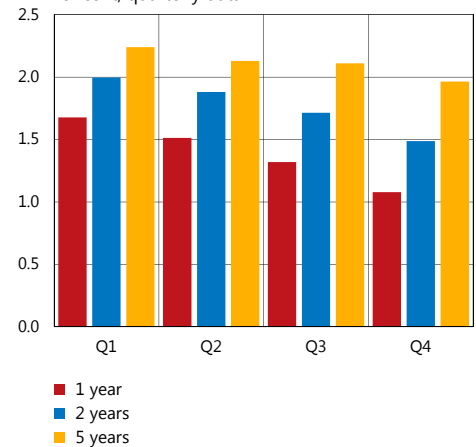
The weak developments abroad and lower domestic demand also contributed to lower inflationary pressures in the Swedish economy and made it more difficult for companies to raise their prices. This picture is supported by the Riksbank's company surveys from 2012, where companies state that prices were subdued by weak demand and stiff price pressure. Model analyses also point to the unexpectedly weak developments abroad and unexpectedly low price mark-ups, particularly during the second half of 2012, having contributed to low inflation.³⁹ The Riksbank had expected that the krona appreciation in 2009-2010 – which followed from the severe weakening in 2008 and early 2009 – would lead to lower import prices with a restraining effect on inflation. But it is difficult to estimate in advance to what extent and how rapidly consumer prices are affected by such extreme fluctuations in the nominal exchange rate and the pass-through effects can vary over time, for instance, depending on the economic situation. The continued fall in goods prices now indicates that the krona appreciation may have subdued inflation over a longer period of time than the Riksbank had anticipated.

During 2010 and the first half of 2011, the Riksbank was expecting that CPIX inflation would on average be 1.6 per cent in 2012 and CPI inflation would be 2.5 per cent. The main explanation as to why inflation became substantially lower in 2012, particularly during the second half of the year, could be said to be the deterioration in the international economy from the second half of 2011. The particularly low outcome for CPI inflation is linked to the fact that the Riksbank cut the repo rate from 2.0 per cent in December 2011 to 1.0 per cent in December 2012.

Inflation expectations 2012

A high level of confidence in the inflation target is important to the Riksbank's efforts to achieve price stability. If the general public is confident that the Riksbank will achieve its target, inflation expectations a few years ahead will be close to the inflation target.

Figure 3:12. Inflation expectations 2012, 1, 2 and 5 years ahead, all participants
Per cent, quarterly data

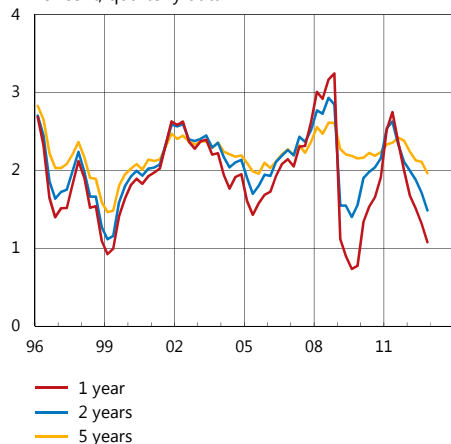


Source: TNS SIFO Prospera

³⁹ In the article "What unforeseen shocks have affected CPIX inflation? A model analysis" the Riksbank's macroeconomic model, Ramses, is used to illustrate the factors behind the unexpectedly low CPIX inflation in 2012.

Figure 3:13. Inflation expectations since 1996, all participants

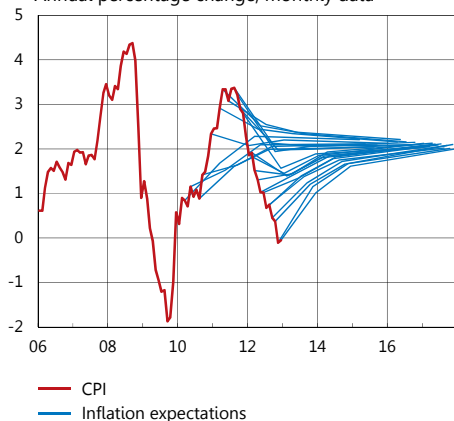
Per cent, quarterly data



Source: TNS SIFO Prospera

Figure 3:14. Inflation expectations among money market participants 2010-2012

Annual percentage change, monthly data

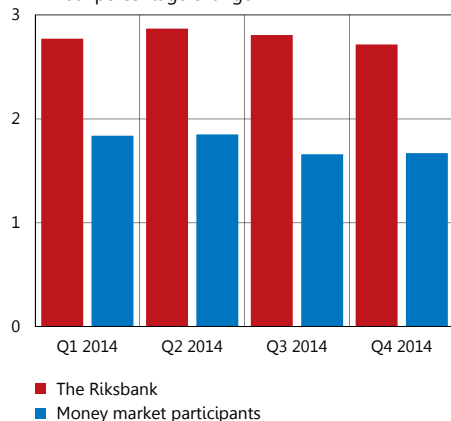


Note. Inflation expectations among money market participants one, two and five years ahead.

Sources: Statistics Sweden and TNS SIFO Prospera

Figure 3:15. The Riksbank's inflation forecasts and inflation expectations (CPI) among money market participants two years ahead, 2012

Annual percentage change



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

Sources: TNS SIFO Prospera and the Riksbank

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 that lead to temporary deviations from the inflation target.

■ Inflation expectations stable around the inflation 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. Average inflation expectations five years ahead among all agents were also close to 2 per cent in 2012, which indicates that the public has confidence in the Riksbank's inflation target (see Figure 3:12).

Inflation expectations one and two years ahead follow the actual inflation rate more closely, for natural reasons.⁴⁰ CPI inflation fell during 2012 and was -0.1 per cent in December, averaging 0.9 per cent over the year. Inflation expectations one year ahead in particular followed CPI inflation closely and fell during the year (see Figure 3:13).

Figure 3:14 shows the average expected CPI inflation among money market participants in 2010-2012.⁴¹ The figure shows that the inflation target has served well as an anchor for inflation expectations. It also shows that when actual inflation is further from the target, such as at the end of 2012, market participants realise that it may take somewhat longer for inflation to return to the target. Figure 3:13 shows that inflation expectations five years ahead have been relatively well-anchored around the inflation target since the late 1990s.

It may also be interesting to compare inflation expectations with the Riksbank's inflation forecasts. If economic agents share the Riksbank's view of how inflation will approach the target, inflation expectations should be relatively close to the Riksbank's forecasts. Figure 3.15 shows the Riksbank's inflation forecasts and inflation expectations among money market participants two years ahead, as they developed during 2012. The figure shows that inflation expectations for 2014 were on average one percentage point lower than the Riksbank's CPI forecasts.

⁴⁰ See Jonsson, Thomas and Pär Österholm, "The Properties of Survey-Based Inflation Expectations in Sweden", *Working Paper* no. 114, National Institute of Economic Research, 2009.

⁴¹ It is particularly interesting to monitor inflation expectations among money market participants as this group can be assumed to devote more resources to forecasting inflation.

■ The development of inflation in a longer perspective

During the period with an inflation target, CPI inflation has, on average, been below target. A large part of this deviation from target can be explained by a decreasing trend in the repo rate. Other conceivable explanations are surprisingly high productivity growth and unexpectedly low prices for imported goods. The Riksbank is conducting an inquiry into the causes and consequences of this low average inflation.

This year, it is 20 years since the Riksbank made the decision to focus monetary policy on achieving an inflation target. The Riksbank announced in January 1993 that an inflation target of two per cent would be introduced from 1995. Inflation would be measured as the change in the consumer price index (CPI) and the target would be surrounded with a tolerance interval of ± 1 percentage point. Over the two years leading up to 1995, monetary policy was to be aimed at preventing the underlying rate of inflation, which had decreased to a level around two per cent, from increasing again.⁴²

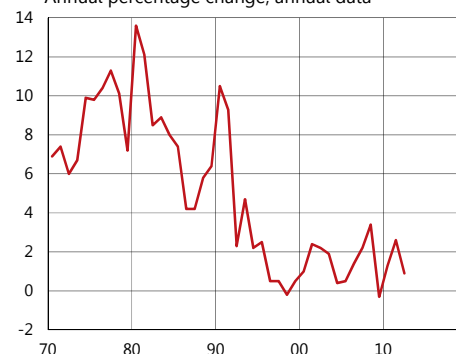
How has inflation developed over the period in which Sweden has had an inflation target? A simple comparison of its development in the 1970s and 1980s shows that Swedish inflation fell dramatically after the inflation target was introduced (see Figure 3:16). Since 1993, CPI-inflation has varied between approximately 0 per cent and just under 4 per cent as an annual change, which can be compared with the 1970s and 1980s when it was not unusual with double-digit inflation figures and a variation between years that was twice as large.

On average, CPI inflation has been below target

To analyse the development of Swedish inflation more accurately during the period of inflation targeting, it is first necessary to determine which period to study. Starting in 1993 may seem self-evident, as this was the year in which the inflation target was announced. However, the target of a two per cent annual increase of the CPI was not applied until 1995, which suggests that the calculation should instead start with that year.⁴³ If, on the other hand, it is preferred to keep to a period in which inflation expectations had fallen and become anchored at the inflation target, 1997 may be a more appropriate starting point. However, regardless of whether the period 1995-2012 or the period 1997-2012 is studied, average CPI inflation is the same, 1.3 per cent.

However, the analysis is complicated by this average being based on inflation calculated by Statistics Sweden according to a method introduced in 2005. This has some significance in the evaluation of monetary policy as, before 2005, the Riksbank used a measure of CPI inflation- calculated by Statistics Sweden using another method. If inflation outcomes prior to 2005 are replaced by outcomes calculated according to this earlier method, thereby creating a 'real time series' for

Figure 3:16. CPI since 1970
Annual percentage change, annual data

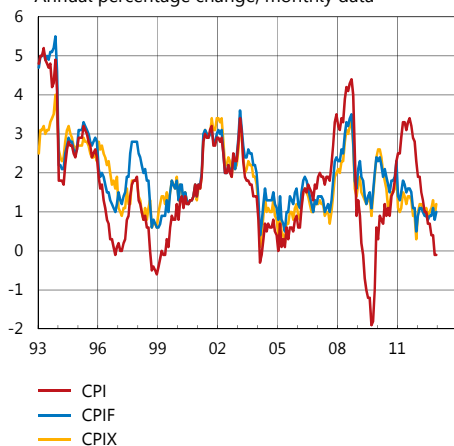


Source: Statistics Sweden

⁴² Calculations of underlying inflation are aimed at eliminating large and temporary changes in the prices of individual goods and services that may have transitory but serious effects on CPI inflation.

⁴³ See, for example, Andersson, Björn, Stefan Palmqvist, and Pär Österholm, "The Riksbank's attainment of its inflation target over a longer period of time". *Economic Commentaries* no. 4, 2012, Sveriges Riksbank.

Figure 3:17. CPI, CPIF and CPIX in real time
Annual percentage change, monthly data



Note. Monthly inflation outcomes from January 1993 to December 2012. Inflation outcomes for the period before 2005 are calculated in accordance with the method used in real time during this period.

Sources: Statistics Sweden and the Riksbank

CPI inflation, the average CPI inflation becomes a tenth of a percentage point higher, that is 1.4 per cent, over the periods 1995–2012 and 1997–2012.⁴⁴

Table 3:3 at the end of the article compiles these results and also reports the average for three sub-periods. The table shows that the development of CPI inflation has differed somewhat over the sub-periods. During the second half of the 1990s, as in the period subsequent to the outbreak of the financial crisis in 2008, CPI inflation in real time was 1.1 per cent, on average. From the 2000s until the financial crisis, average CPI inflation was 1.8 per cent, that is significantly closer to the inflation target.

Inflation in terms of the CPIX and the CPIF has been closer to 2 per cent on average

Over the years, the Riksbank has emphasised that, even if the inflation target is formulated in terms of the CPI, the Riksbank should not react to all changes in this measure as the CPI is often affected by factors that are only deemed to have temporary effects on inflation.⁴⁵ There is thus reason to analyse inflation measures that are adjusted for such temporary effects. One example of such an inflation measure is the CPIX (previously called the UND1X). It was phased out in 2008, when the CPIF was introduced.⁴⁶ The common factor for these two measures is that they disregard the direct effects of changes in the repo rate on the CPI. Figure 3:17 shows how inflation according to the CPI, the CPIX and the CPIF developed in the period with an inflation target, according to a real-time analysis.

As the Riksbank, in various periods, has most often used either CPIX or CPIF inflation to explain the monetary policy being conducted, it is also interesting to see what these measures have been, on average, during the period with an inflation target.⁴⁷ Table 3:3 therefore shows the average inflation for the CPIX and the CPIF with the same division into periods as for the CPI. The table shows that the CPIX in real time has averaged 1.7 or 1.6 per cent, depending on whether the period starts in 1995 or 1997. CPIF inflation has been a tenth of a percentage point higher, which is to say 1.8 or 1.7 per cent respectively.

⁴⁴ A description of the change of calculation method can be found in the article "Changes in the methods for calculating the inflation rate" in *Inflation Report 2004:2*.

⁴⁵ See the article "The CPI and other measures of inflation".

⁴⁶ For more information on the differences between the CPIX and the CPIF and the reasons for the phasing-out of the CPIX, see Wickman-Parak, Barbro, "The Riksbank's inflation target", speech at Swedbank, Stockholm, 9 June 2008. See also the articles "How are measures of underlying inflation used in monetary policy analysis?" and "The rate of increase in the CPIX will be below the CPI for a long time", both in *Inflation Report 2008:2*.

⁴⁷ However, CPIX and CPIF inflation are not the only measures used in this way. For example, in 2002–2003, monetary policy was guided by the CPIX excluding prices for energy-related products. Furthermore, in addition to variations in the usage of different measures, it is only in certain periods that a specific measure, apart from the CPI, has specifically been cited as a justification for the monetary policy being conducted. It is thus difficult to determine exactly when various measures have been used in this manner.

CPI inflation has deviated from target because the repo rate has fallen

Regardless of whether the time period being analysed starts in 1995 or 1997, CPI inflation, according to data in real time, averaged 1.4 per cent until the end of 2012 and was thus 0.6 percentage points below the inflation target. Why has inflation been so low? Part of the explanation becomes clear if average CPI inflation is compared with average CPIF inflation. The only factor separating these measures is that the mortgage rate is assumed to be fixed in calculations of the CPIF, which means that the CPIF is not directly affected by changes in the interest rate level in the same way that the CPI is. As Table 3:3 shows, CPIF inflation has averaged 1.8 (1.7) per cent since 1995 (1997). In other words, a large part of the target deviation (0.3–0.4 percentage points) is due to CPI inflation having become lower due to falling interest rates.

The fall in interest rates partly reflects a trend decrease in the general level of interest rates. However, as the data in the table indicates, there have been two periods in which interest rates have fallen particularly much and in which average CPI and CPIF inflation have differed widely. One period covers the second half of the 1990s, when the interest rate level was initially high but then fell substantially in 1996. In this year, the Riksbank cut the repo rate by 4.8 percentage points and market rates fell to a corresponding degree. Such a dramatic interest rate cut pushes CPI inflation down for a long period.⁴⁸ The other period was in conjunction with the financial crisis 2008–2009, when the Riksbank also cut the repo rate substantially, from 4.75 per cent to 0.25 per cent within the space of ten months.

An inquiry into the causes and consequences of this low average inflation is underway

Falling interest rates can thus explain more than half of the average deviation from target of CPI inflation, but they cannot explain the entire deviation. What other reasons are there?

Two explanations often put forward, above all in the first decade of this century, are that cost pressures in the economy are being restrained by the surprisingly strong development of output and that, in addition, inflation is being pushed down by low prices for imported goods. However, these two factors are not the only explanations being put forth. Two decades is a long period and, over these years, the economy has been impacted by several different disruptions that have affected inflation and that the Riksbank has had to analyse and address. Why inflation has been lower than the target, what the real economic costs of this have been and, more generally, what conclusions one can draw about the impact of monetary policy on inflation and unemployment over the last 20 years, are questions that are currently under discussion and on which opinion is divided. One view is that inflation falling below the inflation target has had relatively significant effects on unemployment, while others believe that the effects have been more

⁴⁸ How long the effect remains depends on what happens to the fixed mortgage rates. If all such interest rates fall, the initial interest rate cut contributes towards pushing CPI inflation down for another eight years (with the current CPI method – five years with the method used in 1996).

limited and that calculations that attempt to estimate the effects are generally associated with a high degree of uncertainty.⁴⁹

The link between monetary policy, inflation and unemployment was also discussed in February at a workshop organised by the Riksbank at which external researchers presented papers on this theme and discussed their results. Most of the papers addressed the high rate of unemployment that can now be observed in many countries from a variety of angles. The papers focused on various causes of unemployment and drew different conclusions about the role that monetary policy could play to counteract it.⁵⁰

Table 3:3. Mean value of inflation in various periods according to different measures of inflation

Per cent

	CPI	CPI, real time	CPIX	CPIX, real time	CPIF	CPIF, real time
1993-2012	1.5	1.7	1.7	1.8	1.9	2.0
1995-2012	1.3	1.4	1.5	1.7	1.7	1.8
1997-2012	1.3	1.4	1.5	1.6	1.6	1.7
1995-1999	0.8	1.1	1.5	1.7	1.6	1.9
2000-2008	1.7	1.8	1.6	1.7	1.8	1.9
2009-2012	1.1	1.1	1.4	1.4	1.5	1.5

Note. The mean values of monthly inflation outcomes. "Real time" indicates that inflation outcomes before January 2005 have been calculated according to an older method. The CPIF was introduced in June 2008, so the real-time analysis for the CPIF therefore shows how the CPIF should have developed had the measure been available before that date.

Sources: Statistics Sweden and the Riksbank

⁴⁹ See Svensson, Lars E. O., "The Possible Unemployment Cost of Average Inflation below a Credible Target", *Working Paper*, 2012, available on www.larseosvensson.net, and Söderström, Ulf and Anders Vredin, "Inflation, unemployment and monetary policy", *Economic Commentaries* No. 1, 2013, Sveriges Riksbank.

⁵⁰ A report from the workshop will be published in an issue of Sveriges Riksbank Economic Review in the autumn of 2013, in which it is also planned to include an article with the results of the Riksbank's own inquiry.

■ What unforeseen shocks have affected CPIF inflation? A model analysis

The Riksbank's macroeconomic model Ramses can be used to analyse differences between outcomes and forecasts. According to the model, the lower-than-forecast CPIF inflation in 2012 was due to unexpectedly weak development abroad, surprisingly low cost pressures and to companies reducing their margins more than expected.

CPI inflation in 2012 was 1 percentage point lower than the average of the forecasts that the Riksbank published in 2010–2012. Measured in terms of the CPIF, inflation over the year was 0.4 percentage points lower. Chapter 3 describes in detail how the Riksbank's forecasts for CPIF inflation changed during these years. In July 2011, the Riksbank expected CPIF inflation to be around 1.5 per cent at the start of 2012 and to be close to 2 per cent at the end of the year. Instead, CPIF inflation varied around 1 per cent throughout the whole of 2012 (see Figure 3:18).

One tool that can be used to understand what such differences between outcomes and forecasts are due to is the macroeconomic model of the Swedish economy, Ramses, which is used in the work on producing material on which the Riksbank's forecasts and monetary policy decisions are based.⁵¹ The model tries to explain developments and interactions in the economy as a whole and not only in a part of it. This article analyses the differences between the outcomes for CPIF inflation and the Riksbank's forecasts with the aid of the model.

The black line in Figure 3:19 shows the difference between the outcomes and the forecasts, the forecasting errors, for each quarter in the assessment of CPIF inflation made by the Riksbank in July 2011. For example, the Riksbank assessed that CPIF inflation would be 1.9 per cent during the third quarter of 2012. In actual fact, it was 0.9 per cent. The difference between outcome and forecast was thus 1 percentage point.⁵²

The model interprets changes in CPIF inflation on the basis of around twenty different shocks. In Figure 3:19, these shocks have been grouped to provide an overall explanation for the differences between outcomes and forecast that arose during the different quarters in 2012.

Weaker economic activity abroad, low price increases and low domestic cost pressures resulted in lower than expected inflation

During the whole of 2012, an unexpectedly low domestic cost pressure contributed to holding back the rate of price increase (red area). The effect was greatest at the start of the year.

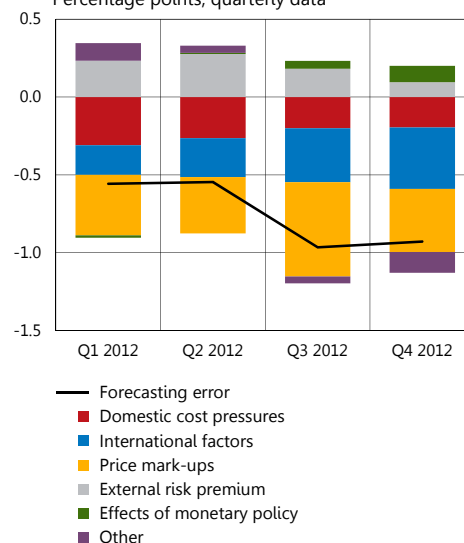
Another important factor behind the low inflation rate in 2012 is economic developments abroad (blue area). Throughout the entire year, unexpectedly weak developments abroad contributed towards CPIF inflation being lower than the Riksbank had forecast in July 2011. As was

Figure 3:18. CPIF, outcome and forecast in July 2011
Annual percentage change, monthly data



Note. The CPIF is the CPI with a fixed mortgage rate.
Sources: Statistics Sweden and the Riksbank

Figure 3:19. CPIF inflation 2012: forecasting error and effects of unforeseen shocks
Percentage points, quarterly data



Note. The forecasting error refers to deviation between outcome and forecast in July 2011, annual percentage change.
Source: The Riksbank

⁵¹ For a description of the model, see Adolfson Malin, Stefan Laséen, Lawrence Christiano, Mathias Trabandt and Karl Walentin, "Ramses II – Model Description", Occasional Paper no. 12, 2013, Sveriges Riksbank.

⁵² For a number of variables, for example National Accounts data, the outcomes for the fourth quarter 2012 were unavailable when this analysis was made. For these variables, the Riksbank's assessment of the current situation from the *Monetary Policy Report* published in February 2013 has been used.

noted in Chapter 2, the negative effects on the Swedish economy of the weak developments abroad turned out to be greater in the second half of 2012 than the Riksbank had previously expected. Such an effect can also be seen in Figure 3:19, which shows how the unexpectedly weak developments abroad contributed towards pushing inflation down most strongly in the last two quarters of the year.

A third factor that the model indicates played a significant role for the low inflation in 2012 is companies' price mark-ups (yellow area).⁵³ According to this analysis, the companies lowered their margins to an unexpected extent in 2012, which also contributed towards inflation becoming low. This effect was also greatest in the second half of the year.

The model cannot explain why companies' price mark-ups were unexpectedly low. But one possible explanation is that the weak developments abroad and the low domestic demand made it more difficult for companies to raise their prices. Support for this interpretation can be found in the Riksbank's polls of a selection of Swedish companies.⁵⁴ In September 2012, it was observed that companies' price expectations had changed significantly. According to the companies, prices were under pressure due to weak demand and the fact that there was spare capacity in many segments. The report published at the start of 2013 noted that many companies mentioned severe price pressure, and some references were made to a price war.⁵⁵ A further explanation of the low price increases could be that previous appreciations of the krona had dampened inflation more permanently than the model assumed.

The Swedish krona became unexpectedly weak in parts of 2011 and 2012, which restrained the fall in inflation

While weak developments abroad, low price mark-ups and low domestic cost pressures dampened inflation in 2012, other factors contributed towards holding up inflation. Among these factors, in the second half of 2011 and the first half of 2012, the krona became weaker than the Riksbank had expected in July 2011. A weaker krona normally leads to imported goods becoming more expensive in Swedish krona and to higher demand for Swedish goods and services. This tends to increase inflation, both directly through higher import prices and through higher resource utilisation leading to increased cost pressures. According to the model, the depreciation of the krona was largely due to the increase of risk premiums on investments in Swedish krona. Figure 3:19 shows the effects of the risk premium on inflation as a grey area.

⁵³ The model identifies price increases on both domestic production (for domestic use or export) and on imported goods (consumer and investment goods). The effects of all of these price increases are included in the yellow area.

⁵⁴ The companies interviewed in the survey are mainly large companies and international groups, but the focus is on the Swedish part of their operations.

⁵⁵ These reports can be downloaded in PDF format from the Riksbank's website, www.riksbank.se/en, under the heading Press & Published/Reports/The Riksbank's Company Survey.

Unexpected disruptions and monetary policy deliberations

The repo rate was significantly lower in 2012 than the Riksbank had expected in July 2011. Ramses interprets this low repo rate largely as a normal reaction by the Riksbank to the poorer economic developments, according to historical behaviour patterns. If anything, the repo rate was cut a little more than normal, which held up inflation in the second half of 2012. This is evident from the contribution made by the monetary policy shocks (green area) in Figure 3:19.

It is important to point out that Figure 3:19 shows contributions to the forecast error for inflation from various shocks that were unexpected in July 2011 and which only affected the Swedish economy afterwards. This means that, to a large extent, monetary policy in 2012 could not predict and counteract these shocks.

CHAPTER 4 – Forecasting performance

Monetary policy acts with a lag and must therefore be forward-looking and based on forecasts. There is often a large degree of concordance in the forecasts made by different analysts. During the first half of 2011, most analysts had a positive view of economic activity in 2012, which was subsequently revised in a more negative direction. In a comparison over a longer period of time, the differences in forecasting performance are small and overall not statistically significant.

Forecasts for 2012

Forecasts are rarely completely accurate. Figures 4:1-4:5 show how the forecasts made by the Riksbank and other analysts for 2012 regarding a number of central variables change over time. The typical pattern is that the forecasts made at an early stage, in the beginning of 2011, are relatively far from the final outcome. As time passes, the forecasts become gradually more accurate.

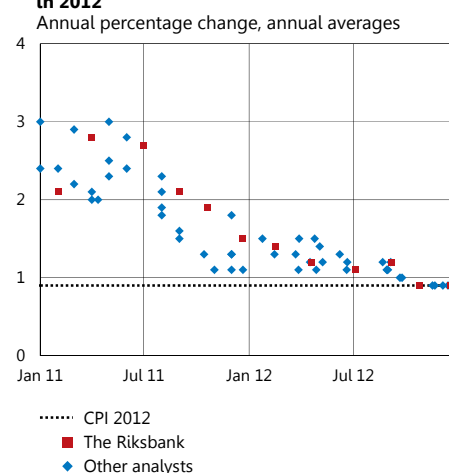
Another typical pattern is that analysts' forecasts develop in a similar manner and tend to be relatively close to one another. There is some spread, primarily in the earlier forecasts, but it is rare that any forecaster succeeds in predicting the final outcome much earlier than others. This is a good illustration of the fact that the economy is constantly hit by shocks that are difficult or impossible to predict and which mean that even well-founded forecasts must be revised along the way.⁵⁶

■ Positive view of economic activity in 2011

Figure 4:1 shows that all analysts were expecting at the beginning of 2011 that CPI inflation would be between 2 and 3 per cent in 2012, which can be compared with the final outcome of 0.9 per cent. CPIF inflation was overestimated to a somewhat lesser degree (see Figure 4:2).

The overestimation of inflation reflects the relatively positive view of economic developments in 2012, which Swedish economic analysts had during the first half of 2011. Accordingly, GDP growth and the repo rate were also overestimated, while unemployment was underestimated (see Figures 4:3, 4:4 and 4:5).⁵⁷ The forecasts for inflation, GDP growth and the repo rate were gradually adjusted down during the second half of 2011, while the forecast for unemployment was adjusted up, as new information indicating weaker developments began to come in. It is worth noting that many analysts actually also underestimated GDP growth and overestimated unemployment, particularly during the first half of 2012.⁵⁸

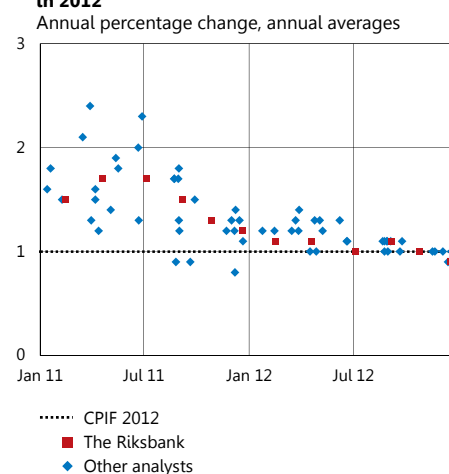
Figure 4:1. Forecasts 2011-2012 for CPI inflation in 2012



Note. Other analysts refers to the Swedish Ministry of Finance, the National Institute of Economic Research, the Swedish Trade Union Confederation (LO), Nordea, SEB, Svenska Handelsbanken, the Confederation of Swedish Enterprise and Swedbank.

Sources: Respective analysts, Statistics Sweden and the Riksbank

Figure 4:2. Forecasts 2011-2012 for CPIF inflation in 2012



Note. Other analysts refers to those specified in Figure 4:1. The CPIF is the CPI with a fixed mortgage rate.

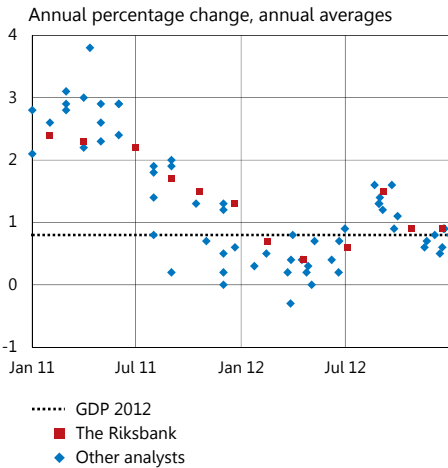
Sources: Respective analysts, Statistics Sweden and the Riksbank

⁵⁶ See the article "On assessing monetary policy".

⁵⁷ The forecasts for the repo rate refer to the end of the year. The Riksbank's quarterly forecasts have been interpolated to daily values to produce a value at the end of the year.

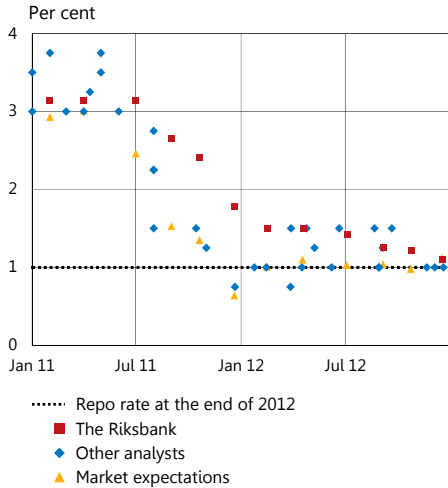
⁵⁸ The comparison refers to unemployment before the revision of the labour force surveys (AKU) in February 2013, see footnote 33.

Figure 4.3. Forecasts 2011-2012 for GDP growth in 2012



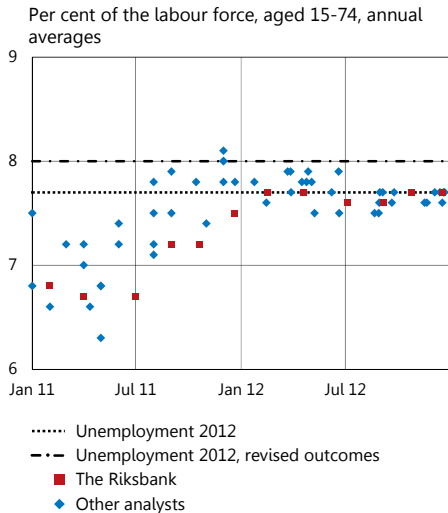
Note. Other analysts refers to those specified in Figure 4.1 and the Swedish Retail Institute.
Sources: Respective analysts, Statistics Sweden and the Riksbank

Figure 4.4. Forecasts 2011-2012 for the repo rate at the end of 2012



Note. Other analysts refers to the Swedish Ministry of Finance, the National Institute of Economic Research, Nordea, SEB and Swedbank. Market expectations are calculated on the basis of market pricing. See footnote 57 for information on the Riksbank's forecasts for the repo rate.
Sources: Respective analysts and the Riksbank

Figure 4.5. Forecasts 2011-2012 for unemployment in 2012



Note. Other analysts refers to those specified in Figure 4.1. See Figure 3:10 for information on revised outcomes for unemployment.
Sources: Respective analysts, Statistics Sweden and the Riksbank

Measure of forecast accuracy

Although the similarities between different analysts' forecasts are more striking than the differences, there is nevertheless some dispersion among the forecasts. One means of comparing the accuracy of different analysts' forecasts is to calculate the mean error, that is, to calculate how much the forecasts have on average deviated from the outcome. In Figure 4:3, for instance, the Riksbank's mean error for GDP growth could be estimated by calculating, for each time a forecast is made, the difference between the final outcome and the red dot and then taking the mean value of these differences. A negative mean error indicates that the forecast was on average above the final outcome, while a positive mean error means that the forecast was on average too low.

One weakness with this method is that forecasting errors with different signs offset one another. Large forecasting errors that go in different directions – overestimates on some occasions and underestimates on others – may thus give a small mean error and incorrectly give the impression that the forecasts are accurate. It is therefore common to also calculate the average *squared* forecasting error (mean squared error). This means that the forecasting error for each point in time is squared before the mean is computed. This eliminates the problem of positive and negatives forecasting errors offsetting one another.

The accuracy of the forecasts for the period 1999-2012

Statistical measures of accuracy, such as mean errors and mean squared errors, have limited information value when calculated for individual years. If a forecaster succeeds particularly well in an individual year, it may be largely due to chance. Next year the same forecaster may do less well. The calculations of mean errors and mean squared errors for 2012 for a number of analysts are nevertheless shown in the Appendix.

It is better to study a longer period of time to get a more stable picture of forecast accuracy. Figures 4:6-4:10 show mean errors and mean squared errors for CPI inflation, CPIF inflation, GDP growth, unemployment and the repo rate calculated over a longer period of time. The period studied for CPI inflation, GDP growth and unemployment is 1999-2012. The periods studied for CPIF inflation and the repo rate are shorter, 2008-2012 and 2007-2012 respectively. The reason these periods are shorter is because the CPIF measures was introduced in 2008 and the Riksbank began to publish repo-rate forecasts in 2007.⁵⁹

The forecasting errors have been calculated in the way described above, that is, they have been based on all of the analysts' forecasts for a particular variable in a particular year. The mean squared errors have been adjusted using a method that takes into account the fact that some

⁵⁹ The CPIF was introduced in the Monetary Policy Report in July 2008. With regard to the Riksbank, the forecasting errors during the first half of 2008 refer to CPIX inflation. The forecasts by other analysts at the beginning of the period may also refer to CPIX. These two measures have in common that they disregard the direct effects of changes in the repo rate on the CPI. See the article "The development of inflation in a longer perspective".

forecasters on average produce their forecasts later than others and therefore have access to more information when they do so.⁶⁰ It may be worth noting that the Riksbank's forecasts up to the end of 2005 were based on the assumption of an unchanged repo rate during the forecasting period. This assumption was of course not very realistic and may have contributed to the Riksbank's forecasts being less accurate.

A corresponding comparison of mean errors and adjusted mean squared errors was made in the report Material for assessing monetary policy 2011. This comparison differ relatively little from the analysis presented here, as information for only one further year has been added.

■ Relatively small differences in forecast accuracy

The Riksbank appears to have made relatively good forecasts for CPIIF inflation, GDP growth and unemployment. However, the accuracy is relatively lower for CPI inflation. As the development of the repo rate plays a central role in the difference between the CPI and the CPIIF, the lower precision of the CPI inflation forecast should be reflected in a lower relative accuracy for the repo rate as well.⁶¹ This appears to be confirmed by Figure 4:10, although it should be noted that the repo rate has been studied for a shorter period of time than CPI inflation. The fact that the blue columns are negative means that all analysts have on average overestimated the repo rate, but the Riksbank has the largest adjusted mean squared error.

It should be emphasised that the assessment period for both CPIIF inflation and the repo rate is so far relatively short and that chance therefore plays a larger role in the results. Moreover, relatively few other analysts have made forecasts for the repo rate since 2007.

One of the changes in relation to the corresponding analysis last year is that the accuracy of the market expectations of the repo rate, as estimated on the basis of market pricing, has improved quite substantially. As shown in Figure A15 in the Appendix and in part in Figure 4:4, the adjusted mean error for 2012 is much smaller for market expectations than for traditional forecasters. As the assessment period for the repo rate is still short, the results for an individual year have a relatively large impact on the average.⁶²

It is worth emphasising that even if there are some differences in accuracy among different analysts also when investigating a longer period of time, these differences are in general relatively small. Formal tests show that the differences are usually not statistically significant.⁶³

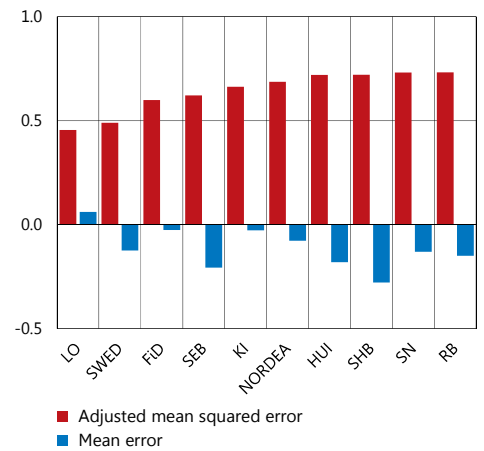
⁶⁰ For a description of the method, see Andersson, Michael and Ted Aranki, "Forecasters' performance – what do we usually assess and what would we like to assess?" *Sveriges Riksbank Economic Review*, 2009:3, Sveriges Riksbank.

⁶¹ Developments in mortgage rates, which are what distinguish the CPI from the CPIIF, are also affected by the banks' costs of funding mortgages and by the banks' margins on mortgages. See the article "The relationship between the repo rate and interest rates for households and companies" in the *Monetary Policy Report*, February 2012.

⁶² An interesting result in Beechey, Meredith and Pär Österholm, "Policy Interest-Rate Expectations in Sweden: A Forecast Evaluation", *Working Paper* No. 127, National Institute of Economic Research, 2012, is that the forecasting precision with regard to the repo rate of market expectations and surveys has improved since the Riksbank began publishing its forecast for the repo rate.

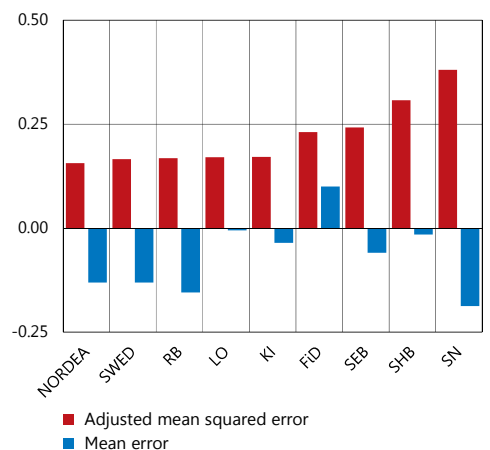
⁶³ See Tables A1 and A2 in the Appendix for an account of the test results. The hypothesis that all analysts are equally good at making forecasts cannot be rejected at the 5-per cent level, which is the level normally used. However, at the weaker 10-per cent level one can reject the hypothesis that all analysts are equally good at making forecasts of unemployment. Pairwise testing between the Riksbank and other analysts show two differences that are statistically reliable at the 5-per cent level. SEB makes significantly better forecasts of unemployment and SN significantly poorer forecasts of CPIIF inflation.

Figure 4:6. Accuracy of the forecasts of various forecasters for CPI inflation 1999-2012



Note. FID = Swedish Ministry of Finance, KI = National Institute of Economic Research, LO = Swedish Trade Union Confederation, RB = the Riksbank, SHB = Svenska Handelsbanken, SN = Confederation of Swedish Enterprise and SWED = Swedbank. Sources: Respective analysts and the Riksbank

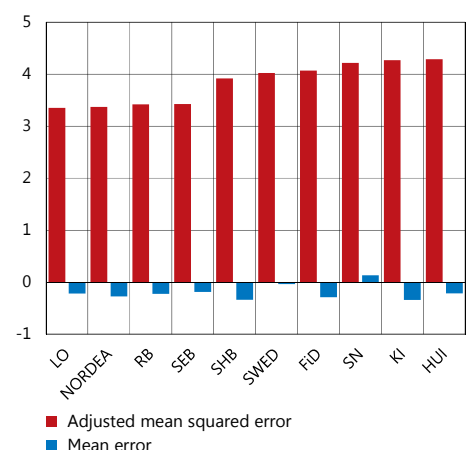
Figure 4:7. Accuracy of the forecasts of various forecasters for CPIIF inflation 2008-2012



Note. See Figure 4:6 for an explanation of the abbreviations. See footnote 59 for information on the data on which the Figure is based.

Sources: Respective analysts and the Riksbank

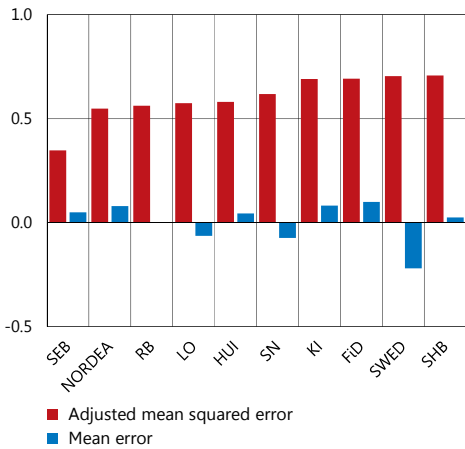
Figure 4:8. Accuracy of the forecasts of various forecasters for GDP growth 1999-2012



Note. See Figure 4:6 for an explanation of the abbreviations.

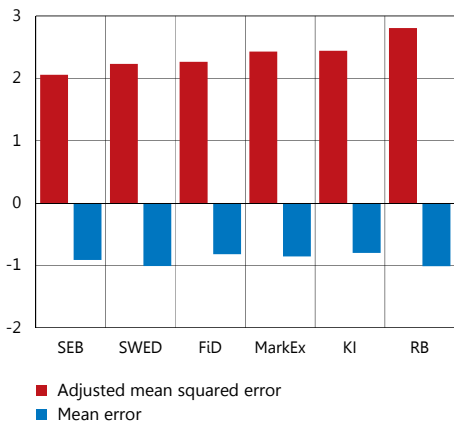
Sources: Respective analysts and the Riksbank

Figure 4:9. Accuracy of the forecasts of various forecasters for unemployment 1999-2012



Note. See Figure 4:6 for an explanation of the abbreviations.
Sources: Respective analysts and the Riksbank

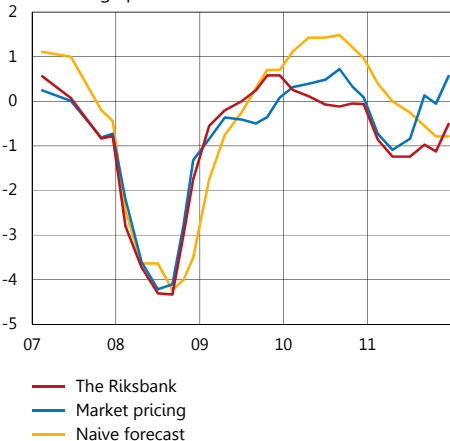
Figure 4:10. Accuracy of the forecasts of various forecasters for the year-end repo rate 2007-2012



Note. See Figure 4:6 for an explanation of the abbreviations.
MarkEx = Market expectations calculated on the basis of market pricing. Forward rates are adjusted for average risk premiums corresponding to one basis point per month of the maturity period. Prior to 2007, the Riksbank did not publish forecasts for the repo rate. The Riksbank's quarterly forecasts have been interpolated to daily values to produce a value at the end of the year.

Sources: Respective analysts and the Riksbank

Figure 4:11. Forecasting errors, one year
Percentage points



Note. The date refers to when the forecast were made.
Source: Beechey and Österholm, see footnote 64

■ **Study of policy rate forecasts at different time horizons**

The accuracy with regard to the repo rate has also been examined in a study at the National Institute of Economic Research.⁶⁴ The study compares the forecasting precision at different time horizons for the Riksbank and for repo-rate expectations that can be inferred from market pricing. In addition to the Riksbank, Norges Bank is also included in the study. These two central banks are the only ones that publish forecasts for their policy rates.⁶⁵

Figure 4:11 shows forecasting errors for the Riksbank and the market since 2007, one year ahead. The figure also shows forecasting errors for a so-called naive forecast, which assumes that the repo rate will not change, but will remain the same as at the time of the forecast. The study also analyses the forecasting errors in the forecasts one quarter ahead and also two years ahead.

The conclusion is drawn in the study that there are relatively small differences in forecasting precision between the central bank and market-based measures in both Norway and Sweden.⁶⁶ Compared with a naive forecast, Norges Bank's forecasts are better at all horizons and the Riksbank's at one quarter ahead and one year ahead.

However, the average forecasting error does not equal zero at longer time horizons for either the two central banks or market expectations in the respective countries. There is thus a so-called bias in the forecasts. Both the central banks themselves and the market have forecast that the policy rate would be higher than was actually the case. However, this overestimation is to a large extent due to the period being short and containing the financial crisis, when the central banks had to cut their policy rates substantially and quickly.

⁶⁴ Beechey, Meredith and Pär Österholm, "Central Bank Forecasts of Policy Interest Rates: An Evaluation of the First Years", *Working Paper* No. 128, National Institute of Economic Research, 2012.
⁶⁵ The Reserve Bank of New Zealand has published a forecast for a 90-day rate since 1998, but not a forecast for its policy rate. In January 2012, the US central bank, the Federal Reserve, began to publish policy rate forecasts by the individual members of the Federal Open Market Committee, its equivalent to the Executive Board of the Riksbank.
⁶⁶ In Sweden, market expectations one year ahead are significantly more accurate than the Riksbank's forecast at the 10-per cent level, which is usually regarded as a weak significance level.

■ The Riksbank's development work 2012-2013⁶⁷

The Riksbank conducts ongoing development work so that monetary policy decisions are based on the best possible basis. This year, this has included a more detailed analysis of the workings of the labour market, continued work on strengthening the financial analysis in forecast and model work, and the development of a method for quantifying and illustrating measurement uncertainty in monetary policy expectations.

More detailed analysis of the workings of the labour market

The Riksbank continually monitors the development of economic policy and, in recent years, has paid special attention to the changes that have affected incentives on the labour market. Among other initiatives, the Riksbank has increased the depth of its analysis of how the labour market works in both shorter and longer terms.

The Riksbank's analysis of current resource utilisation was complemented in 2012 with more indicators to be used as support in the analysis of the labour market. These include, for example, statistics on unemployment and recruitment times, and on the composition of unemployed and other groups in and outside the labour market. Alongside this, an indicator model was also developed to illustrate matching efficiency. The results of this work indicate that matching between jobseekers and job vacancies has deteriorated in recent years, meaning that it may take longer than normal to reduce unemployment.⁶⁸

In addition, the Riksbank carried out a review of its assessment of the long-term development of the Swedish labour market. The review was aimed at analysing two factors of importance to this assessment – demographic developments and the effects of the government's reform programme which, since 2006, has been particularly focused on increasing incentives for work. The analysis showed that uncertainty over the level of long-term sustainable unemployment is considerable. It is particularly uncertain how long-run unemployment is affected by new groups with a weaker position in the labour market entering the labour force. The Riksbank deemed that long-run sustainable unemployment would lie in the interval 5-7.5 per cent in the period ahead.⁶⁹

Strengthening the financial analysis in forecast work

The work of strengthening the financial analysis in the Riksbank's forecast and model work continued in 2012. Above all, the Riksbank focused on clarifying and emphasising the links between monetary policy and the actual financial conditions faced by households and companies. Among other work, the Riksbank gathered data and developed forecasting routines to allow it to survey how financial circumstances

⁶⁷ See also the article "The development of inflation in a longer perspective" for an account of the Riksbank's analysis of long-term target fulfilment.

⁶⁸ The results were presented in the article "Has the functioning of the labour markets changed?" in the *Monetary Policy Report* published in October 2012.

⁶⁹ The results of this analysis were presented in the article "Long-run developments in the Swedish labour market" in the *Monetary Policy Report* published in July 2012.

affect household assets and liabilities. This survey has also contributed towards the development of the analysis of financial stability.

Furthermore, the Riksbank developed new routines for calculating households' (and companies') actual interest expenditure, which, together with the new data, contributed towards allowing the Riksbank to improve its methods for the calculation of household incomes. The Riksbank also developed its calculations of how the repo rate affects market rates and, ultimately, the actual interest rates applied to banking customers. These changes have made the connection between the repo rate and households' actual capital income and capital expenditure clearer in the forecasts.⁷⁰

Strengthening the financial analysis of the Riksbank's forecasting work is an important area of development work that will continue in 2013.

Development of methods for measuring monetary policy expectations

Expectations of future monetary policy are important as they affect the long-term rates that households and companies have to pay. By monitoring the development of monetary policy expectations, the Riksbank can achieve a better understanding of how repo-rate decisions and communication affect these rates.

Monetary policy expectations are not directly observable, but must be measured. This can be done in two main ways: through surveys or on the basis of the market pricing of forward rates. However, both surveys and forward rates are associated with problems that may give rise to measurement errors. For surveys, a lack of incentives among respondents and imbalances in the sample can mean that responses do not capture the true overall expectations sufficiently well. Forward rates, on the other hand, do not only reflect monetary policy expectations but also risk premiums. These risk premiums must be excluded to obtain a fair measure of the monetary policy expected by the market participants. Risk premiums, which can be positive or negative and vary over time, are difficult to estimate.

The Riksbank has developed a method for quantifying and illustrating the measurement uncertainty of the monetary policy expectations through an uncertainty interval.⁷¹ The Riksbank expects to be able to continue to develop and improve the calculation of the uncertainty interval, as well as more general estimations of monetary policy expectations, at the same rate as measurement methods continue to be refined.

⁷⁰ See also the article "The household balance sheet and the macroeconomic assessment" in the *Monetary Policy Report* published in February 2013.

⁷¹ See the article "Perspectives on monetary policy expectations and forward rates" in the *Monetary Policy Report* published in February 2013.

CHAPTER 5 – Predictability and monetary policy expectations

In general, the repo-rate decisions in 2012 appear to have been slightly less difficult to predict than the decisions in 2010-2011. With regard to expectations of the future repo rate, surveys and estimates based on forward rates indicated that in 2012 market participants were expecting a lower future repo rate than the Riksbank had forecast, both one and two years ahead. One explanation for the differences could be that the market had a more negative view of future economic developments, but the difficulties in correctly measuring actual market expectations of future monetary policy could also be a factor.

Were the Riksbank's repo-rate decisions predictable?

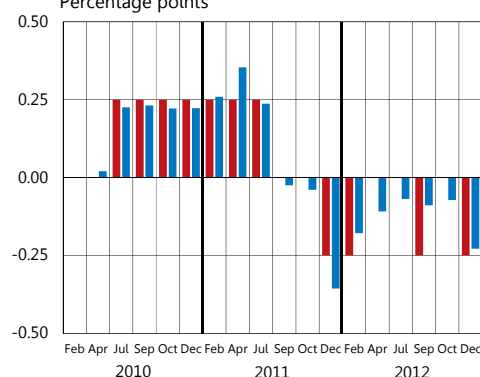
By comparing the Riksbank's repo-rate decisions in 2012 with market participants' expectations ahead of each monetary policy meeting one can gain an idea of to what extent the decisions were expected. Figure 5:1 shows the actual changes in the repo rate – cuts of 0.25 percentage points in February, September and December, and an unchanged repo rate at the other meetings – and a measure of the repo-rate changes that market participants were expecting prior to each monetary policy meeting.⁷² The difference between the columns thus gives a measure of how much the policy-rate decision surprised the market. This difference is shown in Figure 5:2.

In general, the repo-rate decisions in 2012 appear to have been slightly more difficult to predict than the decisions in 2010-2011. The main surprises appear to have been when the repo rate was held unchanged in April, as the market had expected a cut, and when the rate was cut in September, as the market was expecting the cut to come later in the autumn. The repo-rate cut in December was, however, well predicted by the market.

The Riksbank's repo-rate forecasts and various agents' expectations of the future repo rate

Expectations of the future repo rate are not directly observable, but can be estimated in two main ways: with the aid of surveys or by studying market pricing of forward rates. However, both methods are associated with various problems that may give rise to measurement errors.

Figure 5:1. Change in the repo rate and expected change according to the market
Percentage points

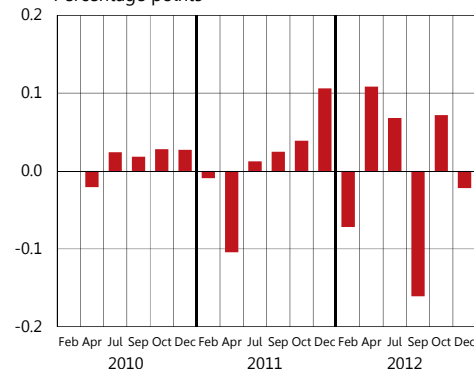


■ Change in the repo rate
■ Expected change according to the market

Note. See footnote 72 for further information.

Source: The Riksbank

Figure 5:2. Market surprise
Percentage points

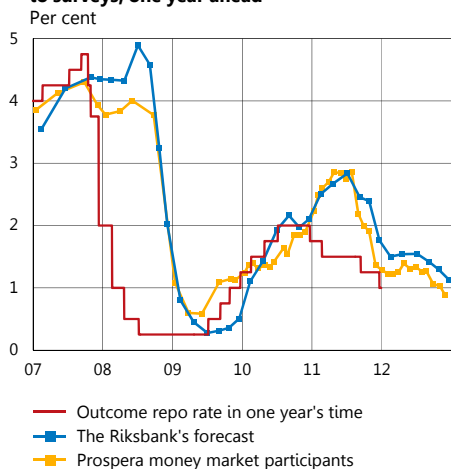


Note. Market surprise is measured as the change in a one-month interest rate at the time of the notification. See footnote 72 for further information.

Source: The Riksbank

⁷² The repo-rate change the market was expecting is calculated as an actual change minus a measurement of market surprise. The market surprise is defined as the difference between the actual change in the repo rate and the change expected by the market, and is calculated as the change in a 1-month interest rate between the day the decision is announced and the day before. As the 1-month interest rate is based on the average expected overnight rate one month ahead, an unexpected change in the repo rate will lead to a change of the 1-month interest rate on the day of announcement, when the new repo rate level has an impact. The Riksbank uses the so-called STINA swap rate for these calculations. It is not entirely clear where the line should be drawn between a "normal" surprise and a large surprise. The Riksbank's four-monthly follow-ups draw the line between a difference in actual and expected repo-rate changes of 5 basis points (0.05 percentage points).

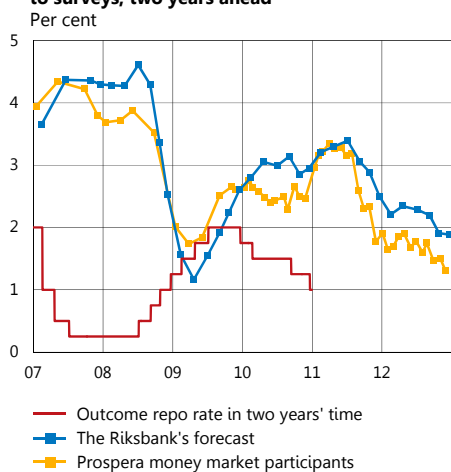
Figure 5.3. Outcome and the Riksbank's forecast for the repo rate and repo-rate expectations according to surveys, one year ahead



Note. The blue dots in the Figure represent the forecast of the repo rate one year ahead made by the Riksbank in conjunction with its monetary policy meetings. The yellow dots represent the money market participants' forecast of the repo rate one year ahead according to surveys. The outcome of the repo rate has been moved back one year to allow comparison with forecasts and expectations of the repo rate.

Sources: TNS SIFO Prospera and the Riksbank

Figure 5.4. Outcome and the Riksbank's forecast for the repo rate and repo-rate expectations according to surveys, two years ahead



Note. The blue dots in the Figure represent the forecast of the repo rate two years ahead made by the Riksbank in conjunction with its monetary policy meetings. The yellow dots represent the money market participants' forecast of the repo rate two years ahead according to surveys. The outcome of the repo rate has been moved back two years to allow comparison with forecasts and expectations of the repo rate.

Sources: TNS SIFO Prospera and the Riksbank

■ Interest rate expectations according to surveys

On behalf of the Riksbank, TNS Sifo Prospera conducts surveys to measure money market participants' expectations of how the repo rate will develop. The expectations shown by the survey responses can then be compared with the Riksbank's forecast for the repo rate.

Figure 5:3 presents such a comparison between the Riksbank's forecast and market expectations of the repo rate one year ahead. The first yellow dot in the figure thus shows what the market agents expected the repo rate to be in one year's time, according to the first survey in 2007. The first blue dot correspondingly shows the Riksbank's forecast for the repo rate in one year's time as presented in the first Monetary Policy Report in 2007. It should be noted that the time of the survey response and the time the Riksbank's forecast was made do not coincide exactly. This is shown in the figure, in that the yellow and blue dots are not exactly above or below one another. It means that the difference between repo-rate expectations and the Riksbank's repo-rate forecast may be due to new information received during the time between the survey responses and the monetary policy decisions. The red line in the figure shows the actual outcome for the repo rate, adjusted in time to facilitate a comparison with the expectations.

As shown in Figure 5:3, the Riksbank's repo-rate forecasts in 2012 largely pointed to continued downward adjustments in the repo rate one year ahead and this view was shared by the money market agents. However, the market agents expected a somewhat lower repo rate than the Riksbank had forecast. The difference between their assessments and the Riksbank's forecasts were on average 0.2 percentage points over the year.

Figure 5:4 shows the corresponding forecasts and expectations for the repo rate two years ahead, and the outcomes shifted in time two years. Here, too, the Riksbank and market participants have revised down their forecasts for the repo rate, but the difference between the assessments of the repo rate level at the end of the forecast period were greater than at one year ahead. During 2012 market agents were expecting that the repo rate two years ahead, that is, at the end of 2014, would on average be 0.4 percentage points lower than the Riksbank's forecasts indicated.

■ Interest-rate expectations according to market pricing

According to the expectations hypothesis, forward rates reflect market participants' expectations of the future repo rate.⁷³ In practice, however, forward rates do not only contain monetary policy expectations but also risk premiums. It is therefore necessary to adjust for these risk premiums when calculating interest-rate expectations.⁷⁴ However, adjusting for risk premiums is complicated, as they can be both positive and negative and vary over time in a way that is difficult to capture in the calculations.⁷⁵

⁷³ A forward rate relates to an interest rate for a future loan. When analysing monetary policy expectations the interest rate on an intraday loan is used. Forward rates can be read directly from market prices for forward contracts or be calculated implicitly from so-called spot rates (for example bond rates).

⁷⁴ The term risk premiums as used here is sometimes referred to as maturity premiums.

⁷⁵ See the article "Perspectives on monetary policy expectations and forward rates" in *Monetary Policy Report*, February 2013, Sveriges Riksbank.

Risk premiums are normally higher the longer the time horizon the interest rates refer to. A rule of thumb used by the Riksbank to adjust forward rates for an average risk premium is 1 basis point multiplied by the horizon stated in months.⁷⁶ The average risk premium for a forward rate two years ahead is thus assumed to be 24 basis points.

Figure 5:5 shows the Riksbank's forecast for the repo rate in one year, compared with the market agents' expectations of the repo rate one year ahead as indicated by implied forward rates.⁷⁷ Figure 5:6 shows corresponding comparisons two years ahead. The figures also show outcomes for the repo rate adjusted in time by one or two years.

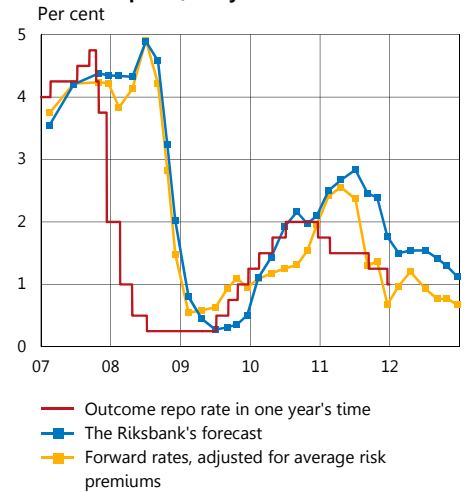
Figures 5:5 and 5:6 show that repo-rate expectations estimated on the basis of market pricing also differed from the Riksbank's forecasts for the repo rate. The differences are greater than for the surveys. For example, market pricing in December 2012 indicated that market participants expected a repo rate below 1 per cent two years ahead, while the Riksbank was forecasting that the repo rate would be just below 2 per cent.

There can be several possible explanations for the difference between these estimates of market participants' expectations and the Riksbank's repo-rate forecasts. One reason may be that money market participants have had a different view of future economic developments than the Riksbank, which would entail a different view of the future repo rate. Another reason could be that the risk premiums during these periods have been lower than the calculated average on which the Riksbank's adjustment of forward rates is based. This measurement error could lead to the usual measuring methods having exceeded the risk premium and thereby underestimated the actual expectations of the policy rate. Probably both of these factors contribute to explaining the difference, but it is difficult to determine to what extent. How high the repo rate will be in a year or two remains to be seen, of course.

■ Different views of future economic developments a possible explanation for the differences

If market participants expected weaker growth in Sweden and abroad than the Riksbank forecast, they may therefore have expected lower inflation than the Riksbank was forecasting. Differences in the macroeconomic assessments could thus have caused market participants to expect a lower repo-rate path than the one in the Riksbank's forecast.

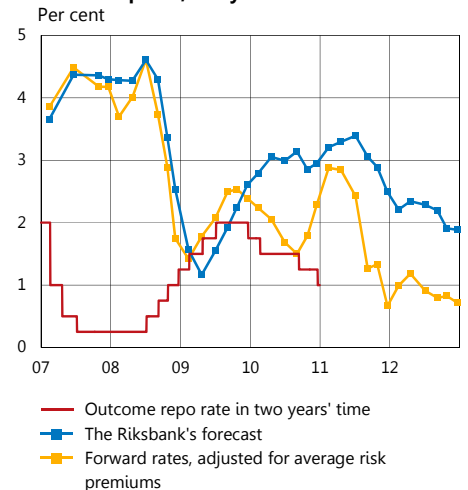
Figure 5:5. Outcome and the Riksbank's forecast for the repo rate and repo-rate expectations according to market prices, one year ahead



Note. The blue dots in the Figure represent the forecast of the repo rate one year ahead made by the Riksbank in conjunction with its monetary policy meetings. The yellow dots represent market expectations of the repo rate one year ahead calculated on the basis of market pricing. The outcome for the repo rate has been moved back one year to allow comparison with forecasts of the repo rate and market expectations. Forward rates are adjusted for average risk premiums corresponding to one basis point per month of the maturity period.

Sources: Reuters EcoWin and the Riksbank

Figure 5:6. Outcome and the Riksbank's forecast for the repo rate and repo-rate expectations according to market prices, two years ahead



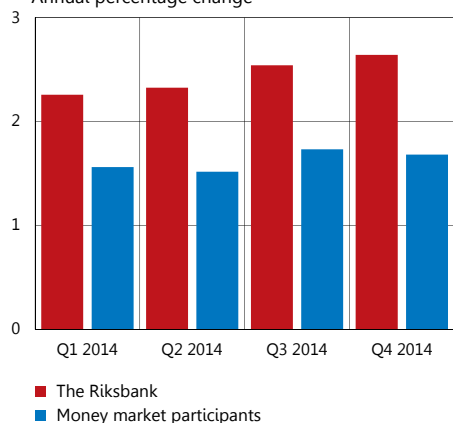
Note. The blue dots in the Figure represent the forecast of the repo rate two years ahead made by the Riksbank in conjunction with its monetary policy meetings. The yellow dots represent market expectations of the repo rate two years ahead calculated on the basis of market pricing. The outcome for the repo rate has been moved back two years to allow comparison with forecasts of the repo rate and market expectations. Forward rates are adjusted for average risk premiums corresponding to one basis point per month of the maturity period.

Sources: Reuters EcoWin and the Riksbank

⁷⁶ A basis point corresponds to a hundredth of a percentage point.

⁷⁷ Repo-rate expectations refer to market pricing on the day of publication of the Riksbank's repo-rate forecast.

Figure 5.7. The Riksbank's GDP forecasts and average GDP expectations among money market participants two years ahead, 2012
Annual percentage change



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

Sources: TNS SIFO Prospera and the Riksbank

The Riksbank does not have any information on exactly what assessment of economic developments is used as a basis for market participants' repo-rate forecasts. However, by comparing survey responses from money market agents and the Riksbank's forecasts of different variables such as GDP and inflation, an idea can be gained of possible differences in views of economic development. Figure 5:7 shows that money market participants' expectations of Swedish GDP growth two years ahead were lower in 2012 than the Riksbank's forecasts. Money market participants also on average expected a lower CPI inflation than the Riksbank (see Figure 3:15).

■ Measurement problems another possible explanation

Another explanation could be that the unease on the financial markets in recent years has led to the normal measurement methods based on forward rates overestimating the risk premium and thereby underestimating the actual expectations of the policy rate.

The financial unease led to increased demand for government securities and other investments that were perceived as safe. Interest rates in countries whose government securities are seen as safe investments may thus have fallen more than can be justified by expectations of future policy rates. Low or even negative risk premiums thus pushed down interest rates. Arbitrage trading – that is, buying and selling financial instruments to make use of imbalances in pricing between different markets – may, in turn, have led to interest rates with shorter maturities and for other fixed income instruments than government securities also being pushed down. This also applies to the forward rates that are normally used to measure monetary policy expectations.

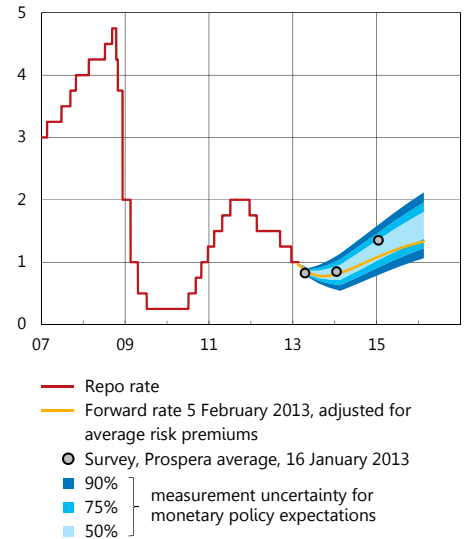
If the measurement methods do not take this into account, the risk premium is overestimated, which means that one adjusts for large risk premiums when calculating interest rate expectations. The expected repo rate would then appear to be lower than it is.

■ Measurement uncertainty can be estimated by combining information from different methods

As the different methods of measuring monetary policy expectations are not exact, a measurement uncertainty arises.⁷⁸ There are various methods for attempting to estimate monetary policy expectations on the basis of market pricing. Some methods try to disregard forward rates in risk premiums by estimating the average risk premiums for different time horizons. For example, the Riksbank's rule of thumb is based on these methods. The Riksbank also uses other methods that aim to calculate how the risk premium develops over time to thus obtain a measure of the risk premium on each individual occasion.

But different methods can give very different results, which shows how difficult it is to identify risk premiums. One advantage of surveys is that they give a direct measure of monetary policy expectations. However, surveys can also contain measurement errors, for instance, the sample may not be representative or the respondents may not have sufficient incentive to give responses that reflect their true expectations. By observing the spread between different methods' measure of market participants' interest-rate expectations, however, one can obtain an idea of the size of the measurement uncertainty (see Figure 5:8).⁷⁹

Figure 5:8. Interval that reflects the measurements uncertainty about monetary policy expectations
Per cent



Note. The width of the interval is calculated from the spread between different measures of monetary policy expectations for the respective horizons, plus an assumption of normally-distributed spreads. The interval is centred around the mean value of the Riksbank's ordinary measure of monetary policy expectations (Prospera surveys and forward rates adjusted for risk premiums).

Sources: Reuters EcoWin, TNS SIFO Prospera and the Riksbank

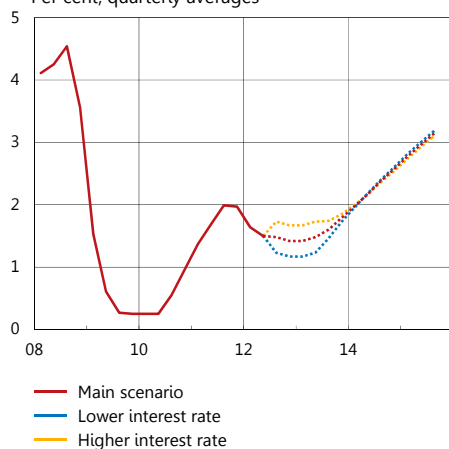
⁷⁸ *Measurement uncertainty* refers to uncertainty about what expectations the market participants have regarding the future repo rate. This concept differs from the term *forecasting uncertainty* which is the uncertainty that exists regarding what form monetary policy will actually take in the future.

⁷⁹ See the article "Perspectives on monetary policy expectations and forward rates" in *Monetary Policy Report*, February 2013, Sveriges Riksbank, for an example of how intervals for measurement uncertainty can be constructed. See also the article "the Riksbank's development work 2012-2013".

Appendix

Figure A1. Different interest-rate assumptions, July 2012

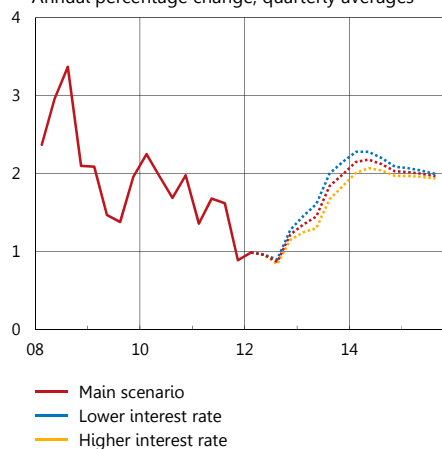
Per cent, quarterly averages



Source: The Riksbank

Figure A2. CPIF, forecasts in July 2012

Annual percentage change, quarterly averages

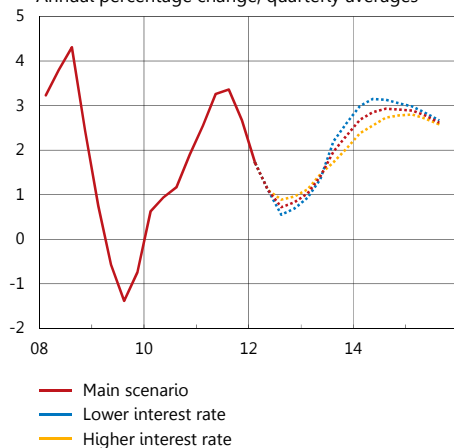


Note. The CPIF is the CPI with a fixed mortgage rate.

Sources: Statistics Sweden and the Riksbank

Figure A3. CPI, forecasts in July 2012

Annual percentage change, quarterly averages



Sources: Statistics Sweden and the Riksbank

Figure A4. Hours gap, forecasts in July 2012

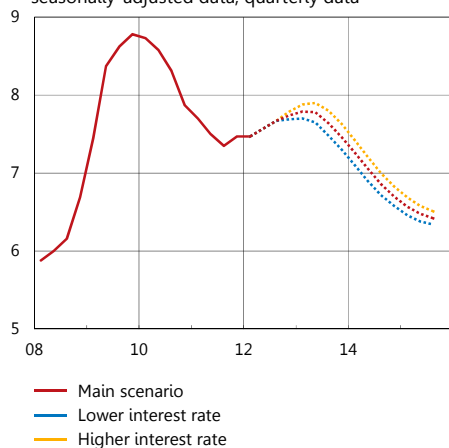
Per cent, quarterly data



Sources: Statistics Sweden and the Riksbank

Figure A5. Unemployment, forecasts in July 2012

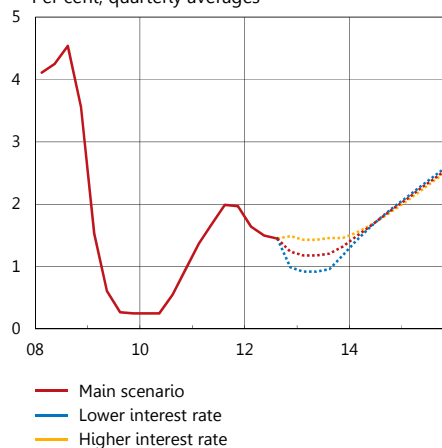
Per cent of the labour force, aged 15-74, seasonally-adjusted data, quarterly data



Sources: Statistics Sweden and the Riksbank

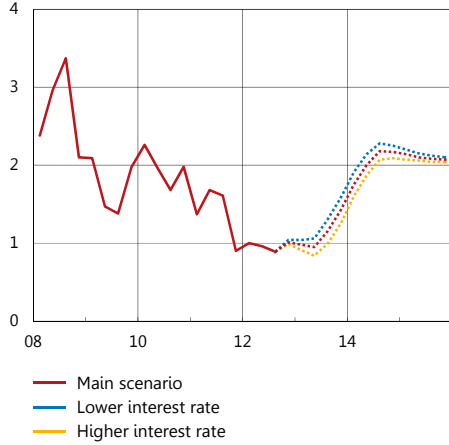
Figure A6. Different interest-rate assumptions, October 2012

Per cent, quarterly averages



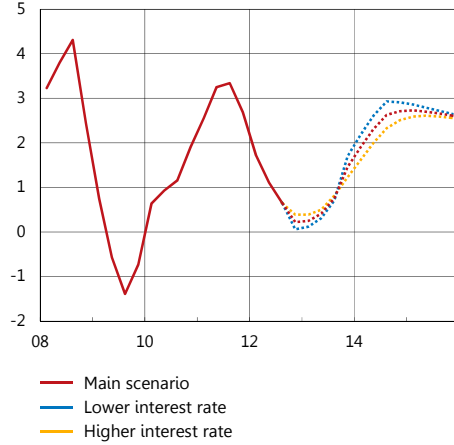
Source: The Riksbank

Figure A7. CPIF, forecasts in October 2012
Annual percentage change, quarterly averages



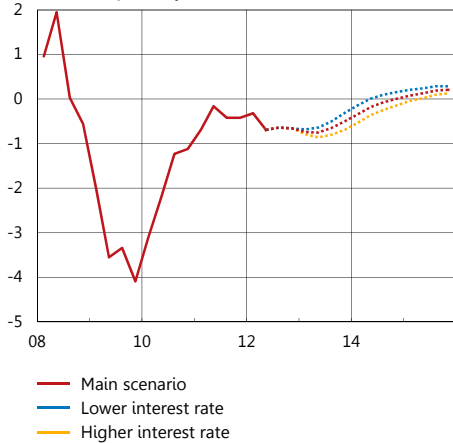
Note. The CPIF is the CPI with a fixed mortgage rate.
Sources: Statistics Sweden and the Riksbank

Figure A8. CPI, forecasts in October 2012
Annual percentage change, quarterly averages



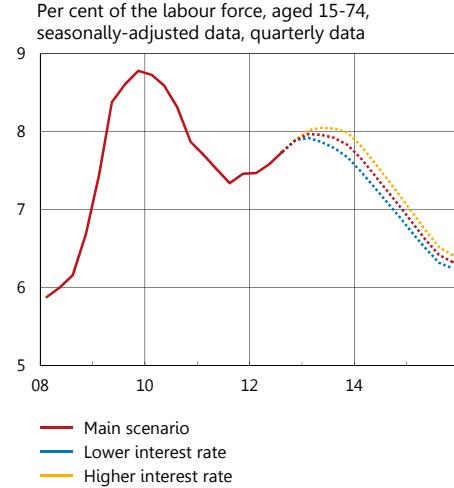
Sources: Statistics Sweden and the Riksbank

Figure A9. Hours gap, forecasts in October 2012
Per cent, quarterly data



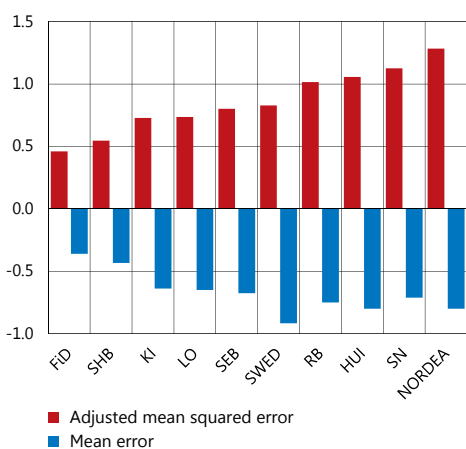
Sources: Statistics Sweden and the Riksbank

Figure A10. Unemployment, forecasts in October 2012
Per cent of the labour force, aged 15-74, seasonally-adjusted data, quarterly data



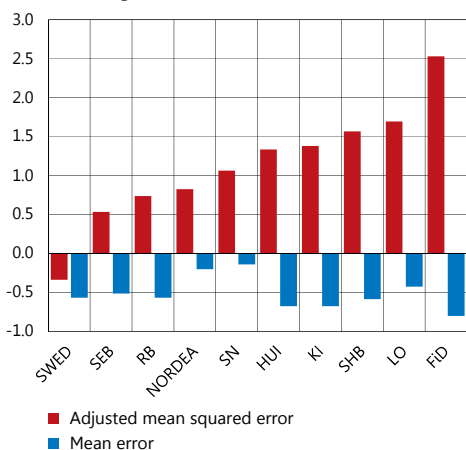
Sources: Statistics Sweden and the Riksbank

Figure A11. Forecasting errors of various forecasters for CPI inflation 2012



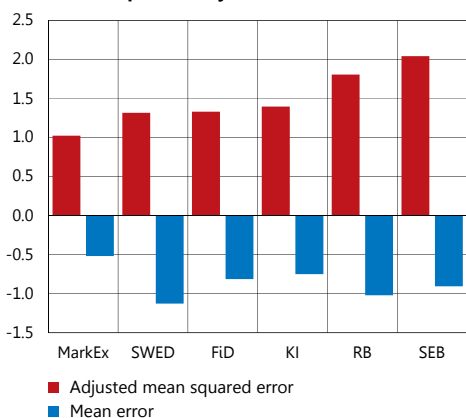
Note. FiD = Swedish Ministry of Finance, HUI = Swedish Retail Institute, KI = National Institute of Economic Research, LO = Swedish Trade Union Confederation, RB = the Riksbank, SHB = Svenska Handelsbanken, SN = Confederation of Swedish Enterprise and SWED = Swedbank.
Sources: Respective analysts and the Riksbank

Figure A13. Forecasting errors of various forecasters for GDP growth 2012



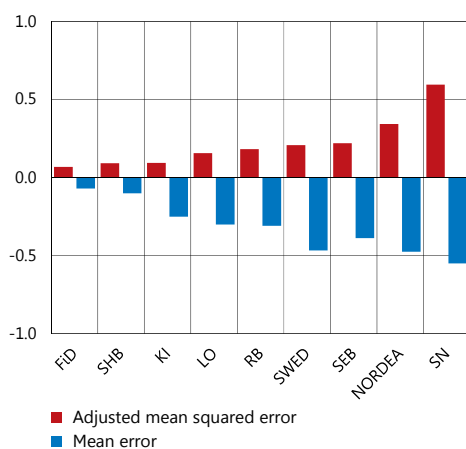
Note. See Figure A11 for an explanation of the abbreviations.
Sources: Respective analysts and the Riksbank

Figure A15. Forecasting errors of various forecasters for the repo rate at year-end 2012



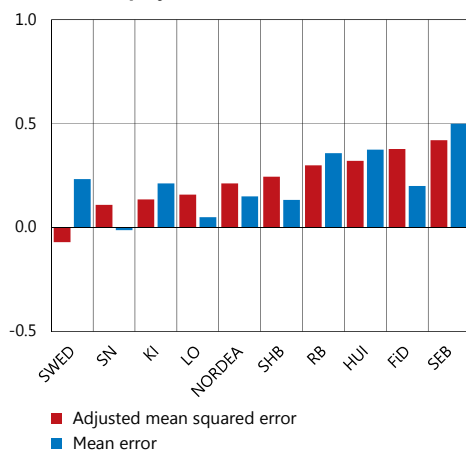
Note. See Figure A11 for an explanation of the abbreviations. MarkEx = Market expectations calculated on the basis of market pricing. Forward rates are adjusted for average risk premiums corresponding to one basis point per month of the maturity period. The Riksbank's quarterly forecasts have been interpolated to daily values to produce a value at the end of the year.
Sources: Respective analysts and the Riksbank

Figure A12. Forecasting errors of various forecasters for CPIX inflation 2012



Note. See Figure A11 for an explanation of the abbreviations.
Sources: Respective analysts and the Riksbank

Figure A14. Forecasting errors of various forecasters for unemployment 2012



Note. See Figure A11 for an explanation of the abbreviations.
Sources: Respective analysts and the Riksbank

Table A1. Test of all individually-specific effects being the same (H0) or of there being differences (HA)

P-value less than significance level rejects the null hypothesis

	GDP	Unemployment	CPI	CPIF	Repo rate
	0.89	0.09*	0.86	0.35	0.85

Note. The periods studied are 1999-2012 for GDP, unemployment and the CPI, 2007-2012 for the repo rate and 2008-2012 for the CPIF. Some of the forecasts in the period 2008-2009 are for the CPIX rather than the CPIF. * denotes that the result is significant at the 10-per cent level.

Source: The Riksbank

Table A2. Test of whether the Riksbank is as good as another forecaster (H0) or significantly better or worse than another forecaster (HA)

P-value less than significance level rejects the null hypothesis

	GDP	Unemployment	CPI	CPIF	Repo rate
FiD	0.47	0.42	0.57	0.48	0.41
HUI	0.24	0.87	0.96		
KI	0.29	0.36	0.73	0.95	0.52
LO	0.94	0.95	0.17	0.98	
Nordea	0.94	0.85	0.78	0.86	
SEB	0.99	0.04**	0.56	0.26	0.17
SHB	0.52	0.35	0.95	0.14	
SN	0.31	0.70	1.00	0.03**	
SWED	0.53	0.51	0.26	0.97	0.29
MarkEx					0.47

Note. The periods studied are 1999-2012 for GDP, unemployment and the CPI, 2007-2012 for the repo rate and 2008-2012 for the CPIF. Some of the forecasts in the period 2008-2009 are for the CPIX rather than the CPIF. ** denotes that the result is significant at the 5-per cent level. SEB makes significantly better forecasts of unemployment and SN significantly poorer forecasts of CPIF inflation. FiD = The Swedish Ministry of Finance, HUI = The Swedish Retail Institute, KI = The National Institute of Economic Research, LO = Swedish Trade Union Confederation, SHB = Svenska Handelsbanken, SN = The Confederation of Swedish Enterprise, SWED = Swedbank and MarkEx = Market expectations calculated on the basis of market pricing.

Source: The Riksbank

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