



Inflation Report

1/2003

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■ Foreword

The Riksbank's monetary policy is targeted at keeping inflation at 2 per cent, with a tolerance for deviations up to ± 1 percentage point.

The Riksbank uses several different methods of communicating monetary policy issues and positions. The Inflation Report reproduces the Riksbank's overall view of future inflation at the present time. Press releases are used to report the Executive Board's monetary policy considerations and decisions. Executive Board members may differ in their opinions about how inflation's main determinants will develop and the resulting impact on future inflation. Minutes from the Board's monetary policy meetings provide an account of the members' assessments and individual positions on various proposals and decisions made.

This Inflation Report reproduces the main features of the presentations and discussions of inflation at the Executive Board meetings on 6 and 12 March 2003. The Report constitutes the background to the Bank's monetary policy decision on 17 March. Any divergent opinions of inflation prospects are recorded in the separate minutes of the Board meeting on 17 March, to be published on 28 March 2003.

According to Chapter 6, Article 4 of the Sveriges Riksbank Act (1988:1385), the Riksbank is obliged to provide a written report on monetary policy to the Riksdag Committee on Finance at least twice a year. The Riksbank has chosen to use two of the year's four Inflation Reports for this purpose. This report constitutes one such account to the Riksdag.

The Inflation Report aims to provide a basis for monetary policy decisions and spread an awareness and knowledge of the Riksbank's assessments to a wider public, so that monetary policy is easier for outsiders to follow, understand and evaluate. The Report is also intended to encourage a discussion of matters relating to monetary policy.

This Report presents the Riksbank's appraisal of inflation prospects up to the end of 2005 Q1. In order to clarify the consequences for monetary policy, the analysis starts from the technical assumption that in this period the repo rate is left unchanged.

Chapter 1 presents the Riksbank's overall assessment of inflation prospects in the main scenario and the spectrum of risks. Chapter 2 contains a discussion of the most probable development of the principal determinants of inflation. The report also contains a number of boxed texts, the purpose of which is to provide additional knowledge about matters of importance for inflation assessments and the formation of monetary policy. One of these boxes provides material for assessing the monetary policy pursued during 2000-2002.

Stockholm, March 2003

Lars Heikensten

GOVERNOR OF SVERIGES RIKSBANK

■ Inflation assessment

The general assessment of inflation prospects up to the end of 2005 Q1 is presented in this chapter, given the technical assumption that the repo rate is held unchanged at 3.75 per cent.

Summary

At the end of last year inflation developed largely in line with the assessment in the December Inflation Report. However, this year inflation has risen more than anticipated, mainly as a result of higher electricity prices, but also partly due to rising oil prices. The rise in electricity prices is explained partly by a water shortage in the hydroelectric power companies' reservoirs after the dry summer (see also the Box "The price of electricity and inflation"). In January CPI inflation for the past 12-month period was 2.8 per cent and UND1X inflation 2.6 per cent. The upswing in energy prices is assessed to be essentially of a temporary nature and inflation is expected to begin to fall back as early as late spring.

If energy prices are excluded, CPI and UND1X inflation fell to 1.7 per cent and 1.8 per cent respectively in January (see the Box entitled "Recent developments in inflation"). The downturn was to some extent due to falling food prices. It is probable that less strain on resources and a lower rate of increase on labour costs also contributed. Price pressure from the rest of the world has remained low. The assessment is that there will be some unutilised resources during the forecast period and that pressure from costs will be relatively weak. Imported inflation is expected to increase only marginally, partly due to a stronger krona. Inflation excluding energy prices is expected to amount to approximately 2 per cent during the entire forecast period. At the end of the period, when the effects of energy price changes have subsided, CPI inflation as a whole is anticipated to be approximately 2 per cent, while UND1X inflation is expected to be slightly lower at 1.8 per cent.

Economic growth in both Sweden and the rest of the world showed some recovery during last year, but the recovery slowed down towards the end of the year. The weaker development was to some extent expected, but the large euro countries experienced a stronger slowdown in growth than anticipated. In other parts of the world, primarily Asia, growth was good. The adjustment of corporate and household balance sheets in the wake of the sharp decline on the stock market over the past two years has had a restraining effect on both investment and consumption. Geopolitical developments since the acts of terrorism in September 2001, and in particular over the past six months, have probably contributed to greater pessimism and created an insecurity that has hampered economic activity and global trade. The risk of a war in Iraq has been the main factor behind this development.

These factors are expected to continue influencing the economy in the near future, which will make the recovery somewhat slower than was assumed in the previous Inflation Report, despite the fall in interest rates and the fact that fiscal policy in the United States has been more expansionary. Global market growth is expected to be slightly more subdued initially, primarily due to a weaker development in the euro area, and then to attain more normal growth rates towards the end of the forecast period. This will give a slightly poorer development for Swedish exports this year. Manufacturing activity in Sweden is also expected to be

slightly weaker as a result of lower domestic demand. In addition, continued problems in the telecommunications sector are expected to act as a damper. Lower share prices, higher taxes, higher unemployment and continued uncertainty over the economic picture are expected to contribute to a slightly lower increase in consumption. The current uncertainty is also expected to lead to the large upswing in investment being postponed somewhat. The forecast for growth in Sweden in 2003 has thus been revised downwards.

The basic economic picture presented in December, with a continuing gradual recovery in economic activity, still holds. Expansionary economic policy, companies' stockbuilding and with regard to Sweden a relatively weak krona all indicate increased economic activity. It is assumed in the main scenario that the economic consequences of the Iraq conflict will be limited and that the uncertainty that has hampered economic activity will tangibly subside during the second half of this year (see also the Box "The economic consequences of a military conflict in Iraq"). All in all, growth rates in the OECD area are expected to be around 2 per cent this year and just over 2.5 per cent a year during the remainder of the forecast period. The corresponding figures for Sweden are 1.7 per cent in 2003 and 2.4 per cent in 2004 and 2005.

New estimations of the output gap, based on revised National Accounts figures, as well as other indicators of resource utilisation indicate there are at present unused resources in Sweden. This is also assessed to be the case in Europe and the United States, to an even higher degree. The forecast growth rates for Sweden, Europe and the United States mean that resource utilisation will remain relatively modest during the entire forecast period (see Figure 1). The downward revision in growth prospects for Sweden and the fact that the new National Accounts figures indicate that resource utilisation is and has been slightly less strained than was assumed in earlier assessments. However, it should be emphasised that the estimations of resource utilisation are associated with great uncertainty.

The relatively moderate international resource utilisation is expected to lead to relatively weak price pressure in the rest of the world, despite slightly higher oil prices. It is only towards the end of the forecast period, when capacity utilisation rises, that international export prices are expected to increase by almost 2 per cent. It is assessed that an appreciation in the krona will dampen inflationary effects of rising international prices in Sweden. However, the appreciation this year is expected to be lower than the earlier assessment, which together with higher oil prices will lead to import prices rising slightly more than was previously expected in the short term. During 2004 imported inflation is expected to develop somewhat more weakly than anticipated in the previous assessment, because of a fall in oil prices.

Wage cost increases in the private sector are also anticipated to be slightly lower than was previously forecast, on the basis of a slightly higher level of unemployment in the near future. The revised National Accounts figures indicate that productivity growth in the Swedish economy was slightly stronger during the 1990s than was previously estimated. Given this, productivity is expected to be able to develop more strongly this year than was anticipated in earlier assessments. Altogether this should give a slightly lower rate of increase in labour costs than was previously assumed.

During the forecast period as a whole, therefore, less strain on resource utilisation and the slightly lower labour costs are expected to lead to lower

inflation than was anticipated in the December report. On average, however, the CPI is expected to increase by 2.5 this year, compared with the forecast of 2.1 per cent in December, which is largely due to the higher energy prices. During 2004 the average will be pushed down by lower energy prices and is expected to be 1.5 per cent. UND1X inflation is expected to be 2.4 per cent this year and 1.2 per cent in 2004. Excluding energy, UND1X inflation is expected to increase by an average of around 2 per cent during both years.

Looking one year ahead (March 2004), UND1X inflation is estimated in the main scenario to amount to 0.8 per cent and looking two years ahead (March 2005) to be 1.8 per cent. The corresponding figures for CPI are 1.0 and 2.0 per cent respectively (see Figure 4 and Table 1).

The spectrum of risks is also relevant for the formation of monetary policy. The primary downside risk for Swedish inflation is connected with the uncertainty over economic developments in the rest of the world. This mainly concerns the risk of a weaker economic growth in the euro area. Counteracting this is the risk that inflation could be higher than anticipated in the main scenario, partly as a result of greater price contagion effects from higher energy prices and partly as a result of a higher than expected outcome in wage bargaining rounds during the autumn. On top of this comes a risk of more negative effects on growth from the geopolitical situation. This entails both upside risks for inflation connected with price and cost increases and downside risks connected with the demand situation. All in all, the spectrum of risks is assessed to be balanced.

The main scenario assumes that the negative macroeconomic repercussions of the Iraq crisis will be limited. However, it is very difficult to assess how a possible war might develop and how long it would last. The threat of a military attack on Iraq creates an uncertainty that affects both confidence in the future and stock markets, which causes problems in interpreting economic signals correctly. The more prolonged the Iraq crisis is, the greater the risk of more serious real economy effects for the global economy. The geopolitical situation thus creates genuine uncertainty and contains threats that cannot normally be taken into account in the risk analysis.

The main scenario

At the beginning of 2002, economic activity showed clear signs of improvement. Economic policy was expansionary in many countries, including Sweden. Companies' stockbuilding indicated that the business cycle had bottomed out and increased demand for durable consumer goods in the United States and even in Sweden implied an improvement in economic activity. Preliminary results for 2002 received so far indicate that growth was roughly as expected, with the exception of the euro area, where it looks to have been weaker. At the same time, the growth cycle appears to have been slightly different. The recovery came to a halt and growth was subdued during the second half of the year. The subdued economic activity is due to a continued increase in private sector saving in the wake of the sharp decline on the stock market over the past two years, as well as to security policy developments.

Share prices have fallen by 20 per cent in Europe and by around half that much in the United States since the December report. This fall can be interpreted to mean that financial market participants expect developments to remain weak. As a result of the continued uncertainty, asset prices are

anticipated to develop rather weakly this year, and then to rise in line with the previous assessment. Long bond rates have fallen by 0.6 percentage points in the euro area and the United States since the previous Inflation Report. The expectation now is for slightly lower interest rates as a result of the weaker growth.

■ ■ Rising oil prices and great uncertainty in the wake of the Iraq crisis.

One factor indicating slightly more subdued growth in future is oil prices, which are currently at around USD 10/barrel higher than was forecast in the December report. The high oil prices are due to several factors, mainly greater uncertainty over a potential war in Iraq and its outcome, but also to a reduced supply because of the strikes in Venezuela, the world's fifth largest oil producer, at the end of last year. At the same time, the cold winter weather in the northern hemisphere has increased demand. All in all, this has contributed to oil stocks in the United States being at their lowest for almost 30 years. Forward rates have also risen recently (see Figure 2). At the beginning of this year oil prices are expected to remain at their present high levels. They are then expected to return to the levels noted in the autumn, prior to the large increase, which is also in line with the longer term forward rates. Oil prices are expected to average just under USD 28/barrel in 2003, which is approximately USD 4/barrel higher than was forecast in December.

■ ■ The recovery in the global economy will be more long drawn-out...

The uncertainty prevailing in the global economy as a result of stock market falls, the Iraq crisis and its repercussions makes it more difficult than usual to interpret the economic indicators and to predict economic developments. However, an increasing number of indicators lean towards a more prolonged, slower recovery in economic activity. Developments over the coming year are therefore expected to be slightly more subdued than was forecast in December. However, there is no reason to change the basic economic picture presented then. Most indications are nevertheless that economic activity will strengthen in 2003.

In an international perspective, it is mainly the prospects for the euro area that look slightly poorer than was anticipated in December. Manufacturing activity and consumption weakened tangibly at the end of last year. Unemployment is rising, while the weak budgetary growth limits fiscal policy scope for action. The strong euro and higher oil prices are also expected to subdue the upswing in manufacturing activity. The fact that inflation is not more subdued could indicate that potential growth is lower than was previously assessed, which could further curb growth.

■ ■ ...but will nevertheless occur.

In the United States there are signs that the recovery is continuing. Household consumption is stimulated by an expansionary economic policy with tax reductions and low interest rates. A recovery in manufacturing activity was discernible towards the end of last year; both production and investment increased. This could indicate that the adjustment in capital stocks following the over-investment in some industries at the end of the 1990s is now coming to an end. Confidence indicators, such as the purchasing managers' index, also imply an upswing in manufacturing activity. Continued low interest rates and the weak dollar are anticipated to provide support to manufacturing, while high oil prices will have a negative effect. Although the labour market situation has deteriorated, it is expected to stabilise during the second half of this year.

All in all, growth in the rest of the world could be slightly weaker this year than was assumed in the December Inflation Report. However, growth will pick up towards the end of the year and is expected to amount during 2004 and 2005 to around 2.5 per cent in Europe and to between 3 and 3.5 per cent in the United States. As a result of the uncertainty arising from the Iraq crisis and the slightly lower demand in the euro area, trade and global market growth are expected to be weaker this year than previously assessed. At the end of the forecast period market growth is expected to reach the average historical level of around 7 per cent.

Internationally, capacity utilisation, the labour market and other measures of resource utilisation seem to indicate there are unutilised resources. A relatively low level of demand is expected to lead to unutilised resources in the large economies during the entire forecast period and price increases are thus expected to be relatively modest. In the short term, inflation is nevertheless expected to rise due to higher energy prices. However, international export prices are expected to continue to show a weak growth rate that will not reach around 2 per cent until the end of the forecast period.

As in earlier assessments, the krona is expected to appreciate during the forecast period. This will subdue the effect of rising international price pressure on Swedish inflation. Compared with the forecast in December, however, the krona appreciation is expected to come slightly later this year. This is partly explained by the general unease on financial markets around the world having a negative effect on the krona at the beginning of the year. The pension funds' purchases of foreign securities have probably also contributed to a weak krona development.

■ ■ Household consumption increasing at a slower rate.

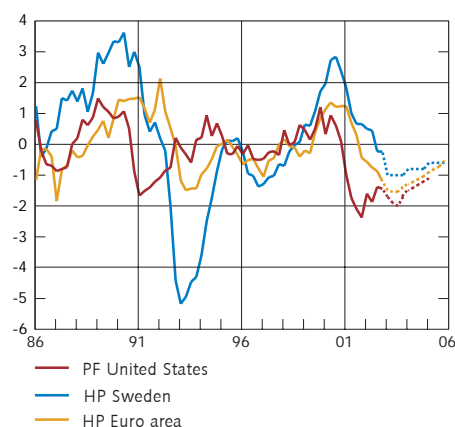
The cyclical recovery in Sweden that started in early 2002 came to a halt at the end of the year. Export prices developed weakly and industrial production stood still. New business tendency data also indicates a slightly poorer development in future compared with the assessment in the December report. Households' expectations regarding their own financial situations became more pessimistic during the autumn. Higher taxes, rising electricity prices, higher unemployment, falling share prices and prolonged uncertainty with regard to economic developments and the outcome of the Iraq crisis appear to have had a more negative effect on household confidence than was expected. Future consumption growth is thus expected to be slightly lower than was previously estimated.

There are as yet few signs of an upswing in manufacturing activity. However, the purchasing managers' index and business tendency data imply rising optimism and production is expected to increase in certain industries that are usually early in the economic cycle, such as metal, steel and forestry. Recently, an improvement has also been noted in the telecom industry. However, construction activity remains weak, despite high house prices and a housing shortage in metropolitan regions.

All in all, growth in the Swedish economy is expected to be 1.7 per cent this year, which is lower than the assessment in December. During the remainder of the forecast period growth is expected to amount to 2.4 per cent a year, which is largely unchanged, compared with the previous forecast. However, the growth composition is expected to be slightly different. Consumption is expected to increase at a slightly slower rate and net exports slightly faster.

With regard to the labour market, the number of hours worked and the

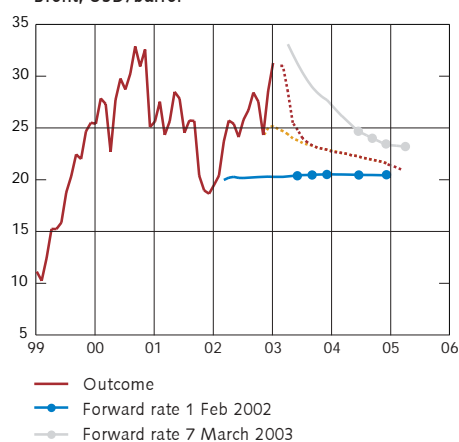
Figure 1. Output gap for the euro area, Sweden and the United States.
Per cent



Note. HP is what is known as the Whittaker-Henderson or Hodrick-Prescott filter. The GDP series have been adjusted for trends using an HP filter. PF is the production function approach.

Sources: Bureau of Labor Statistics, Eurostat, NiGEM, Statistics Sweden, the US Department of Commerce and the Riksbank.

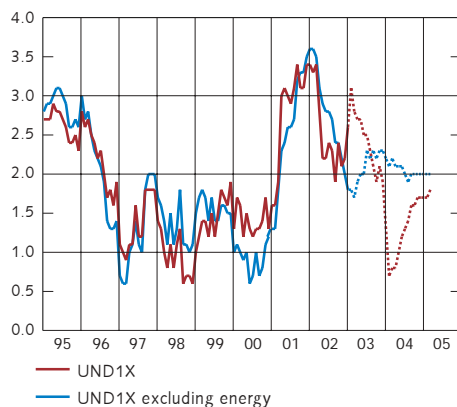
Figure 2. Oil prices, spot prices and forward rates at different times and forecasts.
Brent, USD/barrel



Note. Yellow broken line refers to the Riksbank's forecast in IR02:4. Red broken line refers to the Riksbank's forecast in IR03:1.

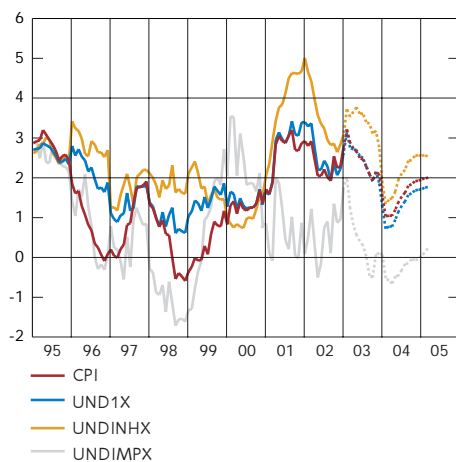
Sources: IPE and the Riksbank.

Figure 3. UND1X including and excluding energy. Percentage 12-month change



Sources: Statistics Sweden and the Riksbank.

Figure 4. Different measures of inflation, outcome and forecasts. Percentage 12-month change



Sources: Statistics Sweden and the Riksbank.

amount of overtime continued to fall at the end of last year. A continued decline in employment is expected this year, with a break in the trend not expected until 2003, when there will be an increase in the number of hours worked. The slightly weaker demand in the economy this year is expected to lead to slightly higher unemployment. New estimations of the production gap, based on revised National Accounts figures, as well as other indicators of resource utilisation in the economy, also imply more unutilised resources in the economy than was anticipated. The assessment made in the main scenario is that there are unutilised resources in the economy for the entire forecast period and that this will have a subduing effect on the development of inflation, compared with previous forecasts.

The rate of wage increase has been slightly lower than expected. The higher level of unemployment is expected to lead to a somewhat lower rate of wage increase both this year and next year than was assumed in December. The revised National Accounts figures indicate that productivity growth in the economy was higher than estimated during the greater part of the 1990s. Productivity also developed well last year. Given this, productivity is expected to show a slightly more rapid growth this year than was earlier forecast, which together with the slightly lower wage increases should give lower growth in unit labour costs in the corporate sector. This will contribute to slightly lower inflationary pressure during the forecast period. At the same time, it should be noted that total wage costs are expected to increase by just over 4.5 per cent this year, which is higher than the Swedish economy can manage in the long term.

■ ■ Electricity prices will greatly push up inflation in the short term.

At the end of last year electricity prices rose to record-high levels as a result of extremely low water levels in hydroelectric power companies' reservoirs. New information from the large electricity companies indicates that they have raised or are planning to raise electricity prices by just over SEK 0.20/kWh, which is expected to have a direct effect on inflation of just over one percentage point during 2003 Q1. Electricity prices are expected to gradually fall back during the spring and significantly subdue inflation (see the Box "The price of electricity and inflation").

The average UND1X inflation rate this year is expected to be 0.5 percentage points higher than was forecast in December, which is mainly explained by the higher electricity and oil prices. Disregarding the energy prices, UND1X inflation is expected to be on average a couple of tenths of a percentage point lower than was previously assessed, due to less strain on resources and lower labour costs. UND1X inflation is assessed in the main scenario to amount to only 0.8 per cent one year ahead. This low figure is mainly due to energy prices being expected to fall. Two years ahead, UND1X inflation is assessed at 1.8 per cent. The corresponding assessments for CPI inflation are 1 per cent one year ahead and 2 per cent two years ahead.

Table 1. Inflation forecast in the main scenario. Percentage 12-month change

	Annual rate			12-month rate			
	2002	2003	2004	Mar. 2003	Mar. 2004	Dec. 2004	Mar. 2005
CPI	2.4 (2.4)	2.5 (2.1)	1.5 (2.2)	2.9 (2.1)	1.0 (2.1)	1.9 (2.2)	2.0
UND1X	2.5 (2.5)	2.4 (1.9)	1.2 (1.9)	2.8 (1.9)	0.8 (1.8)	1.7 (1.9)	1.8
UNDINH	3.5 (3.5)	3.4 (2.9)	2.0 (2.7)	3.5 (2.7)	1.5 (2.7)	2.6 (2.7)	2.5
UNDIMPX	0.5 (0.5)	0.5 (0.0)	-0.3 (0.2)	1.2 (0.2)	-0.6 (0.0)	0.0 (0.1)	0.2

Note. The figures in brackets show the corresponding forecast in the previous Inflation Report. UND1X is CPI inflation excluding household interest costs for home-owners and direct effects of changes in taxes and subsidies. UNDINH refers to prices of mainly domestic goods in UND1X. UNDIMPX shows prices on mainly imported goods not included in UND1X.

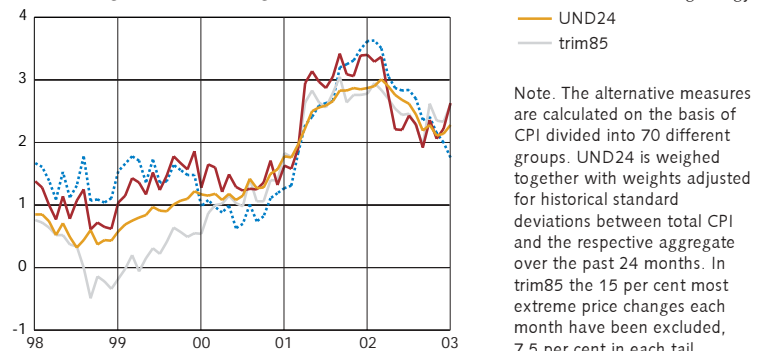
Sources: Statistics Sweden and the Riksbank.

Recent developments in inflation

During spring 2001 inflation began to rise, after being stable for a number of years. The Riksbank's assessment was that a large part of this increase was attributable to a number of easily identifiable supply shocks that had led, for instance, to higher energy and food prices. However, even disregarding higher energy and food prices the inflation rate rose, which is judged to be due to a weaker development in productivity and a relatively high level of resource utilisation. Lower increases in energy and food prices were important explanations for the subsequent sharp fall in inflation during spring 2002. On top of this came better growth in productivity and a lower level of resource utilisation. This picture is to some extent confirmed by the new, revised National Accounts figures that were published for 1993-2002 and which show that productivity developed more strongly than was indicated by the figures published earlier. However, developments in 2001 were still weak. The rate of increase in CPI fell from 2.9 per cent in January 2002 to 2.3 per cent in December 2002; the corresponding figures for UND1X are 3.4 per cent and 2.2 per cent.

Soaring energy prices at the end of 2002 meant that CPI and UND1X inflation rose to 2.8 per cent and 2.6 per cent respectively in January 2003 (see also the Box "The price of electricity and inflation"). During periods of severely fluctuating prices it may be interesting to study different measures of an underlying inflation rate adjusted for temporary and short-term shocks. However, underlying inflation has not been clearly defined and is accordingly measured in various ways. A relatively simple method is to exclude certain predetermined components from CPI inflation. UND1X excludes interest costs for homeowners and the direct effects of changes in indirect taxes and subsidies from CPI inflation. A further index of great relevance at present is UND1X excluding energy. Another method of measuring the underlying inflation rate is to use the aid of a statistical method to exclude or reduce the significance of groups of goods and services whose prices have been shown to vary considerably. Figure B1 shows UND1X including and excluding the energy component and two measures where particularly volatile components of CPI have been removed or their significance has declined. All measures show that the underlying inflation rate has fallen since last year, but that it is still at a higher level than it was 2-3 years ago.

Figure B1. Different measures of underlying inflation. Percentage 12-month change

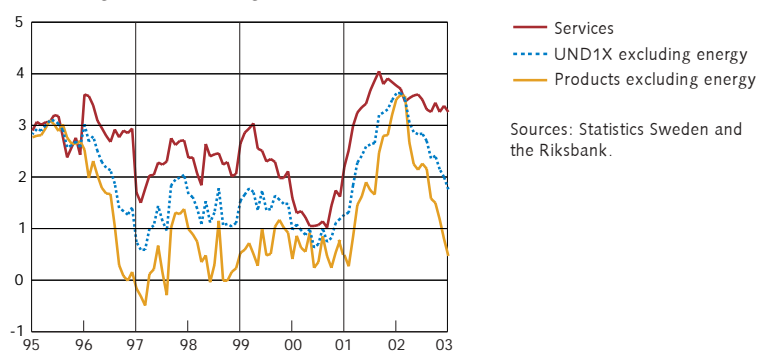


Note. The alternative measures are calculated on the basis of CPI divided into 70 different groups. UND24 is weighed together with weights adjusted for historical standard deviations between total CPI and the respective aggregate over the past 24 months. In trim85 the 15 per cent most extreme price changes each month have been excluded, 7.5 per cent in each tail.

Sources: Statistics Sweden and the Riksbank.

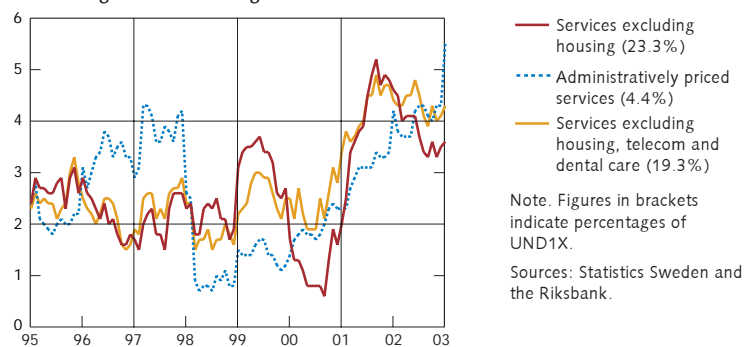
The rate of increase of UND1X excluding energy has been falling since spring 2002 and amounted to 1.8 per cent in January. However, price trends differ considerably between different goods and services sectors (see Figure B2). The rate of increase on goods prices has fallen since the middle of last year. Inflation in service prices has also fallen since last year, but is still at a high level. After several years of a rising rate of wage

Figure B2. UND1X excluding energy broken down into products and services. Percentage 12-month change



Sources: Statistics Sweden and the Riksbank.

Figure B3. Services prices. Percentage 12-month change



Note. Figures in brackets indicate percentages of UND1X.

Sources: Statistics Sweden and the Riksbank.

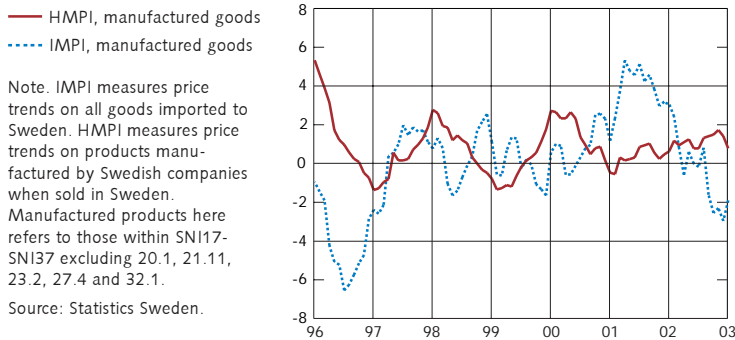
increase in the services sector, the trend was broken last year and the rate of wage increase fell back, which has probably subdued prices. The rate of price increase on the more administratively-priced services, such as various municipal taxes, is still rising, however (see Figure B3). This is probably a reflection of the more strained finances among municipalities during periods of economic slowdown when tax income grows at a slower rate.

Further indications of price pressure in the economy can be derived from price movements in earlier stages of production, for example producer prices (see Figure B4). However, there are also differences between the different aggregates here. The rate of

price increase on domestically-manufactured products for the domestic market has risen gradually since 2001, but is currently at a relatively low level. The picture for imported products is slightly different. The low rate of increase in international export prices, together with the stronger krona has led to a falling rate of price increase since autumn 2001.

To summarise, higher energy prices have meant that inflation has begun to rise. Moreover, inflation is for the same reason expected to rise further over the coming months and to reach around 3 per cent temporarily. According to the most recent surveys, both companies and households have revised their inflation expectations upwards slightly for one year ahead, which is probably also due to the widely publicised energy price increases. Disregarding the higher energy prices, however, underlying inflationary pressure has been subdued since the December report. Various measures of underlying inflation provide figures just on or below the inflation target of 2 per cent.

Figure B4. Manufactured products in the producer channel, domestic market prices and import prices.
Percentage 12-month change



The price of electricity and inflation

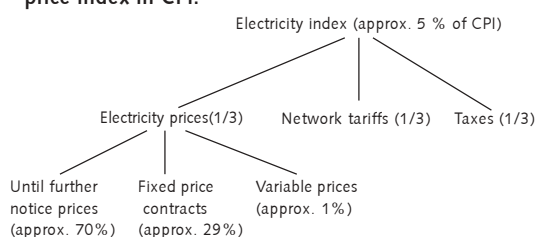
At the end of last year electricity prices on the Nordic electricity exchange rose to record-high levels around SEK 1/kWh, as compared with an average price of around SEK 0.14/kWh in recent years. One factor behind this price rise is the lower water supply in Sweden and Norway, which has required turning to another, more expensive form of electricity production than hydroelectric power. Colder weather than usual over the New Year period also contributed to pushing up prices. Electricity prices in the CPI rose by around 19 per cent on an annual rate in January, contributing 0.8 percentage points to the total inflation rate (see Figure B5). Another factor behind the price rise in the consumer channel is probably the fact that prices have been held down for a long period of time, following the deregulation of the electricity market in 1996.

Direct effect on consumer prices of higher electricity prices

An increase in electricity prices makes a direct impact on CPI via higher electricity prices for consumer (see Diagram B1). The assessment in the December report was that electricity prices for consumers would rise by an average of around SEK 0.05/kWh excluding taxes during the period November to March, which was expected to have a direct effect on CPI of approximately 0.3 percentage points. Information from the electricity companies shows that they have raised their prices by an average of around SEK 0.20/kWh, which implies a direct effect on CPI of approximately 1 percentage point. The electricity price increases are therefore expected to lead to CPI and UND1X being just over 0.7 (=1-0.3) percentage points higher during the first quarter than was assumed in December. After this, electricity prices for consumers are expected to gradually fall and contribute to a tangibly lower inflation rate during 2004. Electricity producers' improved trading margins since 2001, i.e. the difference between the electricity price on the Nordic exchange and the consumer price, are anticipated to lead to a reduction in prices to consumers as prices on the exchange begin to fall again later in the spring. This is also supported by the forward rates for electricity to be delivered during the summer, which indicate falling prices in future (see Figure B6). There is a clear connection between developments in electricity prices on Nord Pool and the water supply in the Nordic system (see Figure B7).

Apart from the increases in electricity prices, CPI and UND1X will be affected by the Bill put

Diagram B1. An overview of the electricity price index in CPI.



Note. The variable prices are attached to the Nord Pool electricity exchange. The difference between the variable price and fixed price agreements is that in the latter case the customer has made an active choice and signed for a fixed price over a specific period of time.

Source: Statistics Sweden.

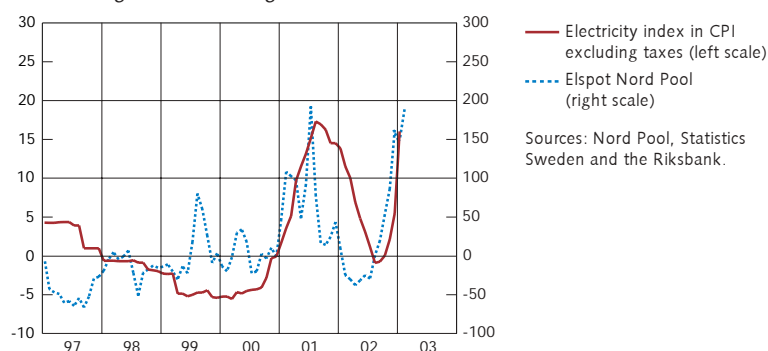
forward by the Government entailing with effect from 1 May that all electricity users and suppliers must purchase a certain percentage of electricity from renewable energy sources in relation to their electricity consumption. This Bill will lead to higher electricity costs for consumers and provide a further contribution to CPI and UND1X inflation of almost 0.1 of a percentage point with effect from May this year.

Indirect effects on consumer prices of higher electricity prices

Higher electricity prices can lead to contagion effects, where production costs rise for companies, particularly those with electricity-intensive production. Higher electricity prices should also lead to higher rents and higher transport costs.

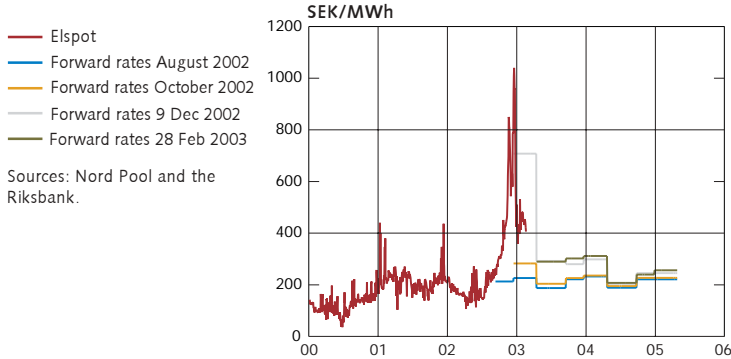
The high electricity price can also lead to an increase in inflation expectations. The National Institute of Economic Research's Consumer Survey indicates that households had made an upward revision in their inflation expectations in January, while their view of the real economy was less optimistic. There is a possibility that the rising electricity prices and the increase in electricity tax at the start of the year may affect wage demands in

Figure B5. The price of electricity at the producer and consumer levels.
Percentage 12-month change



Sources: Nord Pool, Statistics Sweden and the Riksbank.

Figure B6. Electricity spot prices and forward rates on Nord Pool.

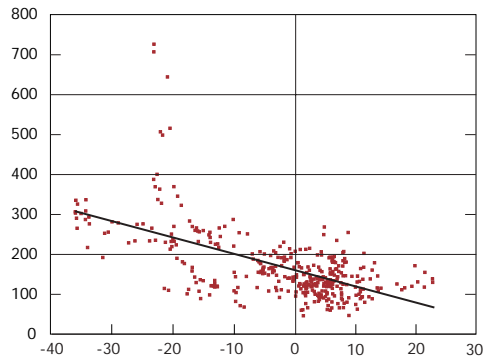


Sources: Nord Pool and the Riksbank.

the wage bargaining rounds in 2004. On the other hand, employers may be more restrictive with wage increases if their profits deteriorate or if the total demand in the economy declines. Given this and the fact that electricity prices are expected to fall back, the effects of wage formation and thereby inflation will probably be limited.

Simple estimations of the impact of a change in electricity prices show that approximately 5 per cent of a change in the producer price of electricity comes through in higher prices for other goods and services in the CPI within the course of a year.¹ However, prices move slowly and, given that the companies consider the electricity price rises to be temporary, they are expected to adjust their profit margins in the short term, rather than their prices. In the long term, however, profit margins must be restored and the cost increases affecting companies will be transferred to consumers. Indirect effects are expected to contribute around 0.1 of a percentage point to inflation during 2003.

Figure B7. Correlation between hydrological balance and electricity spot prices, weekly data 1996-2003 (week 8). SEK/MWh, TWh



Note. Hydrological balance refers to the water supply in the Nordic hydroelectric power system compared with the historical average. The correlation between the hydrological balance and the price of electricity is approximately 0.60.

Sources: Nord Pool and the Riksbank.

Table B1. Direct and indirect effects of UND1X (annual average). Percentage points

	2003	2004
Direct effect	0.6	-0.4
Indirect effect	0.1	0.0
Total	0.7	-0.4

Source: The Riksbank.

Real effects of higher electricity prices

Sweden is the fourth largest electricity user per inhabitant in the world, which is partly explained by the access to cheap hydroelectric power, the climate and natural resources, which have meant that manufacturing has specialised in energy-intensive products. The manufacturing sector accounts for 40 per cent of the total energy consumption. The cost of the electricity purchased comprised approximately 1.3 per cent of total costs in the manufacturing industry in 1996.² From a European perspective, Swedish industry has low electricity prices and exempt from tax, which has proved a competitive advantage (see Table B2). Assessing the size of the effects of electricity price increases on the real economy is complicated. The extent to which higher electricity prices lead to lower production and employment depends on the capital intensity of the companies, the energy costs' percentage of total production costs, the possibilities to transfer costs, substitution elasticity between energy and other intermediate goods and competitive conditions. In addition, there is an effect from lower demand for investment goods. The electricity-intensive products are relatively homogenous and price competition is stiff, which makes it difficult for companies to compensate for their higher electricity costs with higher product prices. The possibilities to transfer costs to an earlier production process may also be limited; this applies, for instance, in industries where prices of intermediate goods are set on the global market or to the mining industry, where there is no earlier process in the value chain.

Household consumption can also be affected by higher electricity prices. However, electricity price increases should be perceived by consumers as temporary and therefore have limited effect on total private consumption.

The price increases during 2003 will correspond to approximately 0.5 per cent of total private consumption. A simple calculation, where other consumption is assumed to fall by approximately ¼

1 Estimates of the impact of an electricity price change in the producer sector is based on econometric estimations, where development of UND1X excluding energy is explained by electricity prices in the producer sector, import prices and various measures of domestic demand. The results are similar when an error correction model and a VAR model are calculated.

2 This is the most recent data available, as Statistics Sweden's manufacturing statistics were reorganised in 1997 and later statistics are less detailed.

of this amount would entail a lower GDP growth of less than 0.1 of a percentage point in 2003.

Competition on the electricity market

After several years of electricity prices being held down, they began to rise in spring 2001 as a result of low water levels and thereby low hydroelectric power production in Norway. The electricity price index in CPI then rose at its highest to a 20 per cent annual rate. When electricity prices on the exchange fell back during summer 2001, prices for consumers continued to rise, which can be interpreted as a rebuilding of the electricity trading companies' profit margins. This made the Government appoint a commission to investigate competition in this market. The commission's conclusion was that price formation and competition functioned relatively well on today's electricity market.³ Price formation was assessed to have been largely governed by fundamentals, such as the water supply. The commission found that the trading companies' profit margins towards final customers had increased, but that they were not unreasonably high. At the same time, the commission pointed out that the high concentration on the electricity market could be a competition problem.

Facts on electricity trading

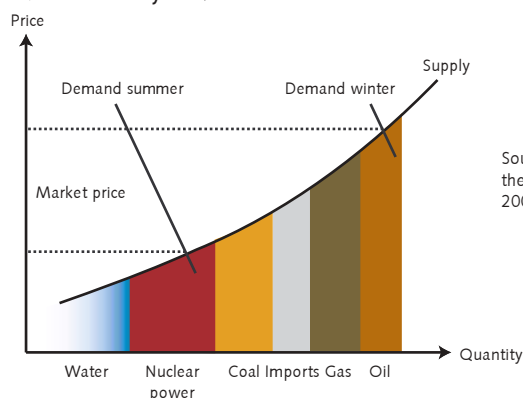
The Swedish electricity market was opened up to competition on 1 January 1996. At the same time, trade and production of electricity was separated from network operations, which is still a regulated monopoly. There are thus three different participants in the electricity market: *the network owner* who is responsible for the physical delivery of electricity, *the electricity producers* who produce electricity and put it into the network and finally *the electricity trading companies* who buy electricity from a producer or on the exchange and then sell it on to households.

The electricity markets in the other Nordic countries have also been opened up during the 1990s. Today, trade in electricity takes place on the joint Nordic electricity exchange Nord Pool and through bilateral contracts between electricity producers and electricity trading companies or directly to final customers.

Nord Pool consists of a spot market for physical delivery and a futures market, which is a purely financial market, where contracts are traded with a time horizon of up to four years. On

the futures market, companies can guarantee the price of electricity. The spot market contains two products, Elspot and Elbas. For *Elspot*, the system price is determined one day ahead, while *Elbas* is an adjustment market where trade can take place one hour before delivery time. The system price is a balanced price, based on bid rates and selling rates, i.e. an auction process. The price is set on the basis of production costs on the margin of the most expensive plant that must be started to meet demand (see Figure B8). If, for instance, a gas turbine power station, which has the highest variable production costs, must be operated, the power stations with lower costs will receive the same payment.

Figure B8. Principle price-setting model for the Nordic electricity market.



Source: Competition on the electricity market, SOU 2002:7.

There is a joint market, but capacity restrictions mean that there can be periodical differences in prices on this market.⁴ The difference between the area price and system prices constitutes the capacity price in each area. The traded volume in Nord Pool accounted for approximately 32 per cent of the overall electricity consumption in the Nordic countries in 2002, but the system price usually functions as reference for the other electricity trading.

The price of electricity in the slightly longer term

Price trends in the short term on Nord Pool are largely dependent on the water supply in Sweden and Norway. The available hydroelectric power determines how much more expensive combined power and heating and condensation power must be used. In the longer term, the price is determined by the energy balance, i.e. electricity consumption and supply of electricity. The electricity price to consumers is governed

³ Competition on the electricity market, SOU 2002:7.

⁴ The system price is set without taking into account transfer limits; if the price calculation meant that the power flow exceeded the available capacity, the area prices would be calculated instead.

by how prices develop on Nord Pool and by electricity companies' profit margins, taxes and network charges.

There are both supply and demand factors indicating that electricity prices can be expected to rise in the slightly longer term, compared with the price pressure following the deregulation of the electricity market. The earlier demand on the larger companies to maintain reserve power ceased to apply on deregulation in 1996. This means that the margins during consumption peaks have declined and the risk of an electricity shortage has the effect of pushing up prices. The low electricity prices have meant that no new capacity of any significance has been built up. The marginal production cost for, e.g. the new construction of a hydroelectric plant is estimated at around SEK 0.25/kWh, while the cost of land-based wind power is estimated at SEK 0.30-0.36/kWh.⁵ This can be compared with the average spot price on Nord Pool, which has been around SEK 0.14/kWh in recent years. While no sizeable new electricity production is starting up, electricity consumption is rising at the same rate as growth in the economy. Demand for electricity in the Nordic countries has risen by approximately 1.4 per cent a year during the 1990s. A large part of the increase in demand comes from the housing and services sectors.

During the spring the Riksdag is expected to take a decision on a possible closure of the nuclear reactor Barsebäck 2.⁶ Barsebäck 1 was closed in

November 1999. It is uncertain exactly what effect a closure of the reactor 2 would have on electricity prices. Today its production constitutes around 1 per cent of the Nordic electricity market.⁷ The two investigations ordered by the Ministry of Industry, Employment and Communications concluded that closure could lead to slightly higher prices, although they differed with regard to the size of the effect.⁸

The Council of the European Union has decided that Member States shall have opened up their electricity markets for non-household customers to competition by 1 July 2004 and the markets for all customers by 1 July 2007. There are currently large differences in the Member States' electricity prices and Sweden is one of the countries with the lowest prices for both households and industry. An integration of the European market could in the long term lead to an adjustment of price levels. For Sweden this could entail an upward adjustment of producer prices for electricity (see Table B2).

To summarise, electricity prices are expected to remain high in the coming months and to provide a positive average contribution to CPI and UND1X of around 1 percentage point during 2003 Q1. It can be concluded that even in the longer term, electricity prices can be expected to rise to higher levels than those prevailing in recent years, after the deregulation of the electricity market. However, it is uncertain whether prices will be sufficiently high to stimulate new power production.

Table B2. Electricity costs for industry and households including and excluding taxes on 1 July 2002. Euro/100 kWh

	Industry incl. tax	Industry excl. tax	Households incl. tax	Households excl. tax
Sweden	3.4	2.8	10.4	6.3
Finland	5.4	4.0	8.0	5.8
Norway	4.8	3.9	9.5	6.4
Spain, Madrid	5.9	4.9	9.6	7.9
France, Paris	6.4	5.6	11.5	8.9
United Kingdom	6.1	5.0	9.4	8.9
Greece, Athens	6.4	5.9	7.1	6.6
Luxembourg	4.9	4.4	11.9	10.5
Germany, west	7.0	5.7	14.2	10.4
Portugal, Lisbon	6.9	6.6	11.4	10.9
Belgium	8.4	6.9	13.1	10.7
Italy	10.9	8.1	19.0	13.7
Ireland, Dublin	8.3	7.4	9.4	8.3

Note. The price including tax includes VAT and other taxes. Industry in Sweden has no electricity taxes but VAT. Companies obliged to pay VAT in Sweden have the right to deduct VAT from the previous process. This means that the electricity price including tax overestimates the actual price industry pays. Data for industry cover companies with an annual consumption of 10 GWh, while data for households refers to an annual consumption of 7,500 kWh.

Sources: Eurostat and Statistics in Focus, Theme 8-16/2002.

- 5 Electricity Authority (2002), Electricity market 2002. These estimations include variable costs, capital costs and other fixed costs. The costs are exclusive of any subsidies. However, these figures should be used with caution and can vary.
- 6 The conditions for closure are that this would not have a significantly negative effect on the price of electricity, the access to electricity for the manufacturing industry, the effect balance and the environment and climate. In addition, the loss of power from this would be compensated by supply of new electricity and reduced electricity consumption. The government has examined this issue on two earlier occasions but found that all conditions were not fulfilled.
- 7 Electricity Authority (2002), Electricity market 2002.
- 8 Competition on the electricity market, SOU 2002:7.

The risk spectrum

It was assessed in the December Inflation Report that inflation was more likely to be lower than the forecast in the main scenario than higher.

The main indicator of lower inflation was the primarily negative signals from the financial markets. The assumption was that a continued adjustment of corporate and household balance sheets primarily in the United States could entail a stronger rise in saving. In addition, the fall in share prices could be followed by a decline in property prices, which could in turn have a further subduing effect on demand in the global economy. In this situation there could be a possibility that households' and companies' expectations of their financial situation could be more pessimistic and accentuate an economic downturn.

There were also factors indicating higher inflation than assumed in the main scenario. These included fears of contagion effects from the early cancellation of the Municipal Workers' Union's wage agreement to other collective agreement areas. However, the upside risks were not judged to fully outweigh the downside risks and the conclusion was that inflation, taking into account the risk spectrum, could be a tenth of a percentage point lower than the rate in the main scenario.

Since the December Inflation Report, real economy prospects in the rest of the world have deteriorated somewhat, although it is developments in Europe rather than those in the United States and other parts of the world that have proved to be weaker than expected. The upswing in economic activity in Sweden also appears to be rather slower than had been assumed, which indicates lower pressure from prices and wages. The fact that the forecast for inflation in 2003 was nevertheless revised upwards is a result of the rising energy prices. In addition to the risks normally taken into account when assessing inflation – such as upside and downside risks in assessing resource utilisation in Sweden and abroad and cost pressure – we now have developments in energy prices and exceptional risks connected with the geopolitical situation.

The main scenario is based on the assumption that the negative macroeconomic consequences of the Iraq crisis will be limited. However, the threat of a military attack on Iraq creates uncertainty that affects future expectations in many ways all over the world. In the present situation it is more difficult than usual to correctly interpret economic signals and even to assess which risks are the most serious. The geopolitical situation is creating genuine uncertainty that is difficult to take into account in the risk spectrums normally drawn up by the Riksbank. Nevertheless, it is necessary to try to outline a risk spectrum and to quantify the risk that inflation will be higher or lower than in the main scenario.

■ ■ Domestic upside risk.

The effects on inflation from a different development in costs are relatively easy to predict. It is assumed in the main scenario that the energy price rises are primarily of a temporary nature, but there is a risk that the electricity companies, whose price margins have been under pressure, will not adjust their prices as far downwards as expected, but will instead improve their profit margins. There is also uncertainty with

regard to the indirect effects of the energy price increases. Electricity and oil prices affect companies' costs and can therefore lead to higher cost pressure in the economy. This applies in particular to electricity-intensive production, but also to rents and prices for transportation. Although this is taken into account in the main scenario, there is a risk that the contagion effects have been underestimated (see also the Box "The price of electricity and inflation").

With regard to wage formation, the relatively weak demand situation is at present assessed to have a subduing effect on wage demands. The collective wage bargaining rounds for 2004 will begin in autumn this year and agreements will be signed covering 2 million employees. There is a risk that the cancellation of the Municipal Workers' Union's agreement will result in compensation demands from other trade unions. In addition, inflation is at a high level, which could also provoke high wage demands. There is also uncertainty over the development of the labour supply, partly due to difficulties in assessing future developments in absence due to sickness and average working hours. A lower labour supply would lead to higher cost pressure and thereby higher inflation. Although it is easiest to identify domestic factors that may lead to higher inflation than in the main scenario, there are also downside risks for inflation. One is a weaker development in consumption. This could result from a tightening of public finances more than anticipated in order to attain budget targets. Domestic demand could also be negatively affected if a weaker budgetary development were not managed according to the rules and confidence in economic policy was thereby shaken. All in all, however, the risks connected with electricity prices, wage formation and labour supply dominate and constitute an upside risk for inflation.

■ ■ International downside risk.

Uncertainty over the development of the global economy arises not only from the geopolitical situation, but also from worrying signals regarding economic activity in the euro area, particularly Germany and France, as well as the difficulty of estimating how far the adjustment of corporate balance sheets and household savings has come in the United States and Europe. Weaker growth in the euro area constitutes the main downside risk for Swedish inflation. The forecast for growth in the euro area has been revised downwards slightly in the main scenario. However, there is uncertainty with regard to how profound and prolonged the economic downturn will be. During the most recent economic slowdown, European companies have largely chosen to retain personnel, despite declining demand, which has led to cost problems. This, together with increased uncertainty over the future, could lead to a delay in the upswing in investment. The declining optimism among consumers in the euro area and the weak growth in consumption over the past six months also raise doubts regarding future consumption propensity among households and to what extent higher real disposable incomes will be spent on consumption. Moreover, there is a need in several countries to tighten up fiscal policy in order to deal with overly large deficits in public finances. Weaker demand in the euro area could lead to lower international export prices,

while market growth for Swedish exports was curbed. This, together with negative demand effects in the Swedish economy from higher taxes and lower optimism among households regarding their own finances, could result in lower domestic demand and inflation.

However, the international economic picture is not entirely unambiguous. Rapidly declining uncertainty, with a following upswing in stock market prices and confidence among companies and households could, in the prevailing situation of expansionary economic policy and liquid investors, lead to a more rapid recovery in the global economy and Sweden. This could entail a higher inflation rate.

■ ■ War risks.

Uncertainty over the consequences of a potential war in Iraq and the possibility of achieving stabilisation in the region affect all assessments of the global economy now being made. The main scenario is based on an assumption that there will either be a peaceful solution or a brief war with only slight macroeconomic consequences. However, there is also a risk of a war that would have serious repercussions on the economy. There are fears that if production capacity in Iraq is wiped out, it could give rise to much higher oil prices than anticipated in the main scenario. In this scenario, the adaptation to lower prices would probably be at a slower rate. Unease in the Middle East could also result in higher freight costs and higher international export prices. This, together with the uncertainty, could have a negative effect on global trade, investment, share prices and consumer confidence. In the long run, the consequence would be lower growth both internationally and in Sweden. The longer the crisis is prolonged, the greater the risk of tangibly negative effects on the development of the real economy. (See the Box "The economic consequences of a military conflict in Iraq"). However, it is very difficult to assess the consequences for inflation. On the one hand, a war could be described as a supply shock, resulting in lower capacity for civilian production and higher prices. On the other hand, private demand would also decline, partly due to reduced income and partly due to uncertainty and less confidence in the future, which tends to subdue price pressure.

The total risk assessment is that the risks for Swedish inflation are balanced. The Riksbank's assessment is shown in Figure 5, which shows the uncertainty surrounding the forecast of UND1X inflation. The forecast for CPI inflation also shows – for the same reasons – a balance of risks, see Figure 6.

The uncertainty in the assessment of future inflation is judged to be slightly higher than normal, but roughly the same as in the December report.

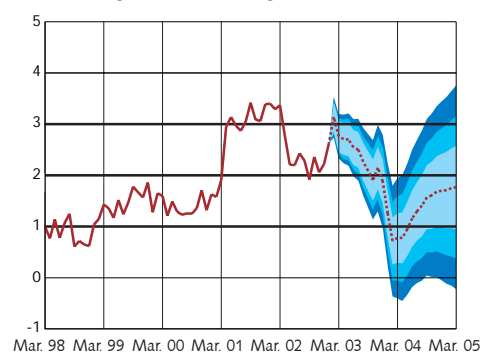
Table 2. Inflation forecasts including the risk spectrum.
Percentage change

	Annual average		12-month rate		
	2003	2004	Mar. 2004	Dec. 2004	Mar. 2005
CPI	2.5 (2.1)	1.5 (2.1)	1.0 (2.1)	1.9 (2.1)	2.0
UND1X	2.4 (1.9)	1.2 (1.8)	0.8 (1.7)	1.7 (1.8)	1.8

Note. The table gives the mean values of the inflation assessment's probability distribution (see Figures 5 and 6). The figures in brackets are the corresponding values in the December report.

Source: The Riksbank.

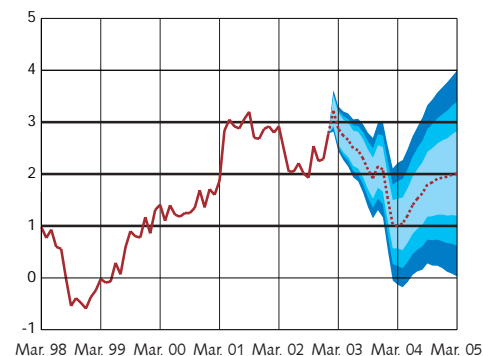
Figure 5. UND1X inflation with uncertainty intervals.
Percentage 12-month change



Note. The uncertainty intervals show the 50, 70 and 90 per cent chances of UND1X inflation being within the respective range. The broken line represents the main scenario's forecast. The horizontal lines at 1, 2 and 3 per cent are the Riksbank's inflation target and the tolerance interval for the annual change in the CPI.

Sources: Statistics Sweden and the Riksbank.

Figure 6. CPI inflation with uncertainty intervals.
Percentage 12-month change



Note. The uncertainty intervals show the 50, 70 and 90 per cent chances of CPI inflation being within the respective range. The broken line represents the main scenario's forecast. The horizontal lines at 1, 2 and 3 per cent are the Riksbank's inflation target and the tolerance interval for the annual change in the CPI.

Sources: Statistics Sweden and the Riksbank.

**Table 3. UND1X inflation (12-month rate).
Percentage probability for different outcomes**

	UND1X<1	1≤UND1X<2	2≤UND1X≤3	UND1X>3	Total
Mar. 2004	62 (10)	34 (43)	4 (40)	0 (7)	100
Mar. 2005	26 (26)	31 (31)	27 (28)	16 (15)	100

Note. The figures show the probability of UND1X inflation being in the column's interval. The figures in brackets show the corresponding forecast in the previous Inflation Report.

Source: The Riksbank.

**Table 4. CPI inflation (12-month rate).
Percentage probability for different outcomes**

	CPI<1	1≤CPI<2	2≤CPI≤3	CPI>3	Total
Mar. 2004	47 (4)	44 (33)	9 (49)	0 (14)	100
Mar. 2005	20 (18)	29 (28)	30 (31)	21 (23)	100

Note. The figures show the probability of CPI inflation being in the column's interval. The figures in brackets show the corresponding forecast in the previous Inflation Report.

Source: The Riksbank.

Outlook beyond the forecast horizon

Monetary policy is primarily governed by inflation prospects one to two years ahead. However, some importance with regard to monetary policy should also be attached to developments in the shorter and longer run. Developments in inflation over the coming six months will be dominated by energy prices. Inflation is expected to rise slightly further to begin with, as a result of the electricity price increases, but to gradually fall back later in the spring. Inflation forecasts beyond the usual horizon, that is to say more than two years ahead, are for natural reasons more uncertain. The considerable uncertainty already prevailing, mainly due to the geopolitical situation, can lead to the question of whether it is really worth discussing what might happen more than two years ahead. On the other hand, the present exceptional situation entails a need to look ahead beyond the most current problems, to gain a picture of the more long-term development trends in the economy.

The main scenario outlined here assumes that the recovery will be relatively modest during the forecast period and that there are unutilised resources in the economy. Apart from the supply shocks affecting inflation, inflationary pressure is expected to be limited during the entire period. The forecasted GDP growth for 2004 and 2005 is roughly at the same level or slightly above what is currently regarded as potential growth for the Swedish economy. This means that resource utilisation will remain largely unchanged. In a normal economic cycle, growth during an upturn phase usually exceeds the long-term sustainable level, sometimes for several years in a row. This indicates that Swedish GDP growth could increase at a more rapid rate during 2006 and 2007 and thereby cause rising inflationary pressure.

However, the longer-term assessments of GDP growth and inflationary pressure must be supported by estimations of long-term growth in the economy's production capacity, what is known as potential growth. Such estimations are uncertain and tend to vary over time. This is partly due to the fact that the determinants of potential growth change, such as the rate of technological development, demographic conditions, tax regulations and other incentives for companies and households.

However, the estimations of potential growth also vary as a result of changes in interpretations of historical experiences, e.g. in connection with revisions in statistics. With regard to Sweden, the revised National Accounts figures indicate that actual production was slightly higher than was previously calculated. As the historical picture of inflationary pressure has not changed, this would in turn indicate that potential production has also grown slightly more rapidly than was earlier assumed. It is therefore possible that during a few years after 2005 growth could be higher without inflationary pressure becoming problematic.

The economy's potential growth rate is also determined by the labour supply. The latter is partly dependent on technological developments, as they affect productivity and real wages, but labour supply also depends on demographic developments, the tax system, the social insurance system and many other factors. Historical experiences in Sweden and other countries indicate that technological developments can contribute around two percentage points to growth. The forecasts of demographic developments now being made indicate that this could contribute to an increase in the number of hours worked by around 0.3-0.4 percentage points a year during 2005-2008. Reductions in absence due to sickness and early retirement could stimulate potential growth, at least temporarily. In the longer term, demographic developments appear less favourable, which will probably lead to a need for changes in taxes and social insurance that increase the labour supply. It is important in this context that the necessary economic policy measures are taken to actually achieve a reduction in absence due to sickness.

Growth in the Swedish economy also depends on growth in the rest of the world. Many assessments now indicate a higher potential growth rate in the United States (around 3 per cent a year) than in the euro area (around 2 per cent). According to current forecasts, GDP growth in the United States will remain at or slightly above the long-term potential growth level in 2004 and 2005, which is compatible with the present relatively low level of capacity utilisation in the United States. The forecasts for the euro area indicate that resource utilisation will be low during 2004 and 2005. All in all, this implies that both the United States and the euro area could find themselves in a continued upturn phase with higher growth figures in 2006 and 2007, but this type of assessment is very uncertain. There is also considerable uncertainty with regard to the outcome of the crisis in Iraq and there are several possible scenarios that could lead to a much worse development than that outlined as most probable in the main scenario. Although there are good reasons to believe that the remaining effects on the global economy of a possible war would be slight in 2005 and onwards, there is still a risk of negative consequences as counterbalance to the reasons for optimism. A large-scale reduction in oil capacity combined with new acts of terrorism could lead to a long period of high oil prices, subdued global trade and low economic growth.

All in all, there is nevertheless good reason to expect a rise in GDP growth in Sweden in 2006 and 2007. However, this type of development

requires that average working hours begin to rise once again and that the functioning of the labour market is improved in general.

Inflation is not determined merely by the development of actual and potential production; it is also influenced by how monetary policy reacts to the observed and expected inflation rates. The Riksbank's forecasts of GDP growth, inflation, etc. in the normal forecast horizon are based for pedagogical reasons on the assumption of an unchanged repo rate. The idea is that these forecasts will indicate whether or not there is a need to change the repo rate. Forecasts of inflation in a longer term than two years are complicated by the fact that the assumption of an unchanged repo rate appears increasingly unrealistic and unreasonable the further ahead the forecast horizon extends. In the present situation there is the additional problem that a potential full participation in Stage Three of EMU by Sweden from 2006 would affect monetary policy and inflation both before and beyond the forecast horizon. However, there is no reason to believe that if this occurs, it would have any drastic consequences with regard to the direction of monetary policy and thus for inflation during the years immediately beyond the forecast horizon. In relation to the uncertainty always inherent in inflation forecasting, the differences in monetary policy and inflation between Sweden and the euro countries are slight.

The economic consequences of a military conflict in Iraq

During the winter, the global geopolitical situation has been characterised by uncertainty over the Iraq issue. The main scenario of the Inflation Report assumes that the economic consequences of the Iraq crisis will be limited, either through a peaceful solution or by a possible war scenario having relatively minor economic consequences. A war is regarded by security policy analysts as the most probable scenario.

The risk of war has also been reflected in the financial markets and in oil prices. Stock markets have shown considerable volatility and falling prices, after a temporary stabilisation in late autumn 2002. Oil prices have risen to higher levels, partly because of the strained stocks situation in the United States and the loss of oil production in Venezuela due to strikes. All in all, this has hampered growth in the global economy roughly as outlined in the special study "Economic effects of the uncertain geopolitical situation" in the October 2002 Inflation Report.

There are several possible scenarios for how a war might develop and the uncertainty is considerable. This Box outlines a number of possible scenarios for global economic development under different assumptions. Two scenarios with a more problematic course of events than the main scenario have been studied and an attempt has been made to quantify the effects on the Swedish economy in the different cases.

Studies of conflicts and outright wars during the post-war period show that the costs of war are often underestimated.¹ At the same time, it should be remembered that the macroeconomic repercussions for the global economy of unforeseen events during the 1990s, such as the Gulf War, the Asian crisis, the Russia crisis and acts of terrorism in the United States were nevertheless fairly limited.

Economic consequences

There are a number of different channels by which a war in Iraq can affect production, employment and inflation even in countries not directly involved in the war. An increase in oil prices as a result of a reduction in production capacity would have a direct effect on inflation. In addition, a rise in oil prices could give rise to contagion effects in that production costs would rise (see also Box on "The price of electricity and inflation"). The higher oil prices lead to lower production and lower consumption in the global economy.

The actual uncertainty over the outcome of the war and what will follow also affect economic growth. This has already been illustrated on the financial markets during the autumn and winter. Economic policy, via monetary policy and fiscal policy, can partly counteract the negative economic effects of a war, but obviously it cannot completely eliminate them.

This means that descriptions of the economic consequences of various courses for a war must be based on explicit assumptions of several different mechanisms, e.g. the effects on oil prices, stock markets and economic policy. To some extent, these assumptions are of course arbitrary. Nevertheless, some form of assumption regarding the development of the Iraq crisis lies behind all economic forecasts presently being made. The Riksbank has therefore chosen to present some relatively clear illustrative calculations.

Scenarios for a military conflict in Iraq

The base for the Riksbank's analysis is obtained from both Swedish and international security policy experts and their assessments of the possible course for a conflict. Descriptions of the course of events are divided into two phases, the war phase and the rebuilding phase. The outcome of the former to some extent determines the conditions for the latter. The assumptions for the various scenarios are shown in Table B3 below.

The economic effects of a less difficult ('benign') war scenario are expected to be largely the same as those described in the main scenario of the Inflation Report, i.e. that oil prices fall back and that the uncertainty currently prevailing on the financial markets gradually declines.

An **intermediate** scenario would entail a more drawn-out, problematic process of rebuilding. This would entail, for instance, a greater reduction in oil production capacity than in the benign scenario.

Finally, the really **worst case** scenario cannot be ruled out, where the Iraq conflict spreads to other countries in the region or other parts of the world, for instance through civil war and acts of terrorism. However, the probability of this is assessed as lower than that of the other two scenarios described in Table B3.

To illustrate how the economy could be affected by a more troublesome outcome to the conflict, some simulations have been made using the international model NIGEM (see Table B4). The first alternative scenario (**intermediate**) entails oil prices rising as a result of a reduction in oil capacity corresponding to Iraq's total production,

Table B3. Various war scenarios.

Phase	Scenario		
	Benign (Oil and share prices as in main scenario)	Intermediate (Oil USD 35/barrel, fall in share prices 10 per cent)	Worst case (Oil USD 45/barrel, fall in share prices 20 per cent)
War	Rapid course of events, 6-7 weeks No reduction in oil capacity OPEC covers loss of oil deliveries from Iraq	More prolonged course (1-2 quarters) Some spread of the conflict Some loss of oil capacity in Iraq or neighbouring country OPEC unable to fully cover loss of oil deliveries	Prolonged war (>2 quarters) Spread of conflict in the region or to other parts of the world Reduction of oil capacity in Iraq and a neighbouring country Severe shortage in oil deliveries
Rebuilding	Rapidly appointed regime based on existing social structure Iraqi oil production finances rebuilding	Difficult to obtain support for new regime, some unease in the region Higher degree of direct financing for rebuilding	Unstable new regime appointed Unease in the region/other trouble spots/ acts of terrorism in west Financing of rebuilding falls to countries involved in war

so that under the entire forecast period the price is higher than in the main scenario (see Figure B9).⁹ In addition, it is assumed that the uncertainty in the financial markets will persevere and that share prices will fall by a further 10 per cent this year compared with the main scenario. The other scenario (**worst case**) assumes that oil prices will rise to an average of USD 45/barrel during the entire forecast period and that share prices will fall by 20 per cent. The central banks are not expected to react to the rising inflation from higher oil prices by raising interest rates. On the other hand, if interest rates were lowered in the United States and Europe, the effects on growth could be mitigated somewhat, while inflation would rise. Prices in Europe are somewhat more slow-moving, which means that an interest rate cut would in the short term have greater effects on growth than on prices, while the opposite situation applies in the United States. However, this line of thought is based on inflation expectations not being tangibly affected. The psychological effects that can be expected to have a negative effect on consumption and investment are not included in any of the scenarios.

According to the **intermediate** scenario, growth in the euro area would be around one half of a percentage point lower than in the main scenario, in total during 2003 and 2004. The corresponding effect for the United States would be slightly larger, a total of 1 percentage point, primarily due to greater dependence on oil. The global market for Swedish exports would decline by just over 1 percentage point, compared with the main scenario, as a result of this. With regard

to price trends, the sharp upturn in oil prices means that consumer prices in the EMU would be approximately 1 percentage point higher during the forecast period, while the increase in the United States would amount to 0.3 per cent. The reasons for lower inflation in the United States are that demand would be lower than in the EU area and that wages would adapt more quickly to this. These results coincide well with other, similar simulations.^{9 10}

In the **worst case** scenario, the effects on both growth and inflation would of course be greater. However, in the United States the lower growth would lead to the inflationary effect being slightly less than in the intermediate scenario, thanks to a more rapid adaptation of demand here than in Europe. All in all, the effect on Swedish export market growth in this scenario would be twice as great as in the intermediate scenario.

Conclusion

Almost all recessions over the past three decades have occurred directly or indirectly in connection with unease on the oil market, terrorism or war. Both oil price shocks in the 1970s led to severe recessions and the Gulf War's sharp rise in oil prices contributed to the recession at the beginning of the 1990s. At the same time, there are major differences between now and then. Compared with the two crises in the 1970s, the dependence on oil has declined. Inflation is currently at a low level and inflation expectations do not indicate it is about to rise in the longer term. There is much greater confidence now in the central banks' capacity to keep inflation down than during previous oil price shocks. In addition,

⁹ W.D. Nordhaus, "The economic consequences of a war with Iraq", NBER Working Paper No 9361, 2002.

¹⁰ These assumptions are largely based on the scenarios described in the report "After an Attack on Iraq: The Economic Consequences", a conference document from the Center for Strategic and International Studies in Washington (CSIS).

Table B4. Growth and inflation: The difference in rate of increase compared with the main scenario. Per cent

Total effect on GDP and trade 2004	EMU	United States	OECD	Swedish export market
Intermediate	-0.6	-1.0	-0.6	-1.2
Worst case	-1.0	-2.0	-1.3	-2.3

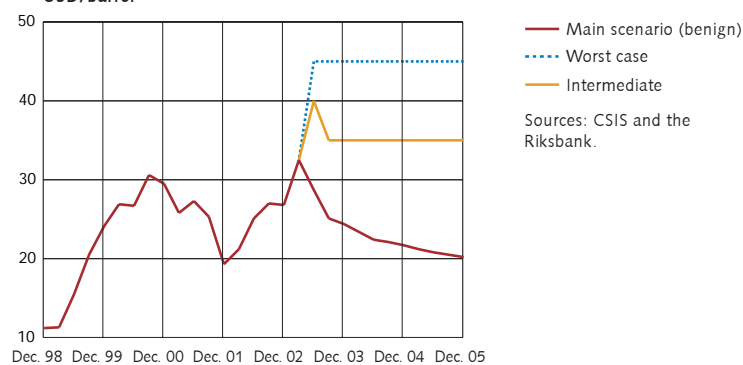
Total effect on price level 2004	EMU HICP	United States CPI	OECD private consumption deflator	Sweden HICP	International export prices
Intermediate	0.9	0.3	0.6	0.7	1.5
Worst case	1.5	0.3	0.9	1.1	2.4

Note. HICP is the EU harmonized index of consumer prices.

public finances in most countries are stronger now than they were, for instance, in the early 1990s. There has been scope to conduct an expansionary economic policy to counteract a number of the negative effects on the economy that have already arisen. At the same time, public finances in both the United States and large parts of the euro area have rapidly deteriorated recently, which has increased the probability of an unfavourable economic development.

The main scenario of the Inflation Report is based on the assumption that the conflict will have a peaceful solution, or if there is a war it will have limited economic consequences, similar to those ensuing from a peaceful solution. If the conflict were to be longer drawn-out and more problematic, it could have serious consequences for future economic developments.

Figure B9. Oil price developments in the various scenarios. USD/barrel



■ Determinants of inflation

This chapter presents the assessments in the main scenario of inflation's principal determinants in the coming two years. It begins with an account of developments in the financial markets. This is followed by an analysis of the international situation and economic developments in Sweden.

The financial markets

Since the December Inflation Report, the financial markets have been largely characterised by continued uncertainty, partly connected with the geopolitical situation. This uncertainty has been expressed in terms of lower share prices, flight to quality investments such as gold and treasuries, and a weaker US dollar (see Figures 7 and 8). Pricing on the financial markets reflects expectations that the geopolitical situation will lead to continued high oil prices and a cautious investment climate. Counteracting this is a general fall in interest rates, the fact that credit risk premiums remain in principle unchanged, and improved company earnings.

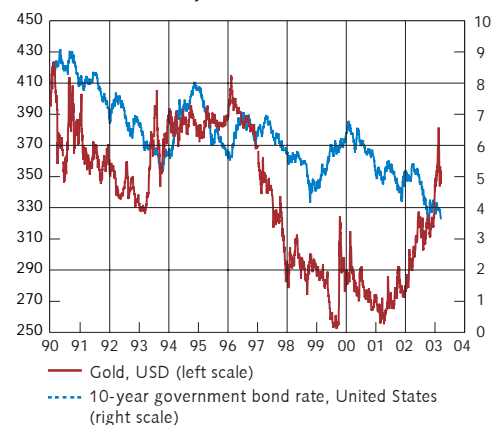
■ ■ General weakening of the dollar.

The US dollar has continued to weaken since the December Inflation Report, by approximately 8 per cent in TCW terms and by approximately 9 per cent against the euro. This is probably due to the geopolitical unease and the high oil prices, as the US economy is considered to have greater relative dependence on oil than the rest of the world.

The weaker dollar should also be regarded in the light of the dollar having been considered as fundamentally over-valued recently, partly because of an increasing deficit on the US current account. Since the mid-1990s the US economy has shown higher productivity growth than the rest of the world. However, expectations regarding the growth prospects for the US economy have lately been called into question, partly because of growing budget deficits, lengthy problems in the IT sector and a number of sensational corporate scandals. Questions have also been raised as to how the geopolitical situation will affect US growth. Given this, capital inflows in the form of portfolio and direct investment have declined and the dollar has weakened since the start of 2002. However, the recent dollar depreciation occurred more rapidly than expected. As large deficits in the US economy are expected to affect the dollar during the entire forecast period, the forecast for the USD/EUR rate is being revised down for the period as a whole.

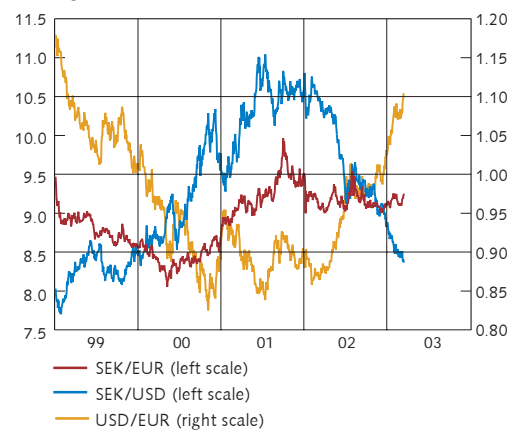
The krona has appreciated marginally on the TCW index since the December report (see Figure 8). The appreciation is less than was expected then, which is connected with a depreciation against the euro. This is assumed to be partly due to the general unease on the financial markets, although the outflow of pension money to foreign funds has probably had some significance. It is nevertheless worth noting that the krona has been relatively stable during a period of financial unease; experience usually shows that the krona weakens during such periods. Fundamentals such as relative growth prospects and the surplus on the current account still indicate - independent of a possible membership of

Figure 7. 10-year government bond rates in the United States and the price of gold.
Per cent, USD/troy oz



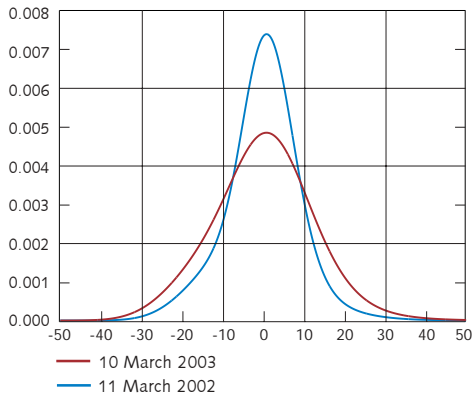
Source: The Riksbank.

Figure 8. SEK/USD, SEK/EUR and EUR/USD.



Source: The Riksbank.

Figure 9. Probability distribution for OMX options on two different dates.¹²



Sources: Citibank and the Riksbank.

ERM2 - that the real krona exchange rate will strengthen during the forecast period. Given the present geopolitical situation and high level of uncertainty, however, the strengthening of the krona against the euro is expected to be at a somewhat slower rate during 2003 than was forecast earlier. During 2003, 2004 and 2005 the TCW index is expected to average 129.1, 124.5 and 123.7 respectively.

■ ■ High level of uncertainty continues to hold back stock market.

The European stock markets have fallen between 15 and 30 per cent since the December Inflation Report. The US stock markets have fallen slightly less. These falls in stock prices have taken place despite companies reporting continued improvements in profits during 2002 Q4. The reported improvements in profit appear to primarily arise from rationalisation and a more favourable debt situation, rather than increased sales.

A gradual strengthening of economic activity, continued low interest rates and a P/E ratio assessment largely in line with the historical average indicate that the right conditions exist for a tentative stock market upswing in coming years. However, the question marks surrounding economic activity and geopolitical unease are expected to have a restraining effect on corporate earnings growth and contribute to a more subdued stock market development than was earlier assumed. Pricing on the options market shows that uncertainty is still considerable (see Figure 9). Following the sharp stock market decline in recent years, the stock market has been characterised by an underlying uncertainty regarding possibilities for long-term profit-making and expected yield and what proportion of shares investors should have in their portfolios.¹¹ However, the main scenario entails a P/E ratio valuation at the current level for the remainder of the forecast period.

■ ■ Downward revision in interest rate forecast.

The geopolitical situation, continued debt adjustment following the share price bubble and deteriorated economic prospects have contributed to a fall in international bond rates since the December report. The decline in 10-year government bond rates has been greater in the euro area than in the United States, which is partly due to expectations of further interest rate reductions by the ECB and the fact that the supply of government bonds in the United States is expected to increase.

Swedish bond rates have largely followed developments in the euro area. The long-term interest rate differential with Germany of approximately 0.5 percentage points remains, despite rising short-term inflation expectations in Sweden.

The interest rates on corporate bonds with a good credit rating have also fallen considerably since the December report. This is because investors at present prefer interest-bearing investments and the expected return on

¹¹ This uncertainty is also connected to how profits are reported and to what extent underfinanced pension obligations will affect future profits.

¹² The implied probability distribution shows the market participants' risk-neutral estimate of the probability for a yield on the OMX index in approximately one month. The distribution as of 24 April 2002 is used as a reference to illustrate a period when expected volatility was low.

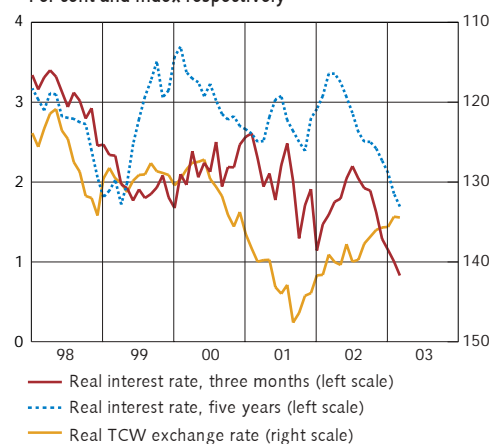
government bonds is regarded as low. The generally low interest rates have also encouraged Swedish households to increase their borrowing with mortgage institutions, which is reflected in the continued relatively high activity on the markets for single-family dwellings and tenant-owned apartments. However, it is assumed that the stimulating effect of lower interest rates on house prices will subside as interest rates are expected to rise in the light of an expected economic upswing in Sweden and abroad. All in all, the average 10-year bond rate is expected to be 4.7, 5.1 and 5.5 per cent respectively in 2003, 2004 and 2005, which is a downward revision of approximately 0.5 percentage points during the forecast period.

Recent developments indicate that financial conditions have become slightly more expansionary in the sense that real short-term and long-term interest rates have fallen (see Figure 10). In a broader financial perspective, the expansionary forces will at least partly be offset by lower share prices and a slightly stronger real exchange rate. Financial conditions are expected to tighten up somewhat going forward as long-term rates rise and the krona appreciates.

The annual growth rate of M0 money supply has continued to decline and amounted to -0.1 per cent in December. The rate of increase in the broader M3 rose during the same period to 4.3 per cent on an annual basis. This increase is primarily due to an increase in households' bank deposits, but also to companies increasing their bank deposits. The relatively strong development in households' bank deposits is probably a result of portfolio changeovers from shares to saving in banks.

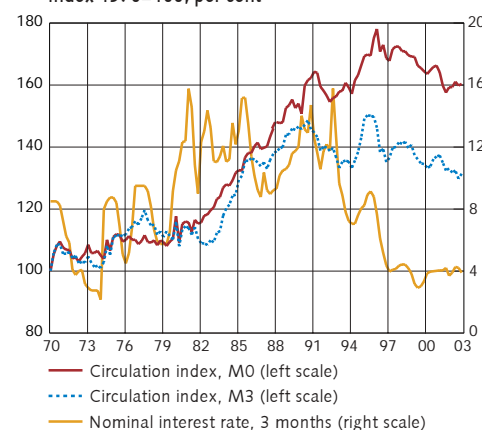
The development in the money supply aggregate should be interpreted with great caution. The connection between money supply and GDP developments in a longer-term perspective has varied according to, for instance, new market conditions. Deregulations on capital markets, financial innovations and a high inflation rate during certain periods are examples of factors contributing to the fact that there is no stable relationship between growth in the economy and the development of the money supply aggregate (see Figure 11).

Figure 10. Real interest rate with five-year and 3-month duration respectively and real TCW-weighted exchange rate. Per cent and index respectively



Source: The Riksbank.

Figure 11. Rate of circulation for M0 and M3 respectively expressed in index form and nominal short-term rate. Index 1970=100, per cent

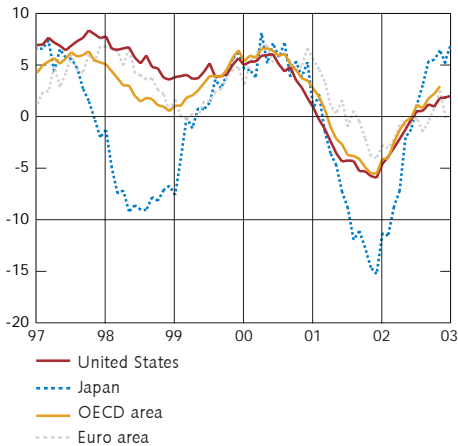


Note. The rate of circulation, V , is defined as the relationship between $MV=PY$, where Y measures the volume of transactions in the economy (e.g. real GDP), P is a measure of price levels (e.g. CPI) and M is a money supply measure. The circulation index is based on seasonally-adjusted quarterly data for the money supply, GDP and CPI.

Source: The Riksbank.

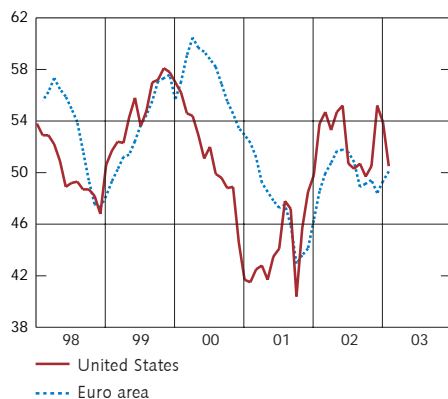
External economic activity and inflation

Figure 12. OECD area manufacturing output. Percentage 12-month change



Sources: Eurostat, Ministry of International Trade and Industry, OECD and US Federal Reserve.

Figure 13. United States and euro area: purchasing managers index. Index



Sources: ISM and NTC Research Ltd.

■ ■ Recovery despite weaker growth.

International developments have continued to be marked by an adjustment of corporate and household balance sheets as well as by the uncertainty surrounding geopolitical security. Global economic growth recovered slightly during 2002, but the revival lost pace during the second half of the year. Household consumption in the United States has withstood the slowdown and dampening effects previously felt from investment demand have also alleviated, thus contributing to a stabilisation of both manufacturing output and confidence indicators (Figs. 12 and 13). Prospects are favourable for a continued recovery in the United States, due to growing investment demand in the corporate sector, a stimulatory economic policy and at least partially adjusted balance sheets. In Europe debt adjustment has not advanced as far, which, together with structural problems and tighter fiscal policy, has led to a slight downward revision of the forecast. Private consumption is expected to rise during the forecast period, partly due to a stabilisation of labour markets in both the United States and Europe and moderate inflationary pressure. Most indicators currently suggest that resource utilisation is relatively low, and despite a recovery it is not anticipated that resources will become strained in either the United States or Europe during the forecast period.

There remain nevertheless a number of factors that obstruct a more pronounced upswing. Uncertainty on the financial markets is still high, partly as a result of the stock market declines of recent years. Consumers' confidence in the future has been undermined, probably due to geopolitical concerns and the weak development in the labour market. Activity in the euro area has been poorer than anticipated in the December Inflation Report. The low level of growth is exerting additional pressure on the already strained budgets of several euro countries, thus creating the need for further tightening in order to comply with the Stability and Growth Pact.

All in all, the global economy is currently undergoing a period of recovery characterised by some availability of unutilised resources and an expansionary economic policy. However, the recovery that is anticipated during the forecast period will be somewhat weaker than was outlined in the December Inflation Report. Growth is expected to rise during the forecast period, but it is also assessed that there will still be unutilised resources at the end of the period.

■ ■ Economic policy and productivity driving the United States.

Preliminary data for 2002 show that growth in the United States reached 2.5 per cent for the full year but that the rate of growth was slightly lower during the second half of the period. The conditions for a continued recovery in the US economy appear relatively favourable.

Tax reductions, higher public spending and low interest rates are currently bolstering consumption and investment. The US administration has announced further fiscal stimulatory measures, corresponding to

approximately 2 per cent of GDP for 2003 and 2004. These measures will most likely be temporary and there is some risk that long-term interest rates will rise as a result of a substantial increase in the budget deficit, particularly during 2004. The proposed tax cuts are mainly aimed at high-income households, which usually have a lower consumption propensity. On the whole, it is expected that fiscal policy will continue to fuel growth, while monetary policy is expected to be less expansionary from around the end of the year.

The ratio of stocks to sales in the corporate sector is low, as are investment levels (Figs. 14 and 15). So far productivity growth has been firm, mainly due to rationalisation measures, and this has contributed to an improvement in corporate earnings growth and cash flows. Conditions are, thus, favourable for an increase in manufacturing output and investment during the spring. The Purchasing Managers' Index has pointed to an improvement in orders and production in manufacturing. The index has fluctuated considerably in past months, however, reflecting the uncertainty that currently prevails over the economic picture. Consequently the revival is expected to be moderate.

US households have become more pessimistic about the future, probably as a result of persistent falls in share prices and heightening geopolitical concerns. Recent labour market statistics indicate that the labour market is still weak. Wage rises have been moderate and disposable incomes no longer benefit as strongly from tax cuts or lower mortgage costs. Moreover, oil prices are rising and this tends to have a relatively strong impact on US consumers. Growth in consumption is therefore judged to be sluggish during the first half of the year, after which it will accelerate in the autumn when there is a more distinct improvement in the labour market.

All in all, the picture of recovery in the United States is largely unchanged from that of the December Inflation Report.

■ ■ Euro area impeded by low productivity.

Recent data in the euro area indicate weaker activity than was anticipated in the December Inflation Report. This is particularly true for Germany, where growth in private consumption has been slacker than expected, but also for France, Italy and Spain, where activity has also been somewhat more lethargic (Fig. 16).

The labour market in the euro area is less responsive to changes in activity than its US counterpart. The weaker growth in Europe has therefore also resulted in lower growth in productivity and earnings as well as greater cost pressure (Fig. 17). Companies have to a certain extent passed on these cost rises to consumers, thus driving up underlying inflation and reducing households' real disposable incomes and consumption. This is largely cyclical in nature and has been a typical feature of previous business activity patterns. However, the combination of unexpectedly low growth and higher inflation may also be a sign that the potential growth of the euro area is somewhat lower than was previously assumed.

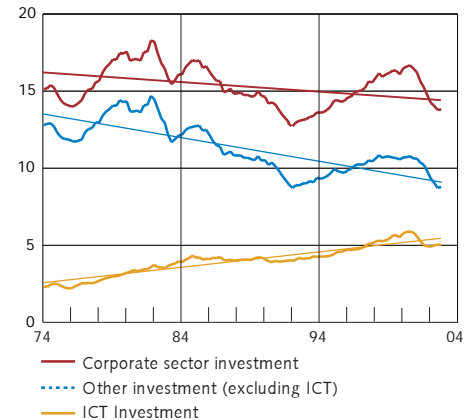
In spite of the weaker activity, several factors indicate that a cyclical

Figure 14. United States corporate sector stocks ratio. Stocks/sales



Source: Bureau of Labor Statistics.

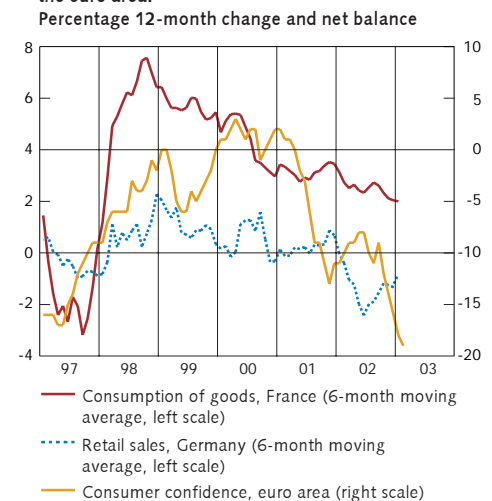
Figure 15. United States corporate investment ratio. Percentage of corporate sector gross product



Note. ICT refers to the information, communication and telecom sector.

Source: US Department of Commerce.

Figure 16. Consumption and consumer confidence in the euro area.



Sources: European Commission, German Bundesbank and the INSEE.

Figure 17. Euro area: productivity and unit labour costs.
Percentage 12-month change

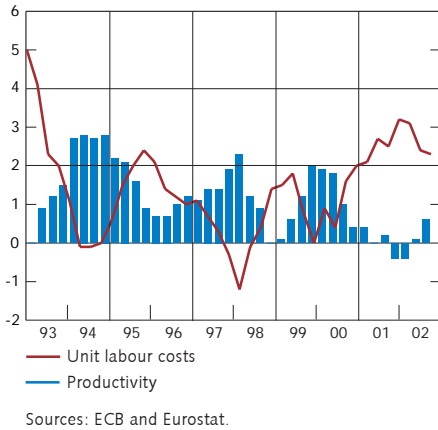
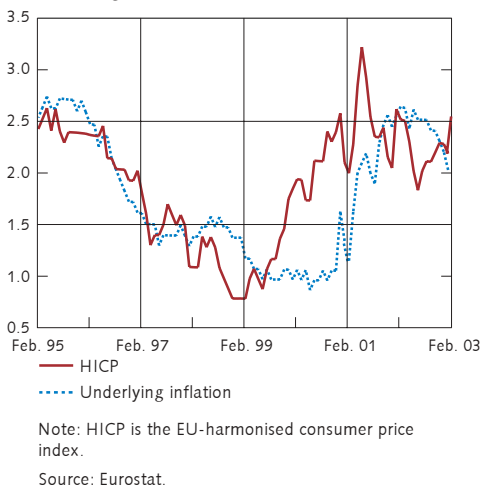


Figure 18. Euro area inflation.
Percentage 12-month rate



upswing may now be on the way. Productivity has started to rise, which is expected to stimulate earnings and investment and gradually lead to an increase in employment and consumption. This is also buoyed by the fact that inflation is low. At the same time households' disposable incomes are expected to improve, partly as a result of rising real wages and a stabilisation of the labour market during the latter half of 2003. Counteracting this is the fact that the stronger euro is hampering net exports.

The scope for expanding economic policy is limited at present. Several countries are being forced to conduct a restrictive fiscal policy to meet the requirements of the Stability and Growth Pact. In Germany the previously announced tax cuts have been abandoned, thus impairing household consumption in the short term. Moreover, France is expected to proceed with its planned tax cuts, despite the risk that its public finances will exceed the limits imposed by the Pact. All in all, fiscal policy is judged to be less expansionary during the forecast period compared with the assessment in the December Inflation Report.

In light of the high inflation figures during 2002 monetary policy has only provided a small stimulatory effect. Recently, underlying inflation in the euro area has fallen slightly. This is partly due to the fact that the effects of transitory disruptions such as the introduction of the euro are diminishing, but is also a consequence of an easing in cost pressure following the recovery in productivity (Fig. 18).¹³ In addition, estimates of resource utilisation indicate that inflationary pressure is currently limited as well as being somewhat lower than previously expected. The underlying price pressure is anticipated to alleviate further, as productivity growth continues to rise and unit labour costs decline. Weak growth is also foreseen in import prices, due in part to the appreciation of the euro.

On the whole, the forecasts for growth and resource utilisation have been revised down slightly compared with the December Inflation Report. A gradual rise in growth is foreseen, and this will contribute in 2004 to a revival in resource utilisation without generating any problematic inflationary pressure during the forecast period.

■ ■ The United Kingdom and the Nordic region – continued growth if somewhat weaker.

Growth in the United Kingdom has been sustained relatively well in recent years, mainly as a result of greater private consumption. This has been fuelled to a certain extent by a continued strong development in household real incomes, largely due to rapidly rising real estate prices. A slight slowdown in the housing market is foreseen, which is expected to dampen consumption somewhat. On the other hand, growth is expected to receive continued support from rising consumption and investment during 2004.

In the Nordic countries, mounting domestic demand has cushioned the effects of the international slowdown. Nevertheless, it appears that growth in 2003 will be lower than was anticipated in the December Inflation Report.

¹³ Eurostat (2002) has estimated the price effect of the euro changeover at 0.2 percentage points of HICP in the euro area. The price changes seem to vary from country to country, however. For example, the effect on HICP in the Netherlands has been estimated at 0.6 percentage points (Folkertsma, 2002).

tion Report, primarily because the poorer prospects for the euro area are hampering export demand. The conditions for a continued recovery over the coming years are favourable, however.

■ ■ Upswing in Asia despite continued weakness in Japan.

Growth has been unexpectedly positive in Japan, while the majority of indicators for the real economy have suggested that activity will continue to be slack. Manufacturing output has been strong, however, due to an extensive turnaround in stockbuilding and rising exports. Nevertheless, the problems of a weak financial system and domestic deflation still remain. The announced measures aimed at tackling the problems in the banking system are not judged to be sufficiently comprehensive to solve the crisis. Furthermore, there is a risk that the problems will intensify as a consequence of the weak stock market performance. The domestic deflationary pressure is expected to persist during the forecast period.

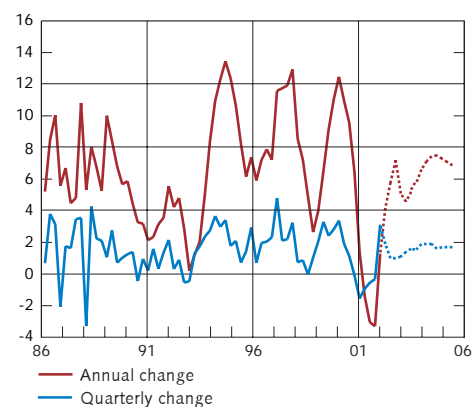
Demand in the rest of Asia has grown relatively sharply. Exports and manufacturing activity have continued to improve in the region in spite of the slightly weaker international growth. This in turn has contributed to falling unemployment and rising private consumption. The economic outlook remains favourable over the forecast period.

■ ■ Somewhat weaker export market with gradually rising prices.

Compared with the December Inflation Report, growth is proving weaker in Europe and Japan, while the GDP forecast for the United States is largely unchanged (Table 5). Lower-than-expected import figures for the United States during the fourth quarter of 2002 have led, however, to a reduced forecast for world market growth in 2003. In the subsequent years the Swedish export market is judged to grow more rapidly. All in all, world market growth is expected to be moderate and marginally weaker during the forecast period compared with the December Inflation Report (Fig. 19).

However, weaker growth and somewhat lower resource utilisation is not judged to lead to appreciably lower international price pressure. Oil prices are currently around USD 10 higher than the forecast presented in the December Inflation Report. The high oil prices are partly due to the greater uncertainty over a potential war in Iraq and its outcome. At the end of last year a round of strikes began in Venezuela, the world's fifth largest oil producer. In addition, oil stocks in the United States are at their lowest level for almost 30 years. On the whole, this means that oil prices are expected to move higher in the short term, after which they should fall back towards the earlier forecast, which is in line with futures prices in the slightly longer term. Looking ahead, secondary effects of the higher oil prices are expected to bolster export prices to a certain extent. All in all, however, a marginally lower increase in international export prices is foreseen in the short term as a consequence of slacker global market growth and weaker export price performance. During 2005 prices are expected to rise at a somewhat faster rate in line with a gradual improvement in demand and higher resource utilisation.

Figure 19. Swedish exports: market growth.
Per cent



Note: The broken lines are forecasts by the Riksbank.
Sources: NIESR and the Riksbank.

**Table 5. International conditions.
Percentage 12-month change or annual level**

	GDP					CPI				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
United States	0.3	2.4 (2.4)	2.9 (2.9)	3.5 (3.5)	3.2	2.8	1.6 (1.6)	2.1 (2.0)	2.3 (2.1)	2.2
Japan	0.4	0.3 (-0.2)	0.8 (1.0)	1.1 (1.5)	1.5	-0.7	-0.9 (-0.9)	-0.7 (-0.5)	-0.2 (-0.2)	0.2
Germany	0.6	0.2 (0.3)	0.8 (1.3)	1.8 (1.9)	2.0	2.1	1.3 (1.4)	1.1 (1.0)	1.4 (1.6)	1.5
France	1.8	1.2 (1.0)	1.4 (2.0)	2.4 (2.5)	2.6	1.8	1.9 (1.9)	1.7 (1.6)	1.6 (1.6)	1.6
United Kingdom	2.0	1.6 (1.6)	2.2 (2.5)	2.5 (2.6)	2.7	2.1	2.2 (2.1)	2.5 (2.4)	2.4 (2.5)	2.5
Italy	1.8	0.4 (0.4)	1.4 (1.8)	2.4 (2.4)	2.5	2.3	2.6 (2.6)	2.3 (2.2)	1.9 (2.0)	2.2
Denmark	1.4	1.6 (1.6)	1.8 (2.1)	2.1 (2.2)	2.2	2.3	2.4 (2.4)	2.1 (2.2)	2.0 (2.2)	2.0
Finland	0.6	1.6 (1.6)	2.6 (2.9)	3.2 (3.2)	3.6	2.7	2.0 (2.2)	1.8 (2.0)	1.8 (2.0)	1.8
Norway	1.3	1.2 (1.4)	1.3 (2.1)	2.6 (2.5)	2.7	3.0	1.3 (1.2)	3.0 (2.1)	2.0 (2.5)	2.5
Euro 12	1.4	0.8 (0.8)	1.4 (1.8)	2.4 (2.4)	2.5	2.4	2.2 (2.2)	1.9 (1.8)	1.8 (1.9)	1.8
Sweden's TCW export markets	1.3	1.1 (1.1)	1.7 (2.0)	2.5 (2.5)	2.6	2.3	1.9 (1.9)	1.9 (1.8)	1.8 (1.9)	1.9
OECD 19	0.9	1.5 (1.4)	2.0 (2.2)	2.7 (2.7)	2.6	2.0	1.4 (1.4)	1.6 (1.6)	1.7 (1.7)	1.8
			2001	2002	2003	2004	2005			
Market growth for Swedish exports			0.8	1.9 (1.8)	5.5 (6.3)	6.7 (7.0)	7.2			
OECD area export price in national currency			0.4	-0.4 (-0.4)	0.7 (0.9)	1.4 (1.2)	2.1			
Crude oil price (USD/barrel, Brent)			24.5	25.0 (24.7)	27.7 (23.9)	22.4 (22.2)	20.7			

Note. In the United Kingdom CPI stands for RPIX and in Germany, France, Italy, Denmark and Finland for HICP. In Norway GDP refers to the mainland economy. The figures in parentheses are the assessments in the December Report. Market growth for Swedish exports is measured in terms of imports of goods to all countries that are recipients of Swedish exports, weighted with each country's share of Swedish exports of goods 2000-01.

Source: The Riksbank.

Demand and supply in the Swedish economy

The revised National Accounts show that GDP growth averaged 3.2 per cent over the period 1994-2001. This figure is somewhat higher than was previously reported. Moreover, the average number of hours worked has increased at a slightly slower rate during the period compared with previous data. On the whole, this means that average labour productivity in the entire economy has risen 0.3 percentage points quicker per year. This is a significant change and also leads to the conclusion that growth potential in the Swedish economy has probably been somewhat higher than previously assumed.

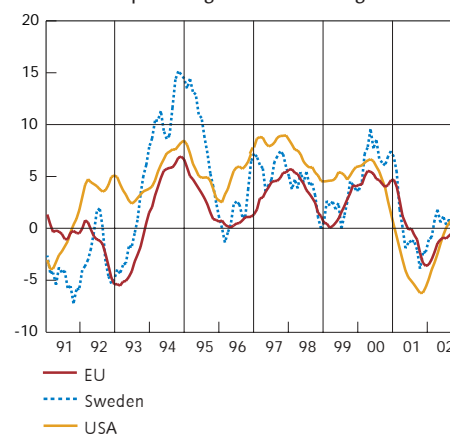
During 2001 and 2002, the Swedish economy, like the economies in the rest of the world, suffered a decline in growth, and resource utilisation was subdued. GDP growth was weak in 2001. In 2002 GDP increased by 1.9 per cent compared to the previous year. Productivity growth was strong as the number of hours worked also fell by 1.2 per cent. There was a decrease in investment, however, and growth in household consumption was subdued despite very favourable development in disposable incomes. At the same time public consumption rose relatively sharply. Net exports made a large positive contribution to GDP growth, as imports declined and exports increased somewhat. The rise in exports was interrupted during the summer, partially due to weaker growth in international demand.

The first six months of 2002 witnessed a recovery in Swedish manufacturing activity and production rose, only to fall back toward the end of the year. This was a different pattern than that in the United States and the EU, where there was a more protracted, uninterrupted recovery. On average the telecom industry made a negative contribution of almost 1 percentage point to the change in Swedish manufacturing output in 2002. Its contribution in the fourth quarter was -1.7 percentage points. This means that manufacturing output excluding telecom products rose 0.6 per cent between the fourth quarter of 2002 and the corresponding quarter in 2001, while the rise was 1.1 per cent when including telecom products.

A normal cyclical pattern speaks for a strengthening of activity during 2003. The current situation is marked, however, by great uncertainty over the effects of the stock market decline and the Iraq crisis, for instance. In addition households have recently been affected by rises in municipal and county council taxes, higher electricity prices, fears of higher oil and petrol prices, and rising unemployment. This has also been reflected over the past six months in a clear deterioration of household expectations of their own economy, for instance. In contrast, the monthly business tendency survey of the National Institute of Economic Research indicates a distinct improvement in manufacturing activity. The telecom industry has contributed to this improvement, although the situation for the production of motor vehicles, for instance, is also considerably brighter.

GDP growth is expected to reach 1.7 per cent this year and 2.4 per cent in both 2004 and 2005. Thus, the growth path outlined in the main scenario is rather flat. Resource utilisation in the economy is not presently

Figure 20. Manufacturing output.
Smoothed percentage 12-month change



Sources: Eurostat, Federal Reserve and Statistics Sweden.

judged to be inflationary and the developments outlined here are not expected to lead to any marked change in this regard during the forecast period.

**Table 6. Demand and supply in the main scenario.
Percentage annual change**

	2001	2002	2003	2004	2005
Household consumption	0.2	1.3 (1.5)	1.8 (2.1)	1.8 (2.1)	1.8
Public authorities consumption	0.9	2.1 (1.6)	0.3 (0.4)	0.7 (0.7)	0.7
Gross fixed capital formation	0.8	-2.5 (-3.0)	2.5 (3.5)	7.1 (6.0)	4.4
Stockbuilding	-0.4	-0.1 (-0.5)	0.3 (0.3)	0.1 (0.1)	0.0
Exports	-0.8	0.4 (0.9)	4.0 (4.4)	4.9 (4.8)	6.0
Imports	-3.5	-2.7 (-2.1)	4.6 (4.9)	5.7 (5.9)	5.5
GDP at market values	1.1	1.9 (1.5)	1.7 (2.1)	2.4 (2.3)	2.4

Note: Forecast for 2003-2005. The figures in parentheses are the assessments in the December Report. Stockbuilding is expressed as a percentage contribution to GDP growth.

Sources: Statistics Sweden and the Riksbank.

■ ■ Rise in foreign trade during 2003.

Market growth for Swedish exports is estimated to have amounted to just below 2 per cent in 2002. Swedish product exports rose 2.3 per cent and market shares, which fell in 2001, increased only marginally. The crisis in the telecom industry, which made a major negative contribution to the growth in goods exports in 2001, continued in 2002. The weak krona and the slow price development of Swedish goods exports has therefore not yet led to the increase in volumes of goods exports that would otherwise have been expected.

World market growth is expected to rise more tangibly in 2003 to around 5.5 per cent, after which it should gravitate towards 7 per cent in 2004 and 2005. These growth figures are not remarkably high from a historical perspective, although there is considerable uncertainty surrounding the international situation. Given the forecast market growth, exports of goods are expected to rise approximately 5 per cent in volume in 2003 and 2004, and by 6 per cent in 2005. This will entail some loss of market shares, partly due to the stronger krona.

While exports of goods have developed largely as forecast, the negative trend for volumes of imported goods has been somewhat unexpected. Consequently net exports made a sizeable contribution to GDP growth (around 1.5 percentage points) in 2002. The lower-than-expected import figures are mainly attributable to the weak development in demand components with high import content, such as machinery investment, stockbuilding and household consumption. Furthermore, the weak krona and a curtailment of Swedes' travel abroad in the aftermath of the terrorist attacks have subdued imports of services, even if this has shown renewed strength in recent months.

A more standard development of imports in relation to demand is foreseen during this year and in coming years. Consequently the contribution made by net exports to GDP growth is expected to be slightly positive during the forecast period.

■ ■ Change in fiscal police from expansionary to neutral.

The public sector financial surplus fell sharply between 2001 and 2002. The deterioration was attributable to changes in both budgetary income

and expenditure, such as cuts in central government income tax, an extension of parental insurance, a higher level of unemployment insurance and maximum fees for the childcare system. An additional cause of the weaker balance was the slacker economic growth, which has entailed higher public spending and lower tax payments, particularly with regard to capital gains tax.

The slowdown in economic growth caused a deterioration in the public finances last year. The revised National Accounts including a higher GDP level of approximately SEK 100 billion will also require an increase in public sector saving of around SEK 2 billion in order to retain an unchanged target balance of 2 per cent of GDP. From 1998-2001 the surplus in the public sector's financial balance was on average almost 3 per cent of GDP. The surplus for the period 2002-2005 is estimated on average to be less than 1 per cent of GDP (Fig. 21).

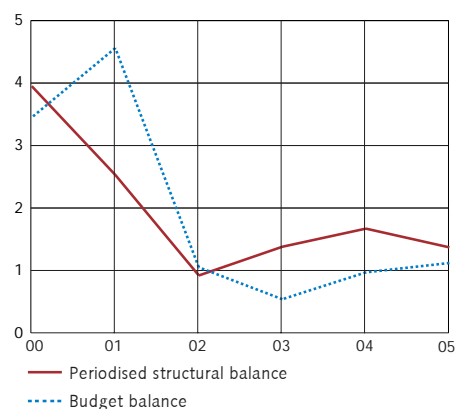
One conventional way to analyse the direction of fiscal policy is to exclude the effects of economic activity on the public finances and analyse changes in the underlying balance. When various periodisation effects are taken into account, calculations show that the structural balance has dwindled over the past two years. Together with the relatively comprehensive changes to taxes and incomes, this leads to the conclusion that fiscal policy has been expansionary. During the remainder of the forecast period, the structural balance is estimated to be largely unchanged whereby fiscal policy can be considered to be neutral.

Preliminary estimates from the Swedish National Financial Management Authority show that central government spending fell slightly short of the expenditure ceiling. Some expenditure booked in 2002 related in actual fact to 2003, and this will better enable the Government to meet the expenditure ceiling this year. Spending cuts will be necessary, however, if central government spending is to remain below the ceiling, and this could hamper investment and consumption in the central government sector. The Government proposal to share responsibility for the costs of illness-related absenteeism is assumed to be implemented in some form as from the middle of this year. If this is not accompanied by a downward adjustment of the expenditure ceiling, the proposal will entail lower central government spending and a reduced need for further public cutbacks.¹⁴ The public sector financial balance will not be affected, however.

■ ■ Weak growth in household income.

Following the sharp growth in household disposable income in 2002, household income is expected to grow at a considerably slower pace during 2003-2005. This year income growth will be dampened by higher taxes and fees as well as by reduced employment in terms of hours worked. In real terms, wage income will rise moderately in 2003 and transfers from the public sector will continue to contribute positively to growth in real disposable income. Wage income is expected to make a greater contribution to income growth in 2004 and 2005 as employment increases once again.

Figure 21. Budget balance and periodised structural balance.
Per cent

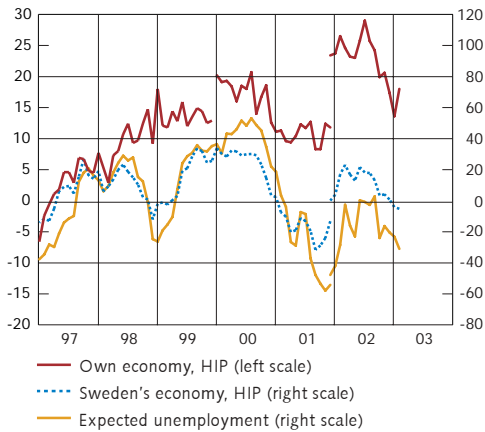


Note. The structural balance is the budget balance adjusted for cyclical effects of the output gap. The periodised structural balance is the structural balance after reallocations of tax income between the years have been carried out.

Sources: The Ministry of Finance, Statistics Sweden and the Riksbank.

¹⁴ See the Riksbank's statement on the Department memorandum (Ds 2002:63) entitled "Stronger incentives for employers to reduce illness-related absenteeism", Dnr 03-317-DIR.

Figure 22. Households' expectations of their own economy, Sweden's economy and unemployment. Net balance



Sources: National Institute of Economic Research and Statistics Sweden.

■ ■ Slacker growth in consumption.

Household consumption is mainly determined by growth in real disposable income but also of real net wealth. The prolonged decline on stock markets has contributed to an increase in uncertainty over the value of households' future wealth, and this is subduing consumption growth. The stock market decline also affects the value of households' future pensions to the extent that such savings are invested in the stock market. Households may therefore increase their saving to compensate for lower pensions in the future. The largest component of household wealth is comprised of housing. In spite of the stock market decline and the sluggish economic growth, house prices have continued to rise.

Although household disposable income increased sharply last year, growth in consumption was relatively low, partly as a result of a curtailment in travelling in the wake of the terrorist attacks in the United States and the relatively weak krona. Moreover, household confidence in the future deteriorated due to expected rises in municipal and county council taxes, the Iraq crisis and price increase on oil and electricity (Fig. 22). There is reason to believe that households will seek to spread their consumption over time. This means that periods of strong income growth will not necessarily result in sharp growth in consumption. Another decisive factor is whether income changes are permanent or temporary. A temporary rise in income does not normally lead to as big a rise in consumption as a permanent one.

There are several reasons to assume that households' uncertainty will continue. The effects of the stock market decline are unclear, unemployment has increased somewhat over recent months and the security policy situation is difficult to assess. Lower electricity and oil prices should enhance confidence in the future, however. Household wealth is also expected to rise in coming years through a recovery in the value of shares and an expected slowdown in the rate of borrowing.

All in all, household consumption is judged to increase by around 1.8 per cent per year from 2003-2005. On average this is a slightly lower rate of increase than that for total production and is weaker compared with the assessment in the December Inflation Report.

■ ■ Rise in public consumption in 2002 – weaker growth in the future.

Public consumption increased 2.1 per cent in 2002. Local government consumption was boosted last year by central government subsidies that increased employment in healthcare, education and nursing.

Consumption by central government authorities also rose. Public consumption this year and in coming years is expected to increase at a much slower rate of around 0.5 per cent per year. Growth in central government authority consumption is judged to be negative this year as a result of the situation in the public finances. In 2004 and 2005, the volume of central government authority consumption is expected to remain largely unchanged.

The economic picture will also be strained for municipalities during the forecast period. Compared with previous years growth in local government consumption is expected to be weak in the future. Local

government activities are mainly financed by taxes on income from employment and, as employment and the number of hours worked are expected to grow at a low rate, income from taxes will also rise slowly. The finances of the municipalities and county councils are also being affected by the high level of illness-related absenteeism. The direct costs of this are mainly a burden for the central government, but they also reduce the ability of the central government to compensate municipalities for new requirements and other rises in costs. Demographic developments alone are estimated to require annual growth in local government consumption of 0.3 per cent per year over coming years. Moreover, wage rises in the local government sector are expected to exceed the average for the economy as a whole during the forecast period.

■ ■ Uncertainty restraining investment activity.

Total gross fixed capital formation fell 2.5 per cent in 2002. The fall was particularly marked in corporate sector investment where there was a pronounced decline during the fourth quarter. On the other hand, central government and local government investment rose last year.

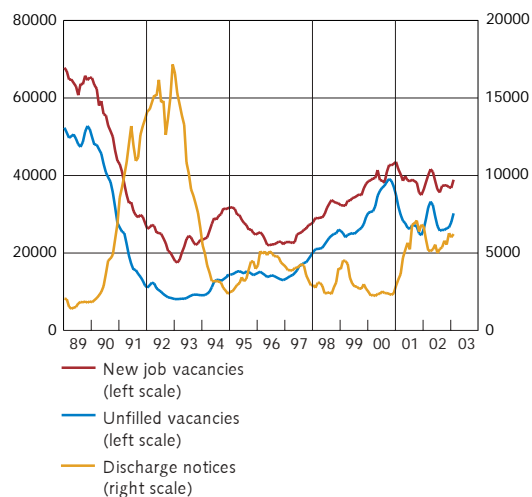
Corporate investment demand is adversely affected by great uncertainty and pessimism. For this reason the concerns over both the security policy situation and the stability and strength of domestic and international economic activity is expected to suppress corporate investment demand in the short term. However, the assessment made in the December Inflation Report still remains that a rise in demand in the economy is expected in time to lead to increased utilisation of capital stocks and a need to invest during the latter part of the forecast period.

The contribution made from stock investment to GDP growth in 2002 was not as negative as expected. The contribution from stocks, which was negative in both 2001 and 2002, is expected to be positive this year and thereafter assumed to be largely neutral.

■ ■ Rise in open unemployment this year.

The labour force surveys for last year show that employment increased by an average of 0.1 per cent compared with 2001, while open unemployment was unchanged at 4.0 per cent. Growth in employment was negative in the manufacturing industry last year, but positive in construction and the public sector. Employment in the private services sector rose slightly compared with 2001 although unemployment growth tapered off during the latter half of last year. The corporate sector appears to have an ample supply of labour. This is evident from the low labour shortage figures in the latest quarterly business tendency survey of the National Institute for Economic Research, which also shows that companies in the construction sector and most of manufacturing expect to reduce the number of employees during the first quarter of the year. In the service industries there is the prospect of little change in employment. Weak prospects are also indicated by the development of job vacancies reported to the employment offices (Fig. 23). All in all, some fall in corporate sector employment is foreseen in 2003, followed by a slight increase in 2004 and 2005. Meanwhile a small drop in public sector employment is expected during 2003 due to the strained financial situation.

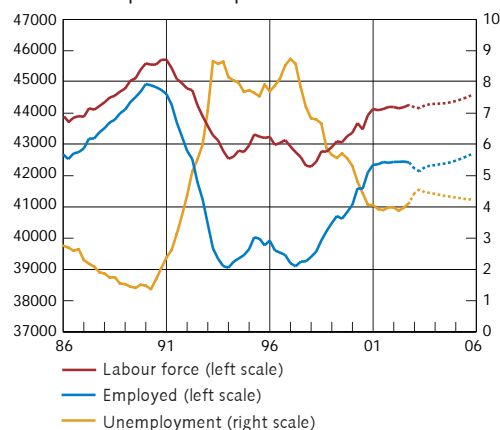
Figure 23. New and unfilled vacant jobs with a duration of more than 10 days and discharge notices, 1987 Q1-2003 Q1.



Note. Seasonally-adjusted series expressed as three-month moving average.

Source: National Labour Market Board.

Figure 24. Labour force, employment and open unemployment. 100s of persons and per cent



Note. Seasonally-adjusted series. Riksbank forecast 2003 Q1-2005 Q4.

Sources: Statistics Sweden and the Riksbank.

While there was a marginal rise in employment during 2002, the number of people in work dropped 0.6 per cent. This implies that the number of absentees also continued to rise last year. The main cause of this was absenteeism due to illness, which according to the labour force surveys increased by 5.7 per cent.¹⁵ The rate of increase has subsided, however, and the rise in 2002 was the lowest since 1998.

During the fourth quarter of 2002, the number of hours worked fell compared with the corresponding quarter in 2001. This means that the mean working time per employee continued to decrease.¹⁶ The latest monthly labour force surveys also indicate that mean working time is still developing negatively. This can be partially attributed to the growth in absenteeism, although regular working time and overtime has also continued to fall.¹⁷ This warrants some downward revision of the forecast for mean working time in 2003. Although some wage agreements include provisions for further cuts in working hours, the tendency for mean working time to shorten is expected to cease in 2003 and 2004, mainly because the economic recovery should result in increased overtime.

According to the labour force surveys the number of people in the labour force rose by an average of 0.1 per cent in 2002. A marginal increment is expected in the labour force during the forecast period. A favourable increase in the economically active population is foreseen, mainly in the age groups 16-19 years and 55-64 years. However, these age groups have a lower-than-average participation in the labour force. Moreover, the strong growth in the population of the younger age group implies a rise in the number of students in regular education. The number of long-term sick and people in early retirement outside the labour force increased by 9.1 per cent during 2002 and this is judged to go on rising during the forecast period, albeit at a slackening rate. The number participating in labour market programmes is expected to remain unchanged this year, after which the number should fall as labour market prospects improve.

Table 7. Estimated increment in the labour force from various components 1000s of persons, percentage 12-month contribution and level.

	2002	2002	2003	2004	2005
Labour force	4421	0.1	0.0	0.2	0.4
<i>Of which net contribution from:</i>					
Population 16-64 years	5666	0.8	0.7	0.8	0.9
Labour market training programmes	93	-0.2	0.0	0.2	0.2
Regular education	424	-0.2	-0.3	-0.3	-0.3
Early retirement and illness-related absence	378	-0.7	-0.6	-0.6	-0.5
Other	351	0.4	0.1	0.1	0.1

Note. The item "Other" includes domestic work, military service, holidays, retirement (not early retirement for health reasons), expatriate workers, people living abroad and others.

Sources: The National Labour Market Board, Statistics Sweden and the Riksbank.

¹⁵ In 2002 the rise in the number of absentees due to illness accounted for 38 per cent of the increase in the total number of absentees. Absence due to holidays accounted for 27 per cent, care of children for 13 per cent, and other absence for 22 per cent.

¹⁶ Mean working time is measured here as the total number of hours worked during the year according to the National Accounts divided by the average number of employees according to the labour force surveys.

¹⁷ Regular working time refers to the time the employee must work according to the agreement entered into with the employer.

All in all, employment is judged to be somewhat lower and open unemployment somewhat higher this year than was foreseen in the December Inflation Report (Table 8). The recovery in the labour market is not expected to start until the end of 2003 or the beginning of 2004.

■ ■ Somewhat lower resource utilisation.

The revision of the National Accounts resulted in slightly higher figures for GDP and productivity growth. Inflation, however, was not revised. The new economic statistics show that it has been possible to combine a somewhat higher production growth with the same rate of inflation. New estimates of potential growth and the output gap (Fig. 25) indicate a somewhat higher growth potential and slightly lower resource utilisation in recent years.

The picture of resource utilisation in the economy provided by estimates of the output gap can be supplemented with other indicators, such as labour shortages, data on capacity utilisation and bottlenecks according to the business tendency surveys, or various labour market statistics showing the ease or difficulty of recruitment.

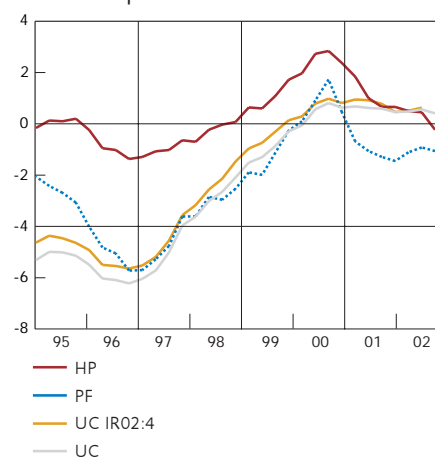
In general the business tendency surveys have shown resource utilisation in the relevant areas of the corporate sector to be less than the average for recent decades (Figs. 27 and 28).¹⁸ These indicators have not displayed any marked change since the December Inflation Report. The number of manufacturing companies reporting access to factors of production as the primary bottleneck is relatively low, as are labour shortages of skilled workers and technical employees. Capacity utilisation for computer consultants and other business services remains low, despite a slight increase at the end of 2002. Haulage firms are an exception here with a capacity utilisation somewhat above the historical average.

At the beginning of 2002 there was a large number of unfilled vacant jobs in the public services sector, indicating great demand for labour and difficulties in filling vacancies. Since then the number of vacancies has fallen substantially.

Countering the view that resource utilisation is presently low in the entire economy is the fact that the labour market is relatively tight, even if unemployment has risen slightly in recent months. The high rate of absenteeism may come to function as a labour reserve, but the effects of the proposed measures to counteract absenteeism are uncertain, as is the extent to which the previously long-term sick will suit future vacancies. The labour shortages indicated in the tendency surveys could also change rapidly if companies need to recruit on a wider scale and the focus is then shifted towards the difficulty in finding labour with the right skills.

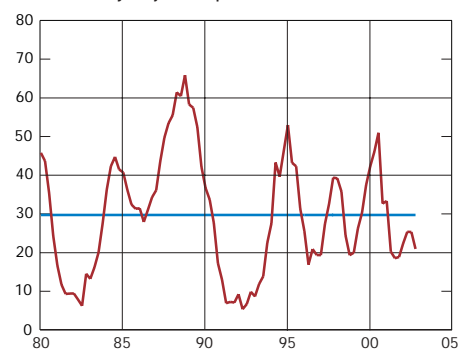
All in all, it is judged that resource utilisation in the economy is currently having a certain restraining effect on inflation. This forecast also implies moderate production growth in the economy. In the main scenario, therefore, the forecast development is not expected to give rise to bottlenecks in the economy. A somewhat lower resource utilisation is foreseen during the forecast period compared with the December Inflation Report.

Figure 25. Econometric estimates of the output gap.
Per cent of potential GDP



Note: HP stands for the Hodrick-Prescott (or Whittaker-Henderson) filter. UC is the unobserved components method and PF is the production function approach. For a description of the methods, see Apel, Mikael & Jansson, Per., "System Estimates of Potential Output and the NAIRU", Sveriges Riksbank Working Paper No 41, Sep 1997. Sources: Statistics Sweden and the Riksbank.

Figure 26. Proportion of manufacturing firms with access to factors of production as the primary bottleneck.
Seasonally-adjusted, per cent

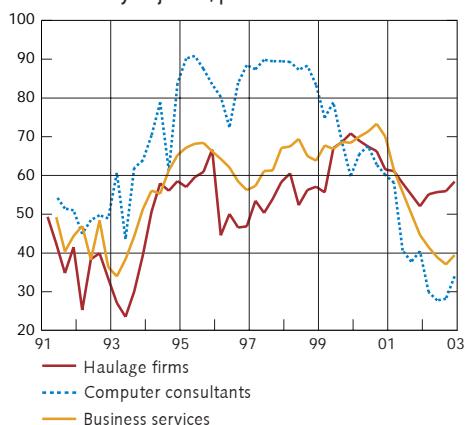


Note. The horizontal line gives the historical mean 1980-2002.

Source: National Institute of Economic Research.

¹⁸ The period covered by the business tendency surveys for the service industries is only 12 years, which is why it is difficult to interpret the present situation in relation to the average for the period.

Figure 27. Proportion of companies with full capacity utilisation. Seasonally-adjusted, per cent



Source: National Institute of Economic Research.

■ ■ Wage rises below 4 per cent this year but corporate expenses higher due to rising pension premiums.

The preliminary wage outcome for 2002 indicates an annual percentage increase of 3.9 per cent for the economy as a whole, which is 0.3 percentage points lower than 2001. It is also a slightly lower rate of wage increase compared with earlier assumptions. The assessment has taken into account that the local bargaining rounds in the central government sector are not yet complete and that retroactive disbursements are still expected.

The slower rate of increase last year is partly attributable to the profile of wage settlements and partly to a deterioration in demand. It was primarily the private services sector and construction that witnessed the lower rates of increase last year compared with 2001. A further slackening of the rate of wage increase is foreseen this year despite a continuation of favourable productivity growth and higher inflation. Municipal taxes were raised an average of SEK 0.65 at the start of this year, and this is expected to exert slight upward pressure on wages.¹⁹ Rising unemployment is, however, expected to outweigh the effects of increased taxes and lead to a lower rate this year. The wage settlements for the majority of the labour market will also apply this year and local wage formation will mainly depend on the situation in the labour market.²⁰ The Municipal Workers' Union (MWU) and its counterparties within municipalities and county councils are still some way from reaching a compromise in negotiations for a new wage agreement for 2003, and mediators have been called in. In light of the municipalities' strained finances, it does not appear likely that MWU will succeed in achieving their wage demands for a rise of 5-6 per cent.

In 2004, wage agreements for approximately 2 million employees will be concluded. These negotiations will probably be initiated at a stage where employment has risen and economic activity has not yet gathered momentum. The cancellation of the municipal workers' agreement is therefore not expected to spread to any great extent to other areas of the labour market. Wage settlements in the economy are anticipated to be at approximately the same levels as the previous bargaining rounds in 2001, while local wage formation is expected to be more subdued as a consequence of labour market conditions and substantial other wage costs in the corporate sector. Prospera's survey of market factors such as inflation expectations includes questions on expected wage rises 1-5 years ahead. Almost all these expectations were revised downward in February by 0.1-0.2 percentage points compared with the previous survey. The one exception was that employer organisations expected wage increases of 3.5 per cent one year ahead, which is 0.1 per cent higher than in November.

Besides wages, labour costs are also influenced by secondary wage costs. The forecast for these costs is unchanged for this year but has been

¹⁹ Short-term elasticity from Forslund, A. & Kolm, A-S., "Active Labour Market Policies and Real-Wage Determination – Swedish Evidence", IFAU Working Paper No.7, 2000. Elasticity here is estimated at approximately 0.5 which, together with an increase of around 0.4 percentage points in the tax wedge, implies a wage increase of approximately 0.2 percentage points.

²⁰ See Friberg, K. & Uddén Sonnégård, E., "Changed wage formation in a changing world?", Sveriges Riksbank Economic Review 1, 2001.

revised upward somewhat for the rest of the forecast period, partly due to rising pension premiums. All in all, total wage costs for the corporate sector are expected to rise by 4.6 per cent this year and by 3.9 per cent in both 2004 and 2005. These increases are somewhat lower than those forecast in the December Inflation Report as a result of a slightly weaker labour market (Table 8).

According to the revised National Accounts labour productivity has increased faster than previously reported. On average growth in labour productivity has been revised up by 0.3 percentage points for the economy as a whole and by 0.8 percentage points for the corporate sector during the period 1994-2001. Moreover labour productivity rose more than expected in 2002 due to both stronger productivity growth and weaker growth in the number of hours worked, compared with the assessment in the December Inflation Report. The assessment of labour productivity growth has also been revised upward slightly for 2003. A mild slackening of productivity growth is foreseen at the end of the forecast period after which growth should be compatible with the economy's long-term production capacity.

The assessment of wage costs and productivity implies lower growth in unit labour costs for last year than in the December Inflation Report. For the rest of the forecast period the assessment is for somewhat lower growth. The revised National Accounts show a slightly higher profit share in the economy than was previously reported, even if this share remains relatively low from a long-term perspective. Given the paths for prices and unit labour costs, the profit share is expected to be somewhat below the historical average during the forecast period.

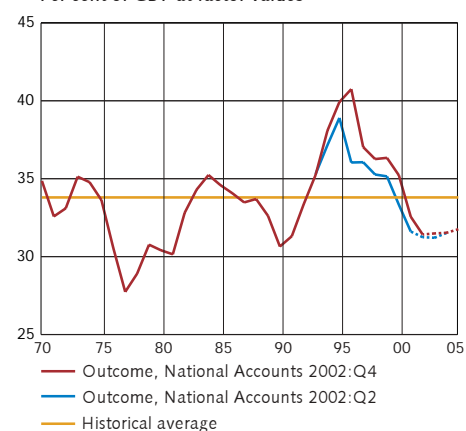
Table 8. Labour market forecast in the main scenario.
Percentage 12-month change

	2001	2002	2003	2004	2005
Nominal wage, total	4.3	4.0 (4.1)	3.8 (3.9)	3.9 (4.1)	3.9
Nominal wage, corporate sector	4.1	3.8 (3.9)	3.6 (3.7)	3.7 (4.0)	3.8
Other wage costs*	1.0	0.3 (0.3)	1.0 (1.0)	0.2 (0.0)	0.2
Total wage costs, corporate sector	5.1	4.1 (4.2)	4.6 (4.7)	3.9 (4.0)	3.9
Labour productivity, corporate sector	0.4	4.1 (2.9)	2.7 (2.5)	2.3 (2.3)	2.2
Unit labour costs, corporate sector	4.7	0.0 (1.3)	2.0 (2.2)	1.6 (1.7)	1.7
Number employed	1.9	0.1 (0.0)	-0.6 (-0.3)	0.5 (0.3)	0.5
Hours worked	0.5	-1.2 (-0.5)	-0.5 (0.1)	0.6 (0.3)	0.5
Mean working time	-1.4	-1.3 (-0.6)	0.1 (0.4)	0.1 (0.0)	0.0
Open unemployment (per cent)	4.0	4.0 (4.0)	4.6 (4.3)	4.4 (4.3)	4.3
Labour market programmes (per cent of adjusted labour force)	2.5	2.6 (2.6)	2.6 (2.6)	2.3 (2.4)	2.2
Profit share	32.6	31.4 (31.2)	31.6 (31.2)	31.7 (31.5)	32.0

Note. The figures in parantheses are the assessments in the December Report.

* The item Other wage costs is calculated as the annual change in the labour costs index less the annual rate of wage increases in the corporate sector and is used here as an approximation for the total economy. Besides statutory and negotiated employer contributions, the item includes, for example, the specific wage tax, sick wages, weekend wages, holiday wages, changes in working time for salaried employees, cash compensation and benefits in kind.

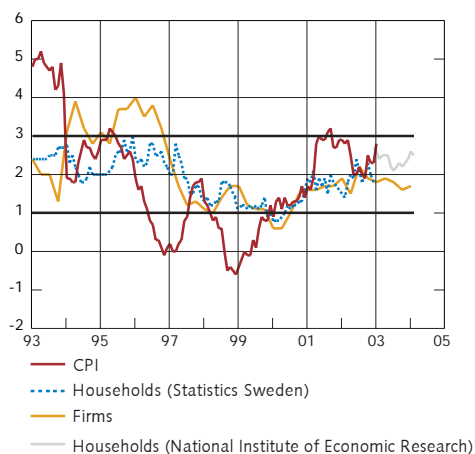
Figure 28. Profit share.
Per cent of GDP at factor values



Note. The horizontal line represents the mean for the period 1970-2001; 2002-05 forecast.

Sources: National Institute of Economic Research, Statistics Sweden and the Riksbank.

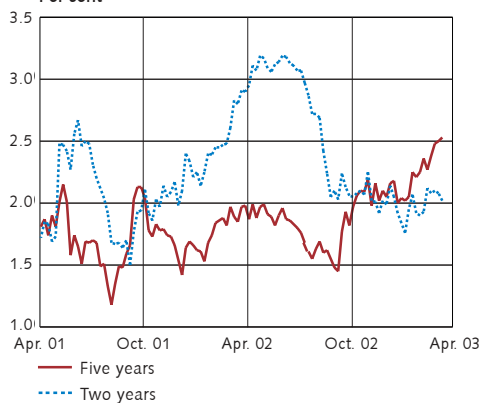
Figure 29. CPI and inflation expectations of households and firms.
Per cent



Note. The curve for expectations has been displaced 12 months into the future to coincide with the CPI outcomes to which the expectations refer. The procedure for collecting households' purchasing plans was changed in January 2002.

Sources: National Institute of Economic Research and Statistics Sweden.

Figure 30. Expectations of inflation two and five years ahead derived from implied forward interest rates.
Per cent



Source: The Riksbank.

Inflation expectations

Households' expectations of inflation one year ahead have risen 0.3 percentage points to 2.5 per cent since the December Inflation Report. One explanation for the higher expectations is that actual inflation has risen. Firms also anticipate a higher level of prices one year ahead according to the business tendency survey of the National Institute of Economic Research and have revised their inflation expectations upward by 0.1 percentage point to 1.7 per cent (Figure 29).

Market prices, derived from implied forward interest rates, also indicate higher inflation expectations five years ahead. Compared with the December Inflation Report expectations have risen 0.3 percentage points to 2.5 per cent (Figure 30). Implied rates five years ahead have risen relatively sharply since the autumn. However, it is unclear whether this rise is a true reflection of higher inflation expectations. The increase can be partially explained by the greater interest in five-year index-linked bonds that has arisen in connection with reduced liquidity in two-year bonds.²¹

Prospera's latest survey in March also points to somewhat higher inflation expectations, particularly in the short term but also in the long term, compared with its survey in November 2002 (Table 9). The expectations of various market players are now 2.4 per cent on average over all time horizons. Money market agents remain the group whose expectations lie closest to the inflation target of two per cent.

Table 9. Expected 12-month rates of inflation according to Prospera's survey in March 2003, unless otherwise stated.

1 year ahead		
Money market agents	2.2	(0.2)
Employer organisations	2.3	(0.1)
Employee organisations	2.4	(0.1)
Purchasing managers, trade	2.3	(0.0)
Purchasing managers, manufacturing	2.6	(0.1)
Households (HIP) in February (January)	2.5	(0.3)
Firms (business tendency survey) in January (October)	1.7	(0.1)
2 years ahead		
Money market agents	2.1	(0.0)
Employer organisations	2.3	(0.1)
Employee organisations	2.4	(0.1)
Purchasing managers, trade	2.4	(0.0)
Purchasing managers, manufacturing	2.6	(0.0)
5 years ahead		
Money market agents	2.1	(0.0)
Employer organisations	2.1	(-0.1)
Employee organisations	2.5	(0.3)
Purchasing managers, trade	2.5	(0.0)
Purchasing managers, manufacturing	2.5	(0.0)

Note. The figures in parentheses are the change in percentage points from the previous survey in November 2002.

Sources: National Institute of Economic Research and Prospera Research AB.

In conclusion, expectations of inflation are higher one, two and five years ahead, and slightly exceed the Riksbank's inflation target, which is probably attributable to higher actual inflation.

²¹ Expectations of inflation two years ahead are largely unchanged since the December Inflation Report, amounting to 2.1 per cent. It is worth noting, however, that real rates two years ahead mature in April 2004, which is why liquidity has decreased and the result has become less reliable. Accordingly the five-year index-linked bond has the shortest duration and best reflects expectations of inflation in the short term.

Deregulations, political decisions and transitory effects

The changes in specific taxes on, for example, energy and carbon dioxide that came into force at the beginning of the year affected inflation in January as anticipated. In its Budget Bill for 2003, the Government announced a continuation of the green tax shift amounting to SEK 30 billion during the period 2001-2010. In light of this it is assessed that CPI and, to a certain extent, UND1X will continue to be affected by higher energy and carbon dioxide taxes during 2004 and 2005.

In addition to the changes in specific taxes, a Government Bill has proposed that all electricity users and suppliers from 1 May must purchase a certain percentage of electricity from renewable energy sources in relation to their electricity consumption. This Bill will lead to higher costs for electricity consumers and provide a contribution to CPI and UND1X of almost 0.1 percentage points from May this year.

Table 10. Contributions to inflation from indirect taxes, subsidies and interest expenditure.
Percentage points

	Dec. 2002	Mar. 2003	Mar. 2004	Mar. 2005
Indirect taxes and subsidies	0.2 (0.2)	0.4 (0.3)	0.3 (0.3)	0.3
of which: indirect effects*	0.2 (0.2)	0.2 (0.1)	0.1 (0.1)	0.1
House mortgage interest expenditure	0.1 (0.2)	0.1 (0.2)	0.1 (0.2)	0.1
Total	0.4 (0.4)	0.5 (0.5)	0.4 (0.5)	0.4

Note. The forecasts in the December Report are shown in parentheses for comparison.

* The indirect effects also show up in UND1X inflation. Indirect effects are the effects on inflation of a change in corporate sector cost levels. For example, higher energy and carbon dioxide taxes can cause a rise in firms' transport costs.

Sources: Statistics Sweden and the Riksbank.

Forecasting inflation with a rising repo rate

Expectations of the repo rate among market operators have been revised downwards since the December Inflation Report. Market pricing shows that there are currently expectations of a reduction in the repo rate during the Riksbank's forecast period. On the other hand, surveys of individual analysts indicate expectations of a raise in the rate two years ahead. In the Riksbank's main scenario, however, inflation is forecast as usual on the technical assumption that the repo rate will be unchanged at the present level of 3.75 per cent; this serves to clarify the consequences for the formation of monetary policy. An illustrative calculation is therefore presented here that incorporates a path for the repo rate that is in line with market expectations as reported in the survey that Prospera undertook on behalf of the Riksbank in February 2003.

According to this survey, the repo rate is expected to remain unchanged one year ahead and to be raised to 4.25 per cent two years ahead.²² Here it is assumed that the short-term market interest rates will broadly follow the repo rate, while the pass-through to the longer rates is

smaller. Compared with the assessments in the main scenario, the short rates are judged to be approximately 0.20 percentage points higher one year ahead and about 0.50 percentage points higher after two years, while the average effect on long rates stops at less than 0.1 percentage point. The higher level of interest rates is also expected to strengthen the krona slightly. The krona's TCW exchange rate is assessed on average to be just under 0.5 percentage points stronger during the forecast period than in the main scenario.

All in all, it is considered that higher interest rates and a stronger exchange rate would lead to somewhat lower GDP growth in the forecast period. Moreover, the stronger exchange rate will subdue import prices (see Table B5).

Lower resource utilisation and a stronger exchange rate both tend to slightly subdue UND1X inflation. But CPI inflation would be somewhat higher than in the main scenario because the downward effects on inflation are countered by the impact of higher house mortgage interest expenditure. On the whole, the effects are very small.

Table B5. Modified inflation forecast, incorporating the interest rates expected by the money market. Percentage change and percentage points

	Annual rate 2003	Annual rate 2004	12-month rate March 2004	12-month rate March 2005
CPI	2.6 (0.1)	1.6 (0.1)	1.1 (0.1)	2.1 (0.1)
UND1X	2.5 (0.0)	1.2 (-0.1)	0.7 (-0.1)	1.7 (-0.1)

Note. The figures in brackets are the difference from the main scenario's rate of inflation with an unchanged repo rate.

Source: The Riksbank.

²² These are median values of the expectations.

Introduction

This appendix describes and analyses the outcome of inflation and the monetary policy implemented by the Riksbank in the period 2000-2002. The purpose of the account is partly to provide a foundation for the Parliamentary Committee on Finance's annual assessment of monetary policy and partly to emphasise experiences that can be of use in the future formulation of monetary policy.

Monetary policy aims at keeping annual CPI inflation at 2 per cent. It is usually assumed that the effect of monetary policy measures is exerted with a certain time lag and that it takes one to two years for changes in the instrumental rate to impact fully on inflation. The Riksbank usually describes its inflation target policy with the aid of a simple rule of action: If forecast inflation, based on an unchanged repo rate, exceeds 2 per cent one to two years ahead, the repo rate will normally be raised in order to fulfil the inflation target, and vice versa if the forecast falls short of the target.

The March Inflation Reports over the past three years have included a basis for evaluating monetary policy during the periods 1997-1999, 1998-2000 and 1999-2001. This appendix provides the corresponding discussion for 2000-2002. As an analysis of inflation outcomes in 2000 and 2001 has already been performed, this appendix primarily examines inflation during 2002. Bearing this in mind, and in light of the Riksbank's future-oriented rule of action, it is therefore natural to concentrate on the forecasts and monetary policy decisions that relate to 2000-2001.

It should be underscored that the Riksbank, like other central banks, does not have an exact rule of action that is applied mechanically. One reason for this is that CPI inflation is affected by disturbances that are not possible to eliminate completely through monetary policy, but that nevertheless subside relatively quickly without any contagion effects on prices or inflation expectations. One example is changes to indirect taxes and subsidies, which are normally assumed to give rise only to one-off changes in the price level and not affect inflation expectations. Another example is that households' mortgage interest expenditure, and thereby CPI, is affected directly when the repo rate is raised or lowered. This expenditure, which comprises a considerable part of CPI, mean that if the Riksbank, for example, should try to counteract a fall in CPI

through interest rate cuts, the immediate effect could instead be even lower inflation (due to lower housing costs). Yet another reason against mechanical reactions to inflation forecasts is that the economy is sometimes hit by what are known as supply shocks, which simultaneously lead to a rise (or fall) in both inflation and economic activity. In such cases a quick return to the inflation target could give rise to major macroeconomic costs, especially in the event of a major deviation.²³

Like other forecasts, the inflation forecasts that guide monetary policy are inherently uncertain. For this reason evaluations of the forecasts' uncertainty are provided in addition to the assessment of economic and inflationary development in the main scenario (the most likely development). This is illustrated in the Inflation Reports with uncertainty intervals for the most likely development. Whether uncertainty is greater or lesser than usual and whether the risk is greatest for higher or lower inflation than in the main scenario are questions of pivotal importance for the formulation of monetary policy, in addition to the question of whether forecast inflation in the main scenario exceeds or falls short of the target.

Inflation exceeded the target in 2001 and 2002 partly due to some well-identified supply shocks, e.g. higher food prices as a result of mad cow disease and foot and mouth disease. The uncertainty in the inflation forecasts was so great at times that the Riksbank partly for this reason chose to delay any interest rate changes. As these phenomena – supply shocks and uncertainty – are also of great significance for monetary policy at present, a closer examination of how the Riksbank has managed such problems on previous occasions would appear particularly urgent, in addition to the usual need to evaluate monetary policy implementation.

Inflation in relation to the target

The Riksbank's inflation target includes a tolerance interval of plus/minus 1 percentage point. The purpose of this interval is to clarify both that deviations from the target are likely and that the Riksbank aims to limit these deviations.

CPI inflation averaged 1.8 per cent per year from 1993-2002. Since the target officially began to be applied in January 1995, inflation has averaged 1.4 per cent per year. There has therefore been a sharp decline in inflation compared with the 1970s and 1980s when it averaged just below 8 per cent per year.

²³ See "The Riksbank's inflation target – clarifications and evaluation", Sveriges Riksbank memorandum 1999-00351 DIR, 4 February 1999.

During the current evaluation period monetary policy was based to a large extent on assessments of inflation as measured by the UND1X index. This index excludes the direct effects on CPI of changes in households' mortgage interest expenditure and changes in indirect taxes and subsidies. The increase in UND1X has averaged 2.1 per cent per year during the period 1993-2002 and 1.9 per cent per year from 1995-2002.

Diagram B10 shows the monthly deviations in UND1X and CPI inflation from the inflation target. During the period 1997-2000 both CPI and UND1X fell short of the inflation target. The deviations were mostly within the tolerance intervals for UND1X, but were greater for CPI. In contrast, the inflation target was exceeded in 2001 and 2002. The deviations here were relatively sizeable until the beginning of 2002. The increase in CPI and UND1X averaged 2.4 per cent and 2.5 per cent for 2002.²⁴

Seen over the calendar years 2001 and 2002 as a whole, the deviations from the target were relatively small, although large deviations occurred in certain months. Given the Riksbank's limited

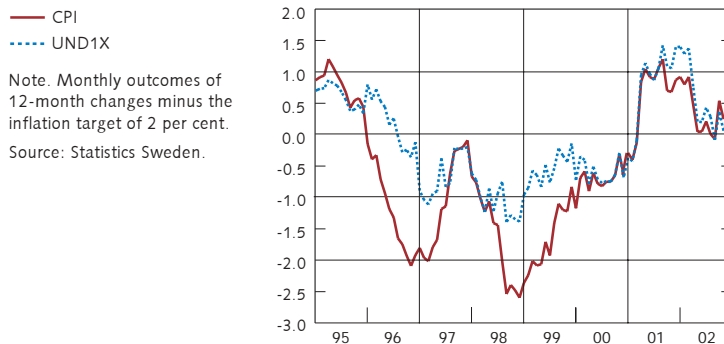
capacity for steering inflation in the short term, such deviations are to be expected from time to time. In addition, deviations from the target can be used for an analysis of other important questions. What forecasts did the Riksbank use as a basis for its monetary policy? On the basis of the available information, should the Riksbank have made a different assessment of the inflationary trend and thereby implemented a different monetary policy? An obvious question, for instance, is whether monetary policy ought to have been tighter during 2000-2001 given that inflation exceeded the target in 2001-2002. It should be underscored that the fact that the Riksbank has announced a clear target and a distinct, if somewhat simplified, rule of action and that it also regularly publishes its forecasts and the minutes of the Executive Board meetings, is an important condition for enabling such analyses to be performed in an effective manner.²⁵

Assessments behind monetary policy 2000-2001

Figure B11 shows the development of the instrumental rates of a select number of central banks. In 2000, interest rates were raised substantially in the rest of the world. The Riksbank increased the instrumental rate at the beginning and end of the year. In 2001, rates were cut in the euro countries, the United Kingdom and the United States, while the repo rate in Sweden was raised (until the cut that followed the terrorist attacks in the United States in September). At the beginning of 2000, instrumental rates in Sweden were marginally higher than that of the euro area though appreciably lower than those of the United States and United Kingdom. By the end of 2001, the United Kingdom was the only country with a higher instrumental rate than Sweden.

Table B6 summarises a number of key forecasts made together with the Riksbank's monetary policy decisions during the two years in question. Figures B12 and B13 show the forecast paths for UND1X and CPI inflation during the period 2000-2001. Up until the first Inflation Report of 2001 inclusive, the Riksbank forecast that inflation (according to the main scenario) would rise slowly but remain at or below the inflation target. Following the increase in inflation at the beginning of 2001, the Riksbank assessed that inflation

Figure B10. Deviation from the inflation target. Per cent



Note. Monthly outcomes of 12-month changes minus the inflation target of 2 per cent.

Source: Statistics Sweden.

²⁴ Other summary measures of the size of the deviations in Figure B10 can be used to describe the fulfilment of the target. RMSE ("Root mean square error") is the square root of the mean of the squared deviations. According to this measure, the deviations in UND1X inflation from the target have been largely of the same magnitude during 2002 (0.74 percentage points) as during the period 1995-2001 (0.76 percentage points). As regards CPI inflation the deviations during 2002 were less than half (0.50) compared with the period 1995-2001 (1.29).

²⁵ This is also something that has made the Riksbank one of the best ranked central banks in terms of openness and transparency, see Eijffinger, S.C.W. & Geerats, P.M. (2002), "How Transparent are Central Banks?", CEPR discussion paper 3188.

Table B6. The Riksbank's monetary policy decisions and selected forecasts.

Date of decision	UND1X inflation forecast Main scenario (annual average), 2000, 2001, and 2002	UND1X inflation forecast Main scenario (12-month figures), one to two years ahead of the forecast date	GDP-growth forecast Main scenario, 2000 and 2001	Uncertainty in inflation assessment	Risk-adjusted inflation forecast (12-month figures), one to two years ahead of the forecast date	Repo rate	Repo rate adjustment
2000-02-03						3.75	0.50
2000-03-22	1.6: 1.8: -	1.6: 2.1	4.0: 3.5	Normal	1.6: 2.1	3.75	0
2000-05-04						3.75	0
2000-06-07	1.2: 1.6: -	1.5: 1.9	4.3: 3.5	Normal	1.5: 2.0	3.75	0
2000-07-06						3.75	0
2000-08-16						3.75	0
2000-10-09	1.4: 1.5: -	1.5: 1.9	4.0: 3.7	Normal	1.6: 2.1	3.75	0
2000-12-06	1.4: 1.7: 1.8	1.8: 1.9	3.9: 3.4	More than normal	2.0: 2.3	4.00	0.25
Date of decision	UND1X inflation forecast Main scenario (annual average), 2000, 2001, and 2002	UND1X inflation forecast Main scenario (12-month figures), one to two years ahead of the forecast date	GDP-growth forecast Main scenario, 2000 and 2001	Uncertainty in inflation assessment	Risk-adjusted inflation forecast (12-month figures), one to two years ahead of the forecast date	Repo rate	Repo rate adjustment
2001-02-01						4.0	0
2001-03-26	1.5: 1.9	1.9	2.4: 2.4	More than normal	1.8	4.0	0
2001-04-26						4.0	0
2001-05-30	2.5: 2.1	1.8	2.2: 2.5	Normal	1.8	4.0	0
2001-07-05						4.25	0.25
2001-08-23						4.25	0
2001-09-17						3.75	-0.50
2001-10-15	2.8: 2.4	1.7	1.3: 2.2	Normal	1.7	3.75	0
2001-12-04	2.7: 2.1	2.0	1.2: 1.8	Normal	2.0	3.75	0

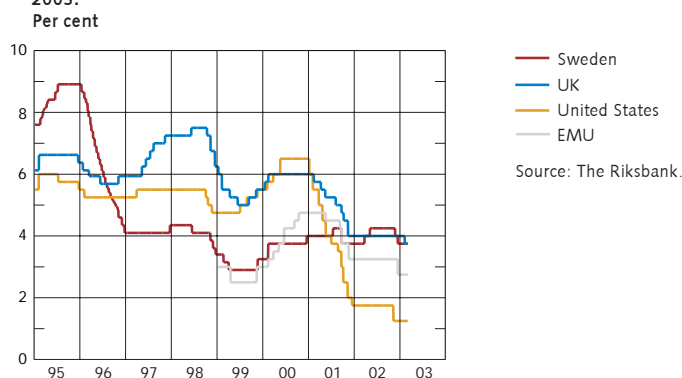
Note: Forecasts during the period were published only in the Inflation Report, which is issued four times a year. However, decisions on repo rate adjustments are not taken in conjunction with the publication of these reports only.

Source: The Riksbank.

would return to the target at the start of 2002, when the effects of a number of supply shocks had petered out. Expected GDP growth was relatively high in both 2000 and 2001 (until the autumn 2001). The repo rate was adjusted on four occasions during 2000 and 2001 for a net change of 0.5 percentage points.

The motivations that guide the Riksbank's monetary policy are discussed in detail in the minutes of the Executive Board meetings, and these are normally published approximately two weeks after the meetings. An examination of these minutes for the period in question shows that monetary policy was faced with somewhat different problems during 2000 and 2001. The main issue in 2000 centred on how much growth the economy could withstand before inflation would gather pace, i.e. how high resource utilisation was and how quickly potential production would grow. Another relevant issue here is that inflation for a long time had fallen short of both the inflation target and the Riksbank's forecasts. The situation in 2001 was practically the opposite. The most important

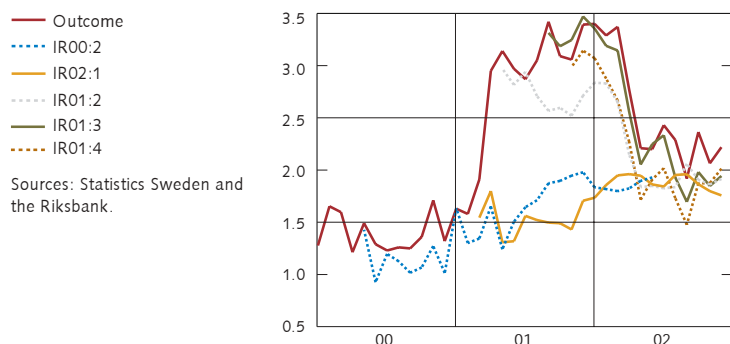
Figure B11. The repo rate in selected countries 1995-2003.



Source: The Riksbank.

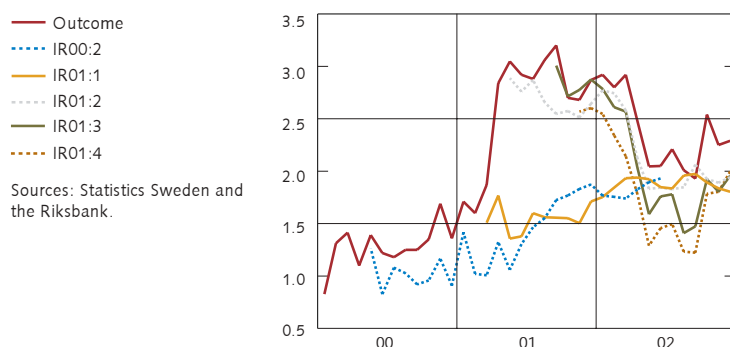
monetary policy question was what part of the rise in inflation was due to transitory effects of supply shocks and how much could be attributed to a more sustained increase because of greater resource utilisation and higher cost levels. Moreover, an analysis of inflation prospects in 2001 was complicated by unexpected negative developments, such as slackening international activity, falling oil prices, a weak krona and the terrorist attacks in the United States.

Figure B12. UND1X forecast paths and outcomes.
Percentage 12-month change



Sources: Statistics Sweden and the Riksbank.

Figure B13. CPI forecast paths and outcomes.
Percentage 12-month change



Sources: Statistics Sweden and the Riksbank.

Monetary policy in 2000

At the Executive Board's first monetary policy meeting of the new millennium in February 2000, it was concluded that growth in oil prices over the past year had contributed to gradually rising inflation. This raised the question of whether it was due to supply shocks or whether the rise was caused by greater international demand. The Executive Board's assessment was that the effect of oil prices on the general price level could not be disregarded completely. In addition it was concluded that monetary policy was sufficiently expansionary that there was a risk of inflation eventually exceeding the target. It was therefore decided to raise the repo rate by 0.5 percentage points.

At the monetary policy meetings held between March and October 2000, the Executive Board decided to leave the repo rate unchanged. These decisions were complex, however, and a risk was foreseen that inflation may exceed 2 per cent (Table B6). One particular complication was the high valuation of the stock market. Concern that this could fuel inflation played a significant part, particularly in the June discussions.

The minutes of the meeting show that one board member entered a reservation against the decision to leave the repo rate unchanged, proposing instead that the rate be raised by 0.5 percentage points. According to the minutes of the March meeting, the member's motivation for this proposal was that there was a higher inflationary propensity in the Swedish economy than that depicted in the Inflation Report, partly due to lower flexibility in the Swedish labour market. This could therefore soon lead to rising inflation, according to the board member, when unutilised resources in the Swedish economy were no longer available. However, the majority of the Executive Board members agreed with the picture of a stable, strong cyclical upswing in the Swedish economy, where an increasing amount of the economy's unutilised resources would be employed. Although there was an increase in resource utilisation during the period, the minutes of the October meeting contained the assessment that there was a higher degree of unutilised resources than was previously assumed. The low rate of inflation, among other things, supported this. Several board members therefore preferred to delay any potential rate rises, while also underscoring that there were many indications that a rise in the repo rate would eventually be required.

Autumn 2000 was marked by instability in the financial markets and poorer prospects for the international economy. At the monetary policy meeting in December 2002, the Executive Board concluded that fresh statistics indicated a slowdown in global activity. At the same time it was concluded that developments in oil prices and the exchange rate constituted greater upside risks for future inflation. All in all, inflation two years ahead was judged to be slightly higher than the target. In light of this the Executive Board decided to raise the repo rate by 0.25 percentage points.

Monetary policy in 2001

Spring 2001 was also characterised by complex monetary policy considerations, but this time of a different nature. Measured inflation exceeded the target, and the question was now what was causing it and what conclusions could be drawn in terms of monetary policy. The Riksbank's analysis indicated that the rise in inflation was temporary but also that a more sustained effect in connection with demand could not be ruled out. Furthermore, the exchange rate was weak. Inflationary pressure from supply shocks and the exchange rate were counteracted to some extent, however, by unexpectedly weak economic activity in the rest of

the world. During the first half of 2001 the Executive Board decided to leave the repo rate unchanged, despite the fact that the overall inflation forecast (i.e. taking into account the risk spectrum) spoke for a potential cut in interest rates in both March and May (Table R6). The considerable uncertainty, in particular over the strength of the inflationary tendencies in the economy, marked the assessment and was considered grounds to wait with such a decision.

The substantial weakening in the krona seen in early summer 2001 prompted the Executive Board to intervene in the currency market. The weak exchange rate was judged to constitute a risk of inflation two years ahead exceeding the bank's target, given that inflation was close to 3 per cent and that there were tendencies towards higher inflation expectations. All in all, the interventions in the currency market involved the Riksbank selling euro and USD for kronor to the amount of approximately SEK 12 billion between 15 and 25 June. One Board member entered a reservation against the currency interventions, arguing that the intervention process ought to have a more distinct connection to the Riksbank's strategy for inflation target policy so as not to raise question marks over the formulation of monetary policy. Short-term interest rates moved higher and prices in the money market indicated that market players were expecting the repo rate to be raised in July. At the July meeting the Executive Board decided to raise the repo rate by 0.25 percentage points, partly because of the weak exchange rate and partly due to signs that a high level of resource utilisation would lead to rising inflation even after the transitory effects of supply shocks had petered out. The rise in the repo rate resulted in a firmer krona and an easing of inflation expectations. Three Board members entered a reservation against the majority decision and maintained that the repo rate should be left unchanged. The members believed that the rise was inappropriate given the increasingly weaker economic picture.

As a result of the terrorist attacks in the United States, Autumn 2001 was marked by tremendous uncertainty as to the development of the global economy. In September the Executive Board decided to lower the repo rate by 0.50 percentage points following an extraordinary monetary policy meeting called in the wake of events in the United States. This move coincided with rate cuts in the United States, the euro area and a number of other countries.

In the months following the terrorist attacks, weak economic activity in the rest of the world was balanced by a continuation of high domestic inflationary pressure. In light of this, the Executive Board decided to leave the repo rate unchanged at its remaining monetary policy meetings in 2001. These meetings were also marked by great uncertainty as to the duration of the rise in inflation and it was therefore considered appropriate to take a cautious approach to monetary policy. One Board member entered a reservation against the decision to leave the repo rate unchanged at the December meeting. The member contended that there were more unutilised resources in the economy than assumed by the majority and that this justified a rate cut of 0.25 percentage points.

Has the Riksbank acted consistently?

One important question is whether the Riksbank's decisions were understandable given its forecasts. For example, how did the Riksbank act in relation to its simple rule of action of normally adjusting the repo rate on the basis of expected inflation one to two years ahead? It is also interesting to compare the Riksbank's policy with other simple but common rules, e.g. the Taylor rule. Common to these rules is that they postulate a systematic connection between interest rate decisions on the one hand and macroeconomic developments, and inflation in particular, on the other. Investigating whether a systematic relationship exists between the Riksbank's interest rate decisions and its forecasts is one way of analysing the consistency of interest rate policy. The Riksbank has for that matter emphasised that it does not apply its rule of action mechanically, but to the extent to which large deviations from a systematic rule can be shown it ought to be possible to find explanations for these deviations in the minutes of the monetary policy meeting.

The section entitled "Monetary policy and simple rules" compares the actual interest rate policy implemented by the Riksbank with the policy inferred by an application of some simple rules. The results indicate that the Riksbank has pursued a monetary policy that in general has been consistent and understandable in the sense that the calculated interest rate deviations have been relatively small (See Table B7 and Fig. B14). Figure B14 shows that the rate cut in September 2001 entailed an unusually low level of interest rates, although this originated from a situation of relatively high interest rates initially.

Monetary policy and simple rules

The original Taylor rule, applied by John Taylor to analyse the US Federal Reserve's monetary policy, was as follows:²⁶

$$r_t = r_0 + \alpha(\pi_t - \pi^*) + \beta(y_t - y_t^*)$$

Here r_t denotes the interest rate set by the central bank for a certain period (period t), π_t and y_t denote inflation and GDP respectively in the same period, π^* the inflation target, y_t^* a targeted level of GDP and r_0 the average interest rate (which is attained when the average targets for inflation and GDP are reached). Taylor made certain assumptions about the Fed's inflation target, the potential growth in GDP (the rate of increase in y^*) and the average interest rate (r_0), as well as about the parameters a and b in the rule of action. In order to enable a meaningful analysis of whether a certain central bank's interest rate policy can be described consistently using a simple rule such as Taylor's, it is important to make two adjustments in relation to the original rule. Firstly, it is important to allow the interest rate to even out to a certain degree over time, as all central banks appear to pursue an interest rate policy with considerably smaller rate fluctuations than the rules that do not allow this involve. Secondly it is necessary to estimate the rule using data from each country and not simply to apply the parameters chosen for the United States by Taylor.

Table B7 shows that if a variant of the Taylor rule had been followed consistently, the Riksbank would have implemented a slightly tighter monetary policy than that pursued during 2000 and 2001. This conclusion is based on a variant of the Taylor rule that was estimated using Swedish data and that was formulated as follows:

$$r_t = 0,25 + 0,81r_{t-1} + 0,42(\pi_t - 2) + 0,27y_t$$

Here y is more a denotation of GDP growth than the level of GDP. The rule has been estimated using data on the repo rate and the Riksbank's forecasts since 1993, and depicts how the bank's average policy can be described, given the assumption that the bank has followed a rule similar to Taylor's.

One rule that is somewhat closer in nature to the rule of action communicated by the Riksbank describes the repo rate as a function of the forecasts of inflation one to two years ahead (p_{t+1}^F and p_{t+2}^F), as opposed to inflation and GDP growth for the year in question. The rule is formulated as follows:

$$r_t = 1,33 + 0,48(\pi_{t+1}^F - 2) + 0,27(\pi_{t+2}^F - 2) + 0,66r_{t-1}$$

Compared with the interest rate levels implied by such a rule, the actual repo rate was relatively high during 2002, in line with the rule during the first half of 2001 and relatively low at the end of 2001.

Figure B14 shows the deviations between the actual repo rate and the interest rate levels produced when policy is described exactly by the estimated rules (i.e. the residuals from each regression equation). The interest rates used to calculate the deviations are those in Table B7.

Table B7. Repo rate calculations using different rules.

Forecast period	Taylor	Forecast-based rule	Actual repo rate
2000 Q1	3.74	3.18	3.75
2000 Q2	4.10	3.46	3.75
2000 Q3	4.06	3.53	3.75
2000 Q4	4.07	3.76	4.00
2001 Q1	3.98	3.95	4.00
2001 Q2	4.32	3.95	4.00
2001 Q3	4.11	3.78	4.25
2001 Q4	4.29	4.19	3.75

Note. Rules using estimated coefficients are taken from Berg, C. Jansson, P. & Vredin, A., (2002), "How useful are simple rules for monetary policy?", unpublished manuscript, The Riksbank, 2002. Inflation refers to CPI.

Source: The Riksbank.

²⁶ See Taylor, J.B., "Discretion versus Policy Rules in Practice", Carnegie-Rochester Conference Series on Public Policy 39, 1993, pp. 195 -214.

Evaluation of forecasting errors for 2002

Put simply, the Riksbank's monetary policy is based on adjusting the repo rate to ensure that forecast inflation meets the inflation target. If the inflation forecasts are accurate, the procedure ought to result in an actual inflation rate that is close to the target. In the event of large forecasting errors, however, there is a risk that inflation will deviate markedly from the target.²⁷

Figure B15 shows that UND1X inflation rose sharply during spring 2001 and exceeded the Riksbank's upper tolerance interval of 3 per cent, where it remained into the initial months of 2002. In order to understand the inflationary trend in 2002 it is necessary to also discuss parts of the course of inflationary events during 2001.

Large parts of the substantial price rises during spring 2002 were judged to be caused by supply shocks that have only transitory effects on inflation. A detailed discussion of this is presented in the appendix of the March 2002 Inflation Report.²⁸ The main features of the trend included an unexpectedly high rise in meat prices due to mad cow disease and foot and mouth disease. Electricity prices also rose more than expected, due in part to a normalisation that followed the sharp fall in prices after the deregulation of the market. Furthermore, weather conditions in Sweden and Europe during autumn 2001 contributed to higher prices for electricity as well as fruit and vegetables. Figure B16 shows UND1X inflation including and excluding the categories that were affected most by the supply shocks. Excluding these price increases, inflation nevertheless exceeded the Riksbank's forecasts and inflation target. One explanation could be that the economy had already reached a high level of resource utilisation beforehand. An indication of this is that unit labour costs were underestimated in 2001. On the other hand, a unanimous picture of resource utilisation and productivity for 2001 does not even exist today. The National Accounts are revised gradually. In light of the new information, the Riksbank has been forced to slightly revise its assessment of resource utilisation on several occasions in recent years. It appeared initially that the amount of unutilised resources had been underestimated in

Figure B14. Deviations from monetary policy rules.

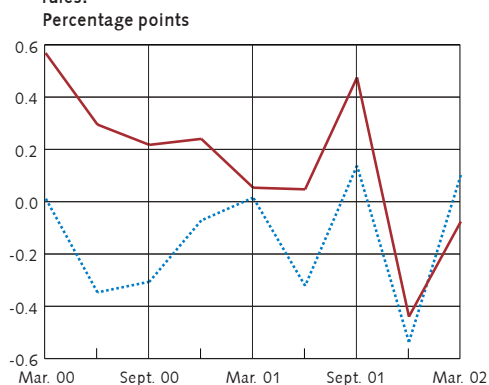


Figure B15. CPI and UND1X outcomes.

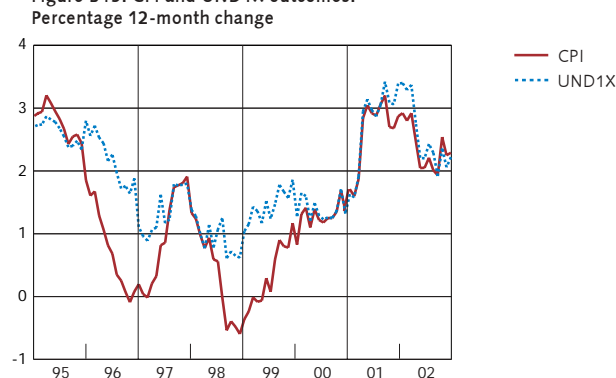
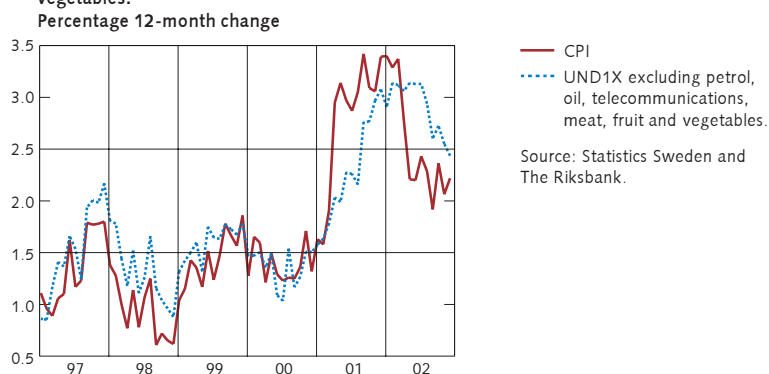


Figure B16. UND1X-including and excluding petrol, oil, telecommunications, meat, fruit and vegetables.

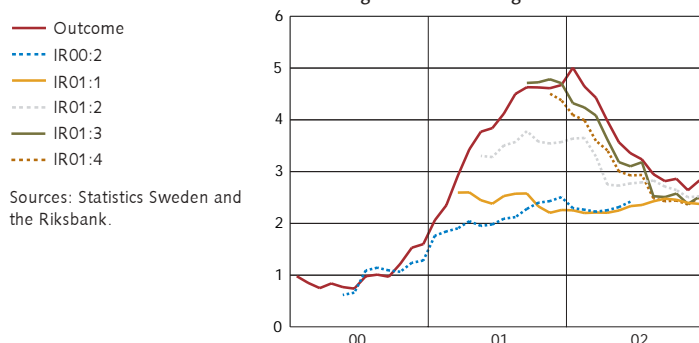


2001 and overestimated thereafter. The most recent figures point once again to an underestimation, i.e. that the first assessment was not unreasonable.

27 One complication here is that the Riksbank's forecasts differ from those of other forecasters through its assumption of a constant repo rate throughout the forecast period. This means that if the repo rate has been adjusted the forecasts should prove incorrect. There are various ways of dealing with this when performing evaluations. One is to quite simply disregard the assumption of a constant repo rate and evaluate the forecasts in the customary way. This approach seems more reasonable the smaller the repo rate adjustments have been during the period. Another is to attempt to make some kind of adjustment for the assumption. The text below gives an account of the first approach only, as simple adjustments to rules of thumb for the assumption of a constant repo rate have only a marginal effect on forecasts for the actual evaluation period. This in turn is due to the small nature of the repo rate adjustments.

28 See the appendix "Material for assessing monetary policy 1999-2001", in the March Inflation Report 2002.

Figure B17. UNDINHX forecast paths and outcomes.
Percentage 12-month change



Sources: Statistics Sweden and the Riksbank.

The rise in prices that occurred in spring 2001 continued to affect inflation outcomes during a number of months in 2002. Both CPI and UND1X inflation were underestimated that year by approximately 0.3 and 0.5 percentage points respectively on an average annual basis. Although these may not constitute major forecasting errors it is important to understand their cause. For example, large forecasting errors in one direction could be offset by errors in the opposite direction.

Attempting to discern the causes of forecasting errors is a very complicated process, although certain conclusions can nevertheless be drawn from Table B8. Domestic inflation was underestimated in 2002 which was partly due to price developments for rents and food. The underestimation of domestic inflation for 2002 (in the assessment in the December Inflation Report 2000) can also be

explained by the fact that fees for daycare centres were expected to be included in CPI in 2002; this never happened however. Otherwise a fall in inflation from the introduction of maximum fees for childcare would have been registered (Table B8). Another factor fuelling inflation in 2001 and 2002 was the unexpectedly large rises in unit labour costs during 2001, which were mainly a result of an overestimation of corporate sector productivity. Figure B17 shows a pattern in the forecasting errors in so far as the upward revisions of the forecast domestic inflation were made too slowly, thus entailing that forecast UND1X inflation was also revised upward too slowly.

Resource utilisation

An important issue for the Executive Board meetings during 2000 and 2001 was the level of resource utilisation in the economy and the inflationary pressure this may give rise to. An interesting question therefore is whether differences between the forecasts and outcomes for GDP growth and potential growth could be the reason for the slight underestimation of inflation in 2002.

Table B8 shows that the GDP assessments for 2001 that were made from the end of 2000 were overly optimistic. This did not apply to the Riksbank only, however, but also to most other forecasters (Figure 18).²⁹ It is only towards the end of 2001 that the forecasts contain errors of a reasonable size.

Table B8. Key variables: forecasts and outcomes 2001 and 2002.
Annual average

	IR 2000:4	IR 2001:1	IR 2001:2	IR 2001:3	IR 2001:4	Outcome
Forecasts for 2001						
GDP growth	3.4	2.4	2.2	1.3	1.2	1.1
GDP OECD growth 2001	3.0	2.2	2.0	1.0	1.0	0.9
Unit labour costs 2001, corporate sector	1.4	2.4	2.8	3.5	3.4	4.7
Forecasts for 2002						
Oil price USD	25.5	23.9	23.9	23.0	20.0	25.0
Exchange rate	121.0	123.7	125.6	138.6	133.8	133.7
Dollar exchange SEK/USD	8.4	8.4	8.3	9.1	10.0	9.7
International export prices	1.3	1.0	1.0	0.5	0.2	-0.4
Import prices, producers	-2.8	-2.3	-2.5	-0.8	-4.0	-0.2
Corporate sector wage costs	4.6	3.9	3.9	3.7	3.6	4.1
Corporate sector productivity	2.4	2.1	2.3	2.3	2.2	4.1
Unit labour costs, corporate sector	2.2	1.8	1.6	1.4	1.4	0.0
UNDINHx	2.0(2.5)	2.3	2.9	3.2	3.0	3.5
UNDIMPX	1.1	1.0	0.6	0.7	0.4	0.5
UND1X	1,8(2.1)	1.9	2.1	2.4	2.1	2.5
CPI	1,8(2.1)	1.9	2.1	2.0	1.8	2.4

Note. Unit labour costs are based on preliminary outcomes for productivity from the National Accounts. UNDINHx represents domestic inflation while UNDIMPX is imported inflation. The figures in parentheses show the forecasts exclusive of the maximum fees for childcare. The reason for this clarification is that childcare fees were originally expected to be included in the calculations of CPI.

Sources: Statistics Sweden and the Riksbank.

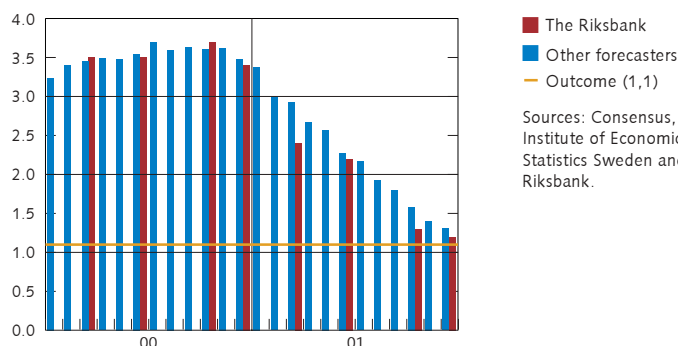
29 See Blix, M., Friberg, K. & Åkerlind, F., "An evaluation of forecasts for the Swedish economy", *Sveriges Riksbank Economic Review* 3, 2002, pp. 39-74.

There is, however, no simple correlation between GDP growth and inflation. Inflationary pressure is not determined by GDP growth in itself, but rather by the relationship between actual GDP and the potential production capacity in the economy, i.e. the output gap. If an overestimation of measured GDP is caused by an overestimation of potential GDP, this could result in an underestimation of resource utilisation and inflationary pressure. As stated above, analyses of these issues are complicated further by revisions of data.

Figure B19 shows that the Riksbank was not alone in underestimating inflation during 2002. Most participants seem to have expected an inflation rate at or just below the target up until the third quarter 2001, and no information in the expectations suggests a higher inflation rate than that forecast by the Riksbank. The same conclusions can be drawn for the inflation forecasts of other forecasters.³⁰ On the other hand, the majority of these were based on expectations of tighter monetary policy, although an analysis of expectations of the repo rate indicate that small rises were foreseen. One should also bear in mind that expectations of tighter monetary policy were probably based on a more optimistic view of economic activity than what later proved to be the case.

In conclusion the Riksbank underestimated inflation slightly for 2002. This was probably due in part to an underestimation of the effects of a number of specific supply shocks during spring 2001, but also because of the growth of unit labour costs, for example. As regards cost developments, a part of the forecasting error could possibly be a result of an underestimation of the economy's resource utilisation. The underestimation of inflation during 2001 in particular but also during 2002 should also be seen in the light of the Riksbank's previous overestimations of inflationary pressure on a number of occasions. Developments in the latter half of the 1990s indicated a more favourable relationship between growth and inflation than was witnessed in earlier periods, which the current discussion on the New Economy demonstrates.

Figure B18. GDP forecasts for 2001: Average for different forecasters and the Riksbank. Per cent



■ The Riksbank
■ Other forecasters
— Outcome (1,1)

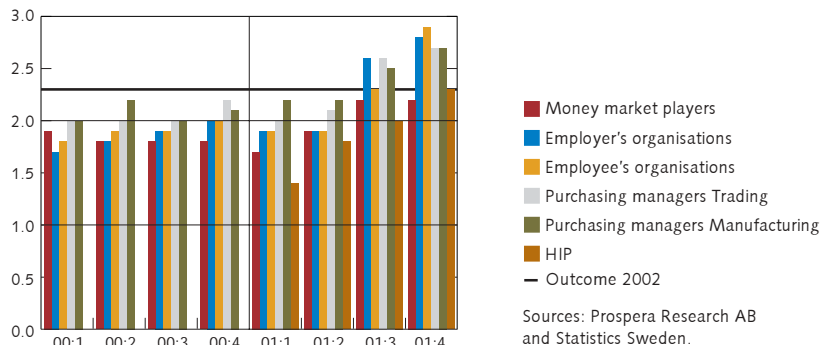
Sources: Consensus, National Institute of Economic Research, Statistics Sweden and the Riksbank.

Conclusions

Given that monetary policy works with a time lag, and with the aim of not contributing to large fluctuations in the real economy, the Riksbank has decided to base monetary policy on future expected inflation rather than observed inflation. Monetary policy during 2000 and 2001 appears consistent in light of the Riksbank's forecasts for 2002 and using the Riksbank's normal pattern of action as a standard. Meanwhile, a forecast-based rule of action would mean that forecasting errors could be of great significance in monetary policy.

Unusually large deviations from the inflation target were registered during 2001, the causes of which also had an impact on inflation in 2002. The Riksbank made an assessment in 2001 that this constituted a temporary rise in inflation, which proved to be largely correct. There were fears that the increase in inflation was partly attributable to excessive resource utilisation, and

Figure B19. Inflation expectations for 2002 during 2000 and 2001. Per cent



Sources: Prospera Research AB and Statistics Sweden.

³⁰ The only exception is Handelsbanken, which overestimated inflation by approximately 1 percentage point.

estimates of this were also revised upward during 2001 and 2002. Later figures, however, suggest that that the original assessments were not unreasonable. Revisions of historical data illustrate the difficulties inherent in assessing economic activity and forecasting inflation.

While the forecasts that guided monetary policy during the period 2000-2001 contained forecasting errors, they were nevertheless among the more successful when compared with other forecasters.³¹ The errors that were present the Riksbank's inflation forecasts appear to be derived, for example, from an underestimation of unit labour costs during 2001, mainly due to an unexpected development of production. Part of this forecasting error could be a result of an underestimation of the economy's resource utilisation and/or that excessively optimistic assumptions were made about the effects of resource utilisation on inflation.

Analyses performed by the Riksbank in 2000 and 2001 indicated that the economic climate would continue to be strong and that repo rate rises would therefore be required. Had the economic picture remained favourable, such rises would most certainly have been necessary. Instead the Riksbank implemented a number of minor rises, mainly to signify when inflation expectations had moved higher. In June and July of 2001, the picture was complicated further by the rapid and relatively sharp deterioration in the exchange rate. Following the events of 11 September 2001, and the resultant effect these had on views of future economic developments, the repo rate was lowered once again.

The minutes of the Executive Board's meetings indicate that the Riksbank was concerned by the high inflation outcomes during the period 2001-2002, but that the bank decided to follow its simple forecast-based rule of action: that it is primarily the assessment of inflation one to two years ahead that shall form the basis of monetary policy formulation. Had the Riksbank decided to base monetary policy on observed rather than forecast inflation, e.g. according to the Taylor rule, monetary policy would have been tighter during 2001 and 2002.

In conclusion, Sweden entered the period in question with relatively low instrumental rates compared with other countries. Furthermore, the instrumental rate was raised to a lesser extent in the initial stages of the same period. The backdrop to this was a very low rate of inflation, which had fallen short of the Riksbank's target for several years, and a positive assessment of the economy's capacity to grow while also keeping inflation down. When inflation rose at a faster rate than anticipated during 2001, question marks were raised over earlier assessments of the inflation propensity in the economy. Although the Riksbank judged most of the rise in inflation to be transitory, policy was based on a relatively high level of resource utilisation. Consequently, the repo rate was not lowered as much as in other countries during the period 2001-2002. Of relevance in this regard is that the krona was relatively weak during both 2001 and 2002, while fiscal policy was expansionary.

31 See Blix, M., Friberg, K. & Åkerlind, F., "An evaluation of forecasts for the Swedish economy", Sveriges Riksbank Economic Review 3, 2002, pp. 39-74.