Material for assessing monetary policy 2004-2006

This box analyses inflation in 2006 and the monetary policy conducted in the period 2004-2005. Its purpose is to provide a basis for the Riksdag Committee on Finance's annual assessment of the Bank's monetary policy. Similar material is also included in the Riksbank's Annual Report for 2006.

In 2006, inflation was within the tolerance band of 1-3 per cent although it was below the target of 2 per cent. Inflation has been held back by favourable changes on the supply side of the economy, particularly rapid productivity growth. Inflation was lower than the Riksbank expected in the forecasts made in 2004, although well in line with the forecasts made in 2005.

Outcome and target fulfilment in 2006

Inflation was higher in 2006 than in 2005 and was within the tolerance bands of 1-3 per cent although still below the target of 2 per cent. CPI rose by an average of 1.4 per cent. Inflation was marginally lower measured by UND1X, 1.2 per cent on average over the year (see Table B1). CPI inflation was slightly higher than UND1X inflation partly because interest rates rose during the year. This led to higher interest expenditure for homeowners, which affects CPI inflation but not UND1X inflation. The limit on property tax introduced in 2006 worked in the opposite direction. This contributed to restraining the rate of inflation in CPI in relation to UND1X.

Table B1. Comparison of different inflation measures
Annual percentage change and standard deviation

	Annual average			Standard deviation		
	2006	1995-2006	1995-2006*	2006	1995-2006	1995-2006*
CPI	1.4	1.1	1.3	1.2	1.0	1.0
UND1X	1.2	1.5	1.7	0.3	0.8	0.8
UNDIMPX	-0.2	0.2	0.5	1.2	1.3	1.3
UNDIMPX excl. oil	-0.8	-0.2	0.2	0.5	1.5	1.5
UNDINHX	1.8	2.1	2.3	0.5	1.0	1.0

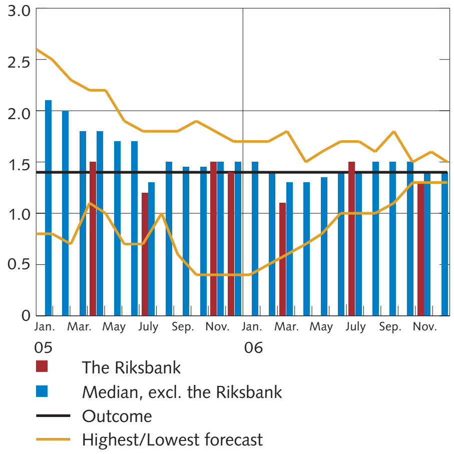
Note. Measure of inflation calculated according to the new definition that has been applied since January 2005. *Measures of inflation which for the period 1995-2004 were calculated according to the method used up to 1 January 2005 and which for 2005-2006 were calculated according to the new method. The standard deviation is calculated using monthly data for inflation (12-month change).

Sources: Statistics Sweden and the Riksbank

Like previous years, imported inflation was considerably lower than domestic inflation. UNDINHX, which is intended to measure prices of domestically produced goods and services, rose by an average of 1.8 per cent. UNDIMPX, which is intended to measure prices of imported goods and services, fell slightly, however.

An important reason why inflation was higher on average in 2006 than in 2005 was the sharp increase in energy prices. Excluding energy prices, UNDIX inflation was 0.5 per cent on average during the year, which was unchanged compared with 2005.

Figure B5. Forecasts for inflation (CPI) at different points of time in 2006, the Riksbank and other forecasters.
Annual average



Note. In comparison with other forecasters, forecasts are included from forecasters appearing in the list compiled by Consensus Economics Inc. (which includes, among others, the National Institute of Economic Research as well as Swedish and foreign banks), the Ministry of Finance, the Swedish Trade Union Confederation and some international organisations. The median is the forecast among other forecasters that in terms of its size lies closest to the middle. Compared to the mean value, the median is affected less by individual extreme values.

Sources: Consensus Economics Inc., the Ministry of Finance, the Swedish Trade Union Confederation, Statistics Sweden and the Riksbank

Relatively good level of accuracy in forecasts for 2006

A natural starting point when monetary policy is to be evaluated is to compare the outcome for inflation with the Riksbank's forecasts, since they serve as a basis for interest rate decisions.

One difficulty in a comparison of this kind is that the Riksbank's forecasts up to and including the second Inflation Report in 2005 were based on the assumption that the repo rate would not change during the forecast period. The forecasts were subsequently based on the assumption that the repo rate follows market expectations as these are reflected in the implied forward rates. This assumption facilitates an evaluation of the forecasts since it is normally more realistic.

The repo rate is normally changed during the forecast period and thus the outcome for inflation is affected. For this reason, it is difficult to obtain an exact view of the accuracy of the forecasts made on the assumption of a constant repo rate. However, some guidance can be obtained for the forecasts made in the first half of 2005. Alternative forecasts made with a repo rate that developed in line with implied forward rates were presented in boxes in the first two Inflation Reports in 2005. According to these, the difference for CPI inflation between the two ways of making forecasts on these occasions was considered quite small.

Monetary policy operates with a time lag and must therefore be forward-looking. It is therefore primarily the forecasts made in 2004 and 2005 which are relevant for an evaluation of target fulfilment in 2006.

In 2004, the Riksbank expected that inflation would rise gradually along with increasing resource utilisation in the economy. Inflation was expected to be close to 2 per cent at the end of 2006, which proved to be an overestimate. At the beginning of 2005, the inflation forecasts were adjusted downwards, however, over the whole forecast period. This was due, among other things, to a reassessment of price pressure in the economy. Different structural factors, such as intensified competition in several sectors, were considered to hold back inflation more than had previously been assumed. After this downward adjustment, the forecasts for inflation for 2006 were relatively accurate (see Figure B5).

The fact that inflation remained weak in 2006 was not due to an unexpectedly weak development of the economy. GDP growth in 2005, which can be assumed to have affected the inflation outcome in 2006, was, if anything, stronger than the Riksbank had expected (see Figure B6). It is notable that the forecasts at the end of 2004 and the beginning of 2005 were closer to the outcome than the forecasts later in 2005. This was partly due to the National Accounts statistics pointing initially to an unexpectedly weak growth at the end of 2004 and the beginning of 2005. The Riksbank's assessment was that the dip in economic activity was temporary although the forecast for growth was none the less adjusted downwards relatively sharply. In retrospect the dip in the level of activity proved to be more short-lived than expected and the outcome in the first quarter according to revised statistics was moreover not as weak as initially indicated. The result was that the

GDP forecasts for the whole year of 2005 produced during the rest of the year underestimated growth by a relatively large amount.

Figures B5 and B6 also show the forecasts for inflation in 2006 and GDP growth in 2006 made by other analysts. A comparison with a weighing together (the median) of inflation forecasts by others shows that the deviations in relation to the Riksbank's forecasts were generally small. Inflation in 2006 tended to be overestimated in the forecasts made at the beginning of 2005 (see Figure B5). In the course of 2005, other forecasters also adjusted their inflation forecasts downwards.

If a comparison is instead made between the Riksbank and individual forecasters, the Riksbank was among those with, on average, the smallest forecast errors for inflation in 2006 (see Figure B7).

Other forecasters also underestimated the strength of the upturn in a similar way as the Riksbank (see Figure B6). When comparing the size of forecast errors for GDP growth in 2005 made by different forecasters in 2004 and 2005, the Riksbank was below average (see Figure B8). The clearly largest forecast error for the Riksbank was the large downward revision made in the spring of 2005.

However, it is difficult to draw any general conclusions about the forecasting ability of different forecasters from these calculations of forecast errors, partly because of the shortness of the period (seven forecasting occasions for the Riksbank).

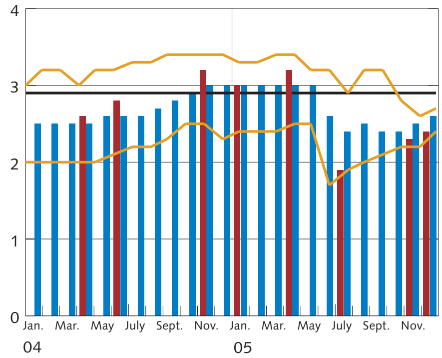
To sum up, inflation in 2006 was lower than the Riksbank expected in 2004, although the level of accuracy in the forecasts made in 2005 was satisfactory. The components of inflation developed in a different way than expected, however. Energy prices were considerably higher than the Riksbank expected while inflation excluding energy rose less than expected. At the same time, GDP growth in 2005 was stronger than the Riksbank and other forecasters generally assumed in the forecasts made in 2004 and 2005. The combination of low inflation and strong growth indicates that changes on the economy's supply side have continued to hold back inflation.

Higher productivity and low import prices

One main explanation for low inflation is that productivity growth has been surprisingly high in the economy in recent years. This has meant that it has been possible to increase output quickly without firms' unit labour costs increasing especially much. Costs even fell for a couple of years. In 2005, productivity growth slowed down which meant that unit labour costs then increased slightly. However, all in all, unit labour costs have none the less developed very favourably for firms recently (see Figure B9). The low cost increases have meant that there has been a limited need to raise prices.

The causes of the fast increase in productivity are not fully known. It is possible that the investments in information technology made at the end of the 1990s have started to generate results in recent years. It is also conceivable that the higher productivity growth is a result of firms in many sectors experiencing increased competition, not least

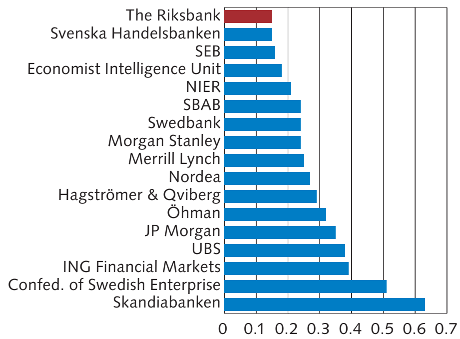
Figure B6. Forecasts for GDP growth at different points of time in 2005, the Riksbank and other forecasters
Annual average



Note. In comparison with other forecasters, forecasts are included from forecasters appearing in the list compiled by Consensus Economics Inc. (which includes, among others, the National Institute of Economic Research as well as Swedish and foreign banks), the Ministry of Finance, the Swedish Trade Union Confederation and some international organisations. The median is the forecast among other forecasters that in terms of its size lies closest to the middle. Compared to the mean value, the median is affected less by individual extreme values.

Sources: Consensus Economics Inc., the Ministry of Finance, the Swedish Trade Union Confederation, Statistics Sweden and the Riksbank

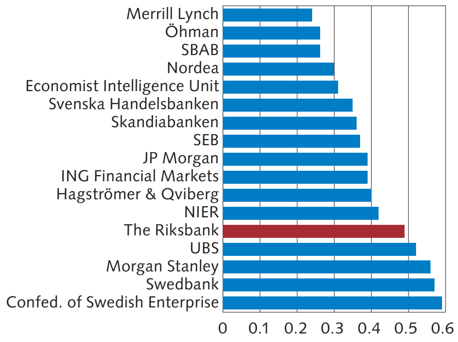
Figure B7. A comparison of forecast errors, the Riksbank and other forecasters
Average forecast error CPI inflation 2006



Note. The forecast error is calculated using the RMSE (root mean square error) and refers to errors made by each of the forecasters on average in their forecasts in 2005 and 2006 for inflation in 2006. The other forecasters included in the comparison are those appearing in the list compiled by Consensus Economics Inc.

Sources: Consensus Economics Inc. and the Riksbank

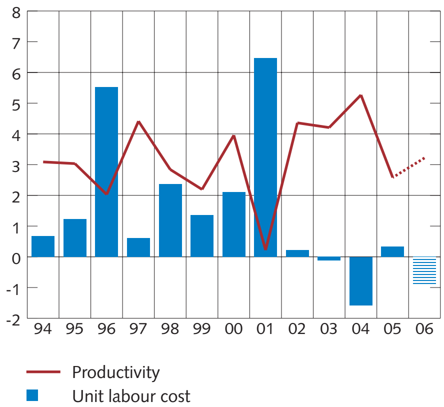
Figure B8. A comparison of forecast errors, the Riksbank and other forecasters
Average forecast error GDP growth 2005



Note. The forecast error is calculated using the RMSE (root mean square error) and refers to errors made by each of the forecasters on average in their forecasts in 2004 and 2005 for GDP growth in 2005. The other forecasters included in the comparison are those appearing in the list compiled by Consensus Economics Inc.

Sources: Consensus Economics Inc. and the Riksbank

Figure B9. Unit labour cost and productivity in the business sector
Annual percentage change



Note. Broken lines and striped bars represent the Riksbank's forecast. Calendar-adjusted data.

Sources: Statistics Sweden and the Riksbank

as a result of globalisation. Consequently, they have felt obliged to rationalise operations. With more efficient production processes, companies have then be able to meet higher demand without having to hire new employees to the same extent as in other upturns. Employment has therefore developed relatively weakly viewed in relation to the fast growth of output.

It is genuinely difficult to assess the sustainability of this type of change in the production conditions in the economy. The Riksbank's assessment in the forecasts made during 2004 and 2005 have been that productivity growth would gradually tail off in coming years, although it would none the less continue to be considerably higher than, for instance, in the 1980s. When productivity growth decreased in 2005, this reduction was approximately of the size expected by the Riksbank. However, during the first three quarters of 2006, productivity growth rose again.

The assessments are further complicated by revisions of data which can sometimes change the description of past events. For instance, productivity growth for 2004 was revised upwards considerably in connection with Statistics Sweden publishing the definitive national accounts for 2004 in November 2006.

Another supply factor that has contributed to low inflation is low increases in imported goods prices. Since early 2003, consumer prices for imported goods and services, excluding oil products, have fallen. The strong growth in productivity has contributed to the weak price development for imported goods as well since they are processed and distributed within Sweden before being sold to consumers. However, an illustration of the fact that other explanations exist is provided by producer prices for imported consumer goods, i.e. the prices in Swedish kronor when the goods enter Sweden, falling for a large part of recent years. At the same time, producer prices in the domestic market have risen, although moderately (see Figure B10).

The development of import prices is partly due to the exchange rate. The strengthening of the exchange rate since 2002 has contributed to the low prices for imported goods. The rise in the rate of price increases for imported goods in the second half of 2005 also coincided with a weakening of the Swedish krona. Another reason for falling import prices would seem to be a changed pattern of imports. A growing proportion of imports come from low-cost countries. Imports from China, for instance, have risen steadily in recent years. This shift in imports from low-cost countries is contributing to reducing the prices paid by Swedish importers. It is difficult to estimate the importance of this effect on the prices paid by Swedish consumers. In recent years, the Riksbank has gradually adjusted the forecast for the rate of consumer price increases downwards for imported goods and services (excluding oil products), but despite this it continued to be surprisingly weak in 2006.

32 See "RAMSES – a tool for monetary policy analysis" in this report.

Why inflation was below target – an analysis made using the Riksbank's macroeconomic model.

The Riksbank's macroeconomic model, RAMSES, can be used in the analysis of why the actual development of inflation differed from that forecast by the Riksbank.[32] The model describes the development of a dozen economic quantities such as GDP, consumption, investment, hours worked and inflation. The parameters in the model are determined by an econometric method intended to obtain as good a description as possible of the historical development of the Swedish economy.

To be able to study why inflation has been so low in recent years, the model must first clarify the type of shocks that have affected the economy in recent years, i.e. which driving forces there have been in the model. Thereafter, one driving force is excluded at a time and the model then shows how consumption, investment, GDP growth, inflation etc. would have developed in recent years in the absence of these driving forces. By making this analysis for each driving force and comparing the inflation outcome in each experiment, an idea can be obtained of which driving force or forces has or have been most important for low inflation.

An analysis of this kind shows that it is primarily high productivity growth through the rapid development of technology that has been the cause of low inflation in recent years. Figure B11 illustrates the actual inflation outcome and what inflation, according to the model, would have been in the absence of the driving force behind strong productivity. If productivity growth had not been unusually high from 2002, inflation would instead have been around 2 per cent in recent years, according to the model.

The results of this model analysis thus support the conclusions from the previous section, i.e. that unusually fast productivity improvements have contributed to holding back inflation in recent years.

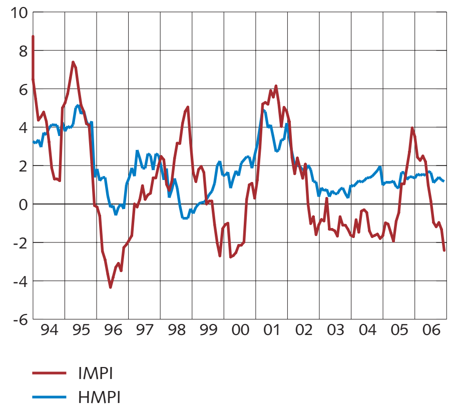
The monetary policy decisions of the Executive Board 2004-2005

The forecasts and assessments made in 2004 and 2005 served as the basis for the Executive Board's decisions to reduce the repo rate from 2.75 to 1.5 per cent on three occasions.

In February and March 2004, the repo rate was reduced by 0.25 and 0.5 percentage points respectively to 2 per cent. Inflation had fallen at the beginning of 2004. This was anticipated to some extent and related to the fast rise in the electricity price one year earlier no longer being included in the inflation figures. However, inflation was even lower than expected. The Riksbank made the assessment that the underlying inflationary pressure was probably even lower than previously assumed despite the international and domestic upturn becoming clearer. Lower import prices, a weaker labour market and higher productivity growth than previously forecast indicated more subdued wage and price pressures.

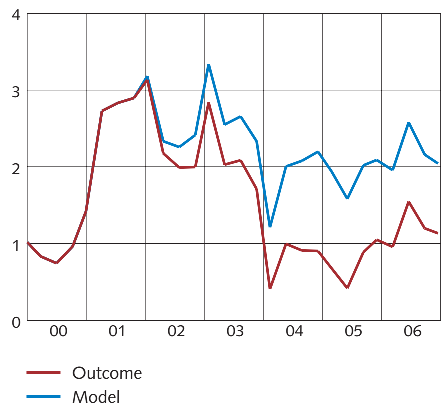
The repo rate was unchanged for the rest of 2004. The Riksbank's view of the development of economic activity in Sweden became more and more optimistic in the summer and autumn, when new

Figure B10. Producer prices for consumer goods according to the home market price index (HMPI) and import price index (IMPI)
Annual percentage change



Source: Statistics Sweden

Figure B11. The inflation outcome and inflation in the absence of shocks to productivity growth according to the Riksbank's macroeconomic model
Annual percentage change



Note. UND1X inflation.
Sources: Statistics Sweden and the Riksbank

information indicated an increasingly strong international and domestic development. It was considered that there were reasons to expect that the economy would continue to strengthen in the future and the growth forecast was adjusted upwards for both 2004 and 2005. Inflationary pressure was then also expected to increase apace with rising resource utilisation. This indicated that monetary policy would eventually have to be less expansionary. Low cost increases, partly due to continued high productivity growth, contributed to the rise in inflation being considered as moderate.

At the beginning of 2005, the available information indicated that growth had slackened somewhat. It was still considered that the Swedish economy would develop well, even if it was assumed that it would enter a calmer phase in the future. Resource utilisation was expected to gradually increase and entail rising inflation. However, the rise in inflation was expected to take place more slowly than the Riksbank had previously forecast. Various structural factors, such as stiffer competition, were considered to dampen inflation more than had previously been forecast.

During spring 2005, there was increased uncertainty about the strength of the upturn. A number of indicators of the level of activity

Repo rate decisions 2004

5 February: The repo rate was lowered by 0.25 percentage points to 2.5 per cent. Kristina Persson entered a reservation against the decision. She recommended instead that the repo rate be cut by 0.5 percentage points with reference to the fact that the inflation forecast in December 2003 had already pointed to room for a rate cut and that developments thereafter were indicating even weaker price pressures, partly because productivity growth had continued to improve.

31 March: The repo rate was lowered by 0.5 percentage points to 2.0 per cent. Villy Bergström and Eva Srejber entered a reservation against the decision, believing instead that the repo rate should be cut by only 0.25 percentage points. They recommended greater caution with monetary policy stimulation, partly to avoid encouraging increased household indebtedness. Another reason was uncertainty about the strength and duration of the productivity development and the growing international competition which held inflation back despite an expansionary economic policy in a number of places around the world.

28 April: The repo rate was left unchanged at 2.0 per cent.

27 May: The repo rate was left unchanged at 2.0 per cent.

23 June: The repo rate was left unchanged at 2.0 per cent.

19 August: The repo rate was left unchanged at 2.0 per cent.

13 October: The repo rate was left unchanged at 2.0 per cent.

8 December: The repo rate was left unchanged at 2.0 per cent.

Repo rate decisions 2005

27 January: The repo rate was left unchanged at 2.0 per cent.

14 March: The repo rate was left unchanged at 2.0 per cent.

28 April: The repo rate was left unchanged at 2.0 per cent.

20 June: The repo rate was lowered by 0.5 percentage points to 1.5 per cent.

23 August: The repo rate was left unchanged at 1.5 per cent.

19 October: The repo rate was left unchanged at 1.5 per cent.

1 December: The repo rate was left unchanged at 1.5 per cent. Villy Bergström, Lars Nyberg and Eva Srejber entered a reservation against the decision, believing instead that the repo rate should be raised by 0.25 percentage points. They considered that there were more indications of a stable and sustainable upturn in economic activity and that it was now desirable to initiate the gradual tightening of monetary policy that they anticipated. This in order to reduce the risk of a further weakening of the krona due to rising interest rates in Europe and so that increased interest rates would send a signal to the housing market that the present price rises were unsustainable.

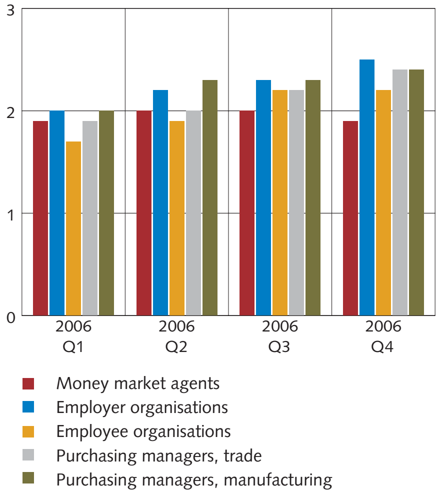
in the economy pointed to a weaker development than expected. In June, the repo rate was reduced by 0.5 percentage points to 1.5 per cent. The foremost reason was that newly received national accounts statistics showed that the economy had grown considerably more slowly than expected at the end of 2004 and the beginning of 2005. The growth forecast was therefore adjusted downwards relatively sharply in the short term. However, the assessment was that it concerned a temporary slowdown and that most indicators pointed to relatively good growth in the future.

The repo rate remained unchanged for the rest of 2005. The view that the weak growth was only temporary received increasing support and revised statistics showed moreover that the level of economic activity at the end of 2004 and beginning of 2005 had been stronger than it had at first appeared. The more expansionary monetary policy contributed to some upward adjustment of the forecasts for growth and inflation. However, the assessment was that inflation would increase in the future albeit at a rather moderate rate. It was increasingly clear that the economy approached a position where monetary policy needed to be rearranged in a less expansive direction.

Inflation expectations

If inflation expectations are stable and close to the inflation target in a couple of years time, this is an indication that the public is confident that the Riksbank will achieve its target. A high level of confidence in the inflation target increases the ability to take other factors into consideration in the conduct of monetary policy, such as growth and employment. Figure B12 shows inflation expectations for 2008 among the money

Figure B12. Different agents' expectations of inflation for 2008 in 2006
Per cent



Source: Prospera Research AB

market participants, employer and employee organisations and purchasing managers in trade and industry. Even if inflationary expectations have increased slightly during 2006 among most of these actors, confidence in the inflation target continues to be strong. Inflation expectations in two years time are gathered well around the 2 per cent target.

Summary

Inflation was higher in 2006 than in 2005 and within the tolerance band of 1-3 per cent but it was none the less below the target. Inflation in 2006 was lower than the Riksbank expected in the forecasts made in 2004, although well in line with the forecasts made in 2005. However, the components of inflation developed differently than expected. Energy prices contributed to pushing up inflation more than anticipated. At the same time, inflation adjusted for energy prices was lower than expected.

The low inflation was not a result of weak growth in the economy. GDP growth in 2005, which can be assumed to have affected the inflation outcome in 2006, was, on the contrary, robust and underestimated in the Riksbank's forecasts.

The combination of low inflation and high growth indicates that the economy was affected by changes on the supply side of the economy. Above all, it related to productivity growth, which was again surprisingly high. High productivity growth contributes to keeping down firms' costs and demand can then increase without pressure being created to raise prices at an excessively fast pace. Fundamentally, the changes affecting the Swedish economy in recent years have been beneficial.

As a consequence of the low inflationary pressure in the economy, the Riksbank has conducted a highly expansionary monetary policy despite robust growth. The period of repo rate cuts initiated at the end of 2002 continued in 2004 and 2005. The repo rate was reduced on two occasions in the spring of 2004 and once in mid-2005. The reduction in 2004 was motivated by inflation falling more than expected and by the fact that underlying inflationary pressure was probably lower than previously expected. The reason for the repo rate cut in 2005 was that there were indications of a sharp weakening in economic activity, albeit temporary.

With these cuts, the repo rate had been reduced to a historically low level of 1.5 per cent. During 2005, the Riksbank none the less expected that inflation would be low in 2006, albeit rising. This assessment was based on the assumption that various structural changes, including high productivity growth, would continue to have a restraining effect on inflation. At the same time, demand was expected to show strong growth, partly due to the expansionary monetary policy. The low interest rates had also led to a rapid rise in household borrowing and house prices. It was therefore not considered reasonable to push up inflation at a faster pace through further cuts in the repo rate. During the autumn of 2005, it appeared instead increasingly clear that the repo rate would have to be gradually increased to ensure that inflation was on target in a couple of years time.