Inflation Report

2006:2

20 June 2006

Contents

Foreword

The Riksbank gives its collective view of the inflation outlook in the Inflation Report. The Executive Board's monetary policy decisions and discussions are presented in separate press releases. Executive Board members may differ in their opinions on inflation prospects. The Board members' assessments and individual stances on monetary policy decisions are presented in the minutes of the Executive Board's monetary policy meetings. Any divergent opinions regarding the inflation outlook will thus be recorded in the separate minutes of the Board meeting on 19 June, to be published on 3 July 2006.

This Inflation Report reproduces the main features of the presentations and discussions at the Executive Board meetings on 7 June and 15 June. The purpose of the Inflation Report is not merely to produce background material for monetary policy decisions, but also to spread knowledge about the Riksbank's assessments. The Bank aims to make it easier for external parties to follow, understand and assess its monetary policy.

The analyses in the main scenario of this report are based on the assumption that the repo rate will develop in line with the financial markets' expectations, as reflected in implied forward rates. The forecasts extend three years ahead. It is important to point out that an interest rate path in line with forward interest rates should not be interpreted as the monetary policy assumption that the Executive Board considers most probable.

The Inflation Report begins with a box that provides an outline description of the goal and strategy of the Riksbank's monetary policy. This is followed by a summary of the report. In the subsequent sections, the Riksbank presents the key determinants of inflation and gives its collective assessment of inflation prospects in the main scenario and the key risks. The report also contains two boxes that analyse the level of the repo rate and the relationship between resource utilisation, cost levels and inflation.

Stockholm, June 2006
Stefan Ingves
GOVERNOR

Monetary policy in Sweden

This box provides a description of the goal and strategy of the Riksbank's monetary policy. The most important aim of this description is to explain how the Riksbank, when setting its interest rate, has scope to take into consideration developments in both inflation and in the real economy. A desirable monetary policy is characterised by inflation under normal circumstances being close to the inflation target in a two-year time perspective while at the same time the paths for inflation and the real economy do not exhibit excessively large fluctuations. The box is an extract from the document "Monetary policy in Sweden" which was published on 19 May 2006.[1]

- **The statutory objective of monetary policy is to maintain price stability.**
  This was established in the changes to the Sveriges Riksbank Act, which came into force in 1999. In the preparatory works for the Act, it was stated that the Riksbank, without prejudice to the price stability target, should furthermore support the goals of general economic policy with a view to maintaining a sustainable level of growth and a high rate of employment. These legislative changes also increased the independence of the Riksbank.

- **The Riksbank has specified an explicit inflation target according to which the annual change in the consumer price index (CPI) is to be 2 per cent with a tolerance interval of plus/minus 1 percentage point.**
  A relatively high level of consensus has been established internationally that an appropriate level of inflation is around 2 per cent. Countries with inflation targets have therefore often adopted targets that entail that inflation should be around 2 per cent. To emphasise that it is not within the power of monetary policy to continuously achieve the target exactly, the Riksbank has specified a tolerance interval around the target of plus/minus 1 percentage point. At the same time, this tolerance interval serves to underline that excessively large deviations are unacceptable if the target is to remain credible.

- **Monetary policy is also guided by various measures of "underlying inflation". There is no single measure of inflation that at each point in time indicates the proper stance of monetary policy.**
  A common denominator for these measures of underlying inflation is that they have been adjusted for price components that tend to fluctuate sharply but which are not judged to affect the trend rate of inflation. One such measure, UND1X, has been given a special status. In this measure the direct effects of changes in indirect taxes and subsidies as well as mortgage interest expenditure have been excluded. This measure is used because changes in indirect taxes and subsidies (due to fiscal policy) and in mortgage interest expenditure (due to monetary policy) often have effects on the CPI which should not give rise to any monetary policy response.

- **Monetary policy acts with a lag and is normally focused on achieving the inflation target within a two-year period. The two-year time horizon also provides scope for taking fluctuations in the real economy into consideration.**
  Permitting temporary deviations from the inflation target can be justified on the grounds of consideration to developments in the real economy (growth, unemployment, employment, etc.). By not aiming to restore inflation to target as quickly as possible, scope is created to conduct monetary policy in such a way as to dampen real economic fluctuations. At the same time, it is important that this flexibility does not diminish the long-term credibility of the inflation target. The two-year horizon can be interpreted as a restriction as to how much consideration can normally be given to real economic developments. In certain circumstances, deviations from the inflation target can be so large that it is reasonable to allow inflation to return to target beyond the normal two-year horizon. The Riksbank will

1 For the complete document, see http://www.riksbank.com/pagefolders/26054/Monetary_policy_in_Sweden.pdf.

make it clear in connection with the monetary policy decisions when it considers that a situation of this kind has arisen.

- **The Riksbank routinely takes into consideration changes in asset prices and other financial variables (exchange rates, house prices, share prices, household and corporate indebtedness, etc.) in monetary policy decisions.**
  This should not be interpreted as introducing targets for different asset prices or other financial quantities. However, situations may arise where the consequences for the real economy and inflation of the development of different financial variables threaten to become very unfavourable and serious without it being possible for that reason to quantify or capture this type of risk in the normal analytical and forecasting work. It may be necessary to take these risks into account in monetary policy decisions in a different way than in the normal approach, where the forecasts for inflation and the real economy for the next two years serve as the foundation. In practice, taking risks of this kind into consideration can mean that interest rate changes are made somewhat earlier or later, in relation to what would have been the most suitable according to the forecasts for inflation and the real economy. However, the aim is as always to maintain price stability and dampen fluctuations in the real economy.

- **The Riksbank's forecasts are constructed assuming the repo rate (the Riksbank's policy rate) develops in accordance with market expectations.**
  If inflation according to this interest rate assumption is expected to be close to target two years ahead, the market's expectations about future monetary policy can normally be regarded as reasonable. However, to determine this more definitely, consideration must be given to the whole future paths for inflation and the real economy. If, for instance, inflation increases very rapidly during all of the forecast period, and real growth is high, it is possible that the assumed interest rate path will not be considered reasonable, even though inflation is close to 2 per cent after two years. In this case, the assumed interest rate path probably means that monetary policy is too expansionary. This, in turn, can lead to unacceptably large fluctuations in real activity. A desirable monetary policy is characterised by inflation normally being close to the inflation target in a two-year time perspective while at the same time the paths for inflation and the real economy do not exhibit excessively large fluctuations.

- **Openness and clarity in monetary policy are prerequisites for the successful combination of credibility for the inflation target and a flexible application of the target in the short term.**
  The fact that the Riksbank has the task of specifying independently the price stability target and the considerations to be given in relation to other goals for economic policy in the short term also makes great demands on how these decisions are to be explained to the general public and to the Riksdag. The Riksbank's strategy for carrying out these tasks successfully is to be as clear and open as possible concerning the information and the considerations on which monetary policy decisions are based. The fact that the Riksbank has chosen to specify an exact target for inflation (with a certain tolerance interval) and the principle that inflation should normally be brought back to target within two years can both be justified by the aim of creating clarity and credibility for the inflation target. Explanations of and supporting data for monetary policy decisions are regularly commented on and published in Inflation Reports, minutes from monetary policy meetings, press releases, press conferences and in speeches given by members of the Executive Board. Further, the Governor of the Riksbank appears before the Riksdag Committee on Finance twice a year for a discussion on monetary policy. All this aims to facilitate reasonable expectations on future monetary policy being formed and external assessments of the Riksbank's previous monetary policy analyses and decisions.

Summary

Inflation has risen more than expected recently and is expected to rise further in the coming years. The assessment is that inflation will be close to two per cent a couple of years ahead. These forecasts are based on the assumption that monetary policy will gradually become less expansionary in the future. The rise in inflation is being subdued by the fact that the prices of imported goods are only rising marginally. Domestic inflation, on the other hand, is expected to rise relatively quickly in the future, due in part to a faster rise in domestic cost levels.

GDP growth in Sweden has been strong in recent years. The assessment is that growth will remain high this year and next year and that there will be a strengthening of economic activity. The rate of the upturn, however, is gradually slowing. International developments have been characterised by continuing high GDP growth and moderate price increases. Compared with the assessment in February, growth in the rest of the world is expected to be higher. The forecast for Swedish growth this year has been revised upwards marginally. However, the economic outlook for the coming years remains largely the same as in the February Inflation Report.

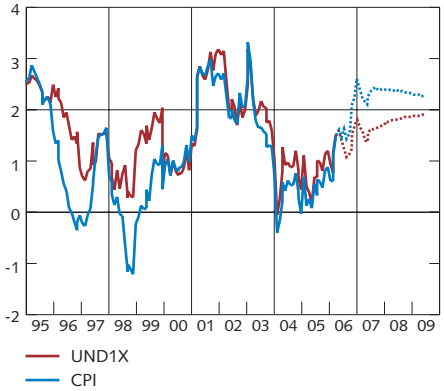
Slight increase in inflation in the future.

During the past two years, inflation in Sweden has been low, despite firm GDP growth and a substantial rise in oil and raw material prices. The low inflation can be attributed to several factors, including strong growth in productivity and higher imports from low-cost countries. This has led to low price rises or, in some cases, price reductions on goods other than energy. However, in the past year, inflation has started to rise. Moreover, inflation expectations have also been rising recently. The higher rate of price increases is to a certain extent due to rising electricity prices, although the prices of some import goods have also been raised at a faster rate than previously. On the other hand, domestic inflation, excluding electricity, has not risen at all this year. Compared with the assessment in the February Inflation Report, inflation has recently been slightly higher than expected, due primarily to unexpectedly large energy price increases.

The assessment is that inflation will fluctuate around present levels during the coming year and subsequently rise gradually. A couple of years ahead, inflation is expected to be in line with the inflation target of 2 per cent (see Figure 1). Imported inflation will remain low in the future, partly because oil prices and other raw material prices are falling, and partly because the downward price pressure on other imported goods will continue. On the other hand, domestic inflation will rise relatively quickly in the coming years (see Figure 2).

Last year, domestic cost pressures rose as a result of a slight slackening in productivity growth. In the coming years, it is assumed that domestic production costs will again rise at a slightly faster rate, as the economic climate improves and wage inflation rises. The higher cost pressures will gradually lead to a faster rise in domestic prices.

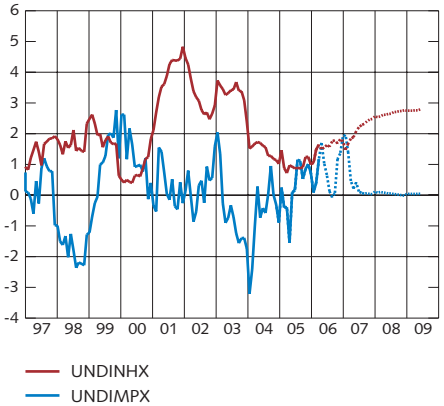
Figure 1. UND1X and CPI
Annual percentage change



Note. UND1X is CPI excluding household mortgage interest expenditure and adjusted for direct effects of changed indirect taxes and subsidies. The broken lines represent the Riksbank's forecasts.

Sources: Statistics Sweden and the Riksbank

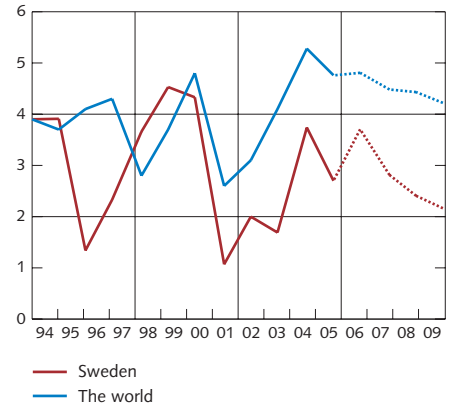
Figure 2. Domestic inflation (UNDINHX) and imported inflation (UNDIMPX)
Annual percentage change



Note. The broken lines represent the Riksbank's forecasts.

Sources: Statistics Sweden and the Riksbank

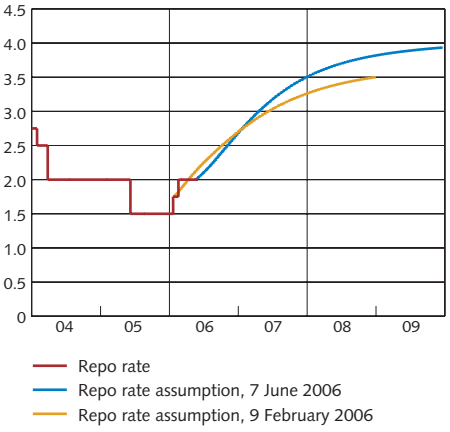
Figure 3. GDP
Annual percentage change



Note. The broken lines represent the Riksbank's forecasts.

Sources: IMF, Statistics Sweden and the Riksbank

Figure 4. Implied forward rates
Per cent



Note. Implied forward rates are calculated as a 15-day average.

Source: The Riksbank

■■ Improved economic activity.

GDP growth in Sweden has been strong in recent years. Last year, growth was close to 3 per cent and this year it is expected to be even higher (see Figure 3). The firming of economic activity is to a large extent due to strong international growth and to the fact that productivity growth has been high. Economic policy has also stimulated domestic demand. These factors will contribute to relatively high GDP growth next year as well, with the result that economic activity will continue to grow. However, growth will slow somewhat as investment growth is normalised in line with a historical cyclical pattern. It is also assumed that monetary policy will become less expansionary (see Figure 4). It is assumed that the repo rate according to the implied forward rates will be about 2.75 per cent at the end of this year and around 4 per cent at the end of 2009. Further, export growth will slacken when the economic upturn in the rest of the world slows.

There are several reasons to believe that GDP growth will be high this year. There was a strong outcome for the first quarter this year. Moreover, several other indicators suggest continued strong growth in the second quarter, e.g. monthly statistics on foreign trade with goods, manufacturing output, retail trade turnover and the National Institute of Economic Research's Business Tendency Survey. Labour market conditions also indicate that economic activity is continuing to improve. According to the labour force surveys (LFS), employment rose during the first four months of the year, compared with the corresponding period last year. Moreover, statistics from other sources, e.g. data on job vacancies and redundancy notices, indicate that the demand for labour will rise. The assessment is that employment will continue to rise as a result of improved economic activity and extended labour market programmes aimed at reducing unemployment. The labour force will also grow during the forecast period, which means that unemployment will fall relatively slowly.

■■ High rate of borrowing and low real interest rates.

There are also other factors which indicate continued strong GDP growth. Seen from a historical perspective, the increase in corporate and household borrowing is high, the money supply is growing at a very rapid rate and real interest rates remain low. Share prices have fallen recently among considerable volatility but still remain higher than the average for last year. At the same time, house prices have risen rapidly leading to a further increase in household wealth. This probably suggests that demand growth will remain strong. To a certain extent, this development is a result of the expansionary monetary policy. However, it is assumed that interest rates will gradually rise and the economic upturn will slow down. As a result, it is expected that lending and house prices will rise at a slower rate.

Interest rates have risen slightly in recent months but remain low. In the euro area and the United States, and similarly in Sweden,

the 10-year rate has all in all risen by about 0.5 percentage points since February. The rise is probably due to continued positive signals regarding economic activity. It is also possible that risk premiums have started to be normalised after being depressed for a long period.

■■ Strong growth in the rest of the world.

There has also been stronger economic activity in the rest of the world. In the United States, GDP growth was high during the first quarter of the year and indicators suggest that subsequent growth will also be relatively strong, albeit somewhat subdued. Persistently strong growth has also been noted in other countries, e.g. China. The upturn has now become more widespread as both the euro area and Japan are growing at a faster rate. Global GDP is expected to grow at a rate of between 4 and 5 per cent in the coming years. A relatively modest level of resource utilisation, in combination with falling raw material prices and continued high levels of international competition, means that inflation in the rest of the world will be relatively low.

■■ Minor changes in the inflation forecast.

The view on developments in the rest of the world is now more positive than in February. Global GDP growth is expected to be higher during the forecast period as the result of improved growth prospects for Asia. The assessment of Swedish export market growth has therefore been revised upwards. The oil price forecast has also been revised upwards in line with forward prices.

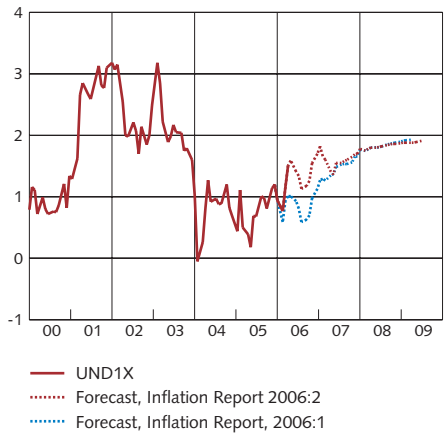
The forecast for Swedish growth for this year has been revised upwards marginally. There has also been some shift between the various components of demand. This year, the forecast for exports and investments have been revised upwards slightly, whereas household consumption and imports have been revised downwards. The economic outlook for the coming years remains largely the same as in the February Inflation Report.

Employment is now expected to rise at a slightly faster rate during the coming years. The assessment for the labour force has also been revised upwards. In the latter case, there are several reasons for this: the outcome was stronger than expected; account has been taken of a new seasonal pattern owing to changes in labour force survey data and employment has risen at a faster rate.

Unit labour costs are expected to be lower this year, but will on the other hand be higher next year. This is because certain collective charges will not have to be paid this year owing to a surplus in the system. These reductions will disappear next year, which means that the rate of increase for costs will be temporarily pushed up. This is not expected to affect inflation to any great extent, as the variations in costs are temporary.

In the short term, inflation in Sweden is expected to be slightly higher than the assumption made in February. This is mainly due to the fact that energy prices are rising at a faster rate than assumed at the time. For the coming years, the inflation forecast is largely unchanged.

Figure 5. UND1X
Annual percentage change



Sources: Statistics Sweden and the Riksbank

■■ Balanced risks.

As always, forecasts are uncertain and there is a risk that inflation does not develop in line with the main scenario. The risks in the assessment have applied for some time, for example the deficit in the US current account and the corresponding surpluses in other countries, the oil price, competitive pressure and wage trends. Some of these risks might lead to inflation being lower than in the main scenario and some may lead to inflation being higher. When these risks are taken together, the assessment is that the risks of inflation are balanced. When formulating monetary policy, risks associated with the high rate of increase in lending and house prices must also be taken into account.

Table 1. Inflation forecasts in the main scenario
Annual percentage change

	Annual average				12-month rate			
	2005	2006	2007	2008	June 06	June 07	June 08	June 09
CPI	0.5 (0.5)	1.5 (1.1)	2.3 (2.1)	2.4 (2.2)	1.5 (1.1)	2.3 (2.2)	2.4 (2.2)	2.3
UND1X	0.8 (0.8)	1.3 (0.9)	1.6 (1.5)	1.8 (1.8)	1.4 (0.9)	1.5 (1.5)	1.8 (1.8)	1.9
UNDINHX	1.0 (1.0)	1.5 (1.4)	2.1 (2.0)	2.7 (2.5)	1.6 (1.5)	2.1 (2.1)	2.6 (2.5)	2.8
UNDIMPX	0.2 (0.2)	0.6 (-0.4)	0.6 (0.2)	0.1 (0.3)	1.0 (-0.2)	0.4 (0.3)	0.1 (0.3)	0.0

Note. The figures in parentheses are the forecasts in the previous Inflation Report. UND1X is CPI inflation excluding household mortgage interest expenditure and the direct effects of changes in indirect taxes and subsidies. UNDINHX refers to prices of mainly domestically produced goods and services in UND1X. UNDIMPX refers to prices of mainly imported goods and services in UND1X.

Sources: Statistics Sweden and the Riksbank

Table 2. Key figures
Per cent and annual percentage change

Key figures	2005	2006	2007	2008	2009
GDP OECD 19	2.6 (2.5)	2.8 (2.5)	2.5 (2.5)	2.5 (2.6)	2.4
CPI OECD 19	2.3 (2.4)	2.3 (2.1)	2.1 (2.1)	2.0 (2.1)	2.0
Crude oil price Brent, USD/barrel, annual average	54.5	68.9 (63.0)	72.0 (61.7)	70.5 (60.2)	69.1
Market growth for Swedish exports	6.8 (5.9)	7.1 (6.1)	6.3 (5.9)	6.1 (5.9)	6.0
Exchange rate, TCW index, annual average	128.3 (128.3)	128.4 (127.4)	126.5 (124.5)	125.3 (122.9)	124.5
Repo rate, implied forward rate, annual average	1.7 (1.7)	2.1 (2.2)	3.1 (3.0)	3.7 (3.4)	3.9
10-year rate	3.4 (3.4)	3.9 (3.7)	4.5 (4.3)	4.9 (4.7)	5.1
GDP	2.7 (2.7)	3.7 (3.5)	2.8 (2.8)	2.4 (2.4)	2.2
Persons in employment	0.7 (0.7)	1.7 (1.5)	1.0 (0.6)	0.5 (0.2)	0.2
Open unemployment, per cent of labour force	5.9 (5.9)	5.5 (5.0)	5.1 (4.8)	4.9 (4.6)	4.8
Hourly wage in economy as a whole	3.2 (3.3)	3.4 (3.6)	3.9 (3.9)	4.1 (4.1)	4.1
Unit labour costs in business sector	1.4 (0.9)	0.2 (1.0)	2.9 (1.7)	2.0 (2.0)	2.0
Public financial saving, percentage of GDP	2.8 (2.0)	2.2 (1.5)	2.0 (1.0)	2.1 (1.2)	1.9

Note. The figures in parentheses are the forecasts in the previous Inflation Report.

Sources: Swedish National Labour Market Board, Intercontinental Exchange, National Mediation Office, OECD, Statistics Sweden and the Riksbank

Determinants of inflation

The financial markets

Since the February Inflation Report, developments in international financial markets have been characterised by a rise in long-term interest rates. However, they are still low seen from a historical perspective. The implied forward rates, on which the assumptions regarding the repo rate in this Inflation Report are based, have risen towards the end of the forecast period compared with those used as the basis in the February Inflation Report.

Share prices have been very volatile recently and have fallen overall both in Sweden and internationally since the February Inflation Report. Corporate and household borrowing continue to rise at a high rate as well as house prices.

■■ Higher implied forward rate at the end of the forecast period.

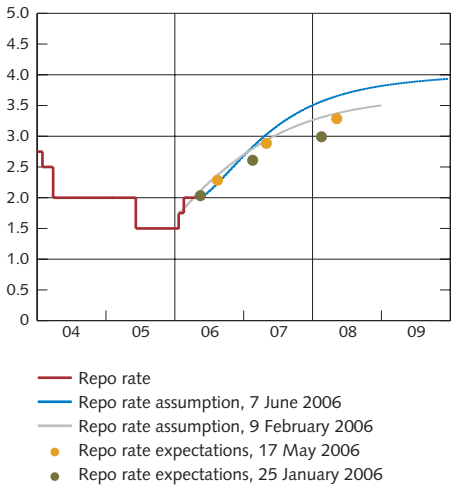
As in previous inflation reports, the forecasts are based on the assumption that the repo rate will develop in line with implied forward rates. A 15-day average of forward rates up to 7 June has been used to reduce the effect of temporary fluctuations in pricing in the financial markets. Compared with the average implied forward rates used in the February Inflation Report, the current forward rate is marginally lower in 2006, but around 0.10 percentage points higher, seen as an average for 2006-2008 (see Figure 6). The implied forward rates are approximately 2.75 per cent at the end of this year and just under 4 per cent at the end of 2009. The expectations measured in surveys on 17 May have also risen since January, although they are still lower than the implied forward rates 1-2 years ahead (see Figure 6).

In the United States the Federal Reserve has continued to raise its key rate (Fed funds), which is now at 5 per cent. Since the February Inflation Report, forward rates have risen in the United States, which indicates that a further slight increase in the US key rate is expected in the coming months (see Figure 7). The key rate in the euro area (the refi rate) has been raised to 2.75 per cent. The implied forward rates indicate that the refi rate is expected to be increased more than previously in the period ahead (see Figure 7).

■■ Rising long-term interest rates.

Long-term interest rates have risen since the February Inflation Report, although the recent stock market turbulence has contributed to a slight fall (see Figure 8). In the euro area and the United States, and similarly in Sweden, long-term interest rates have risen by about 0.5 percentage points during the period. Continued positive signals on economic development, rising oil prices and expectations of a tighter monetary policy are the foremost explanations for the increase in long-term interest rates and implied forward rates. This year's rise in interest rates may also be connected with the normalisation of the globally low risk premiums that has taken place.

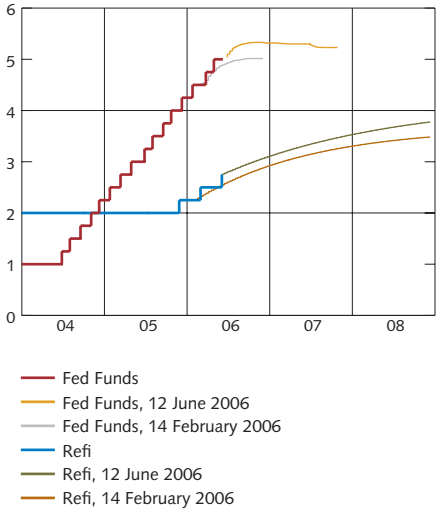
Figure 6. Implied forward rates and repo rate expectations
Per cent



Note. Implied forward rates are calculated as a 15-day average. Repo rate expectations according to Prospera's surveys.

Sources: Prospera Research AB and the Riksbank

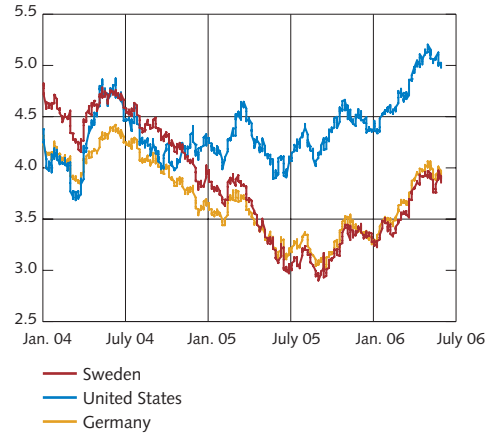
Figure 7. Monetary policy expectations in the euro area and the United States
Per cent



Note. Expectations calculated according to implied forward rates for the euro area and Fed funds contracts for the United States.

Source: The Riksbank

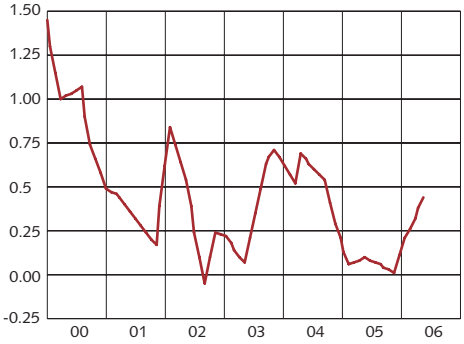
Figure 8. Long-term interest rates
Per cent



Note. Yields on 10-year government bonds.

Source: The Riksbank

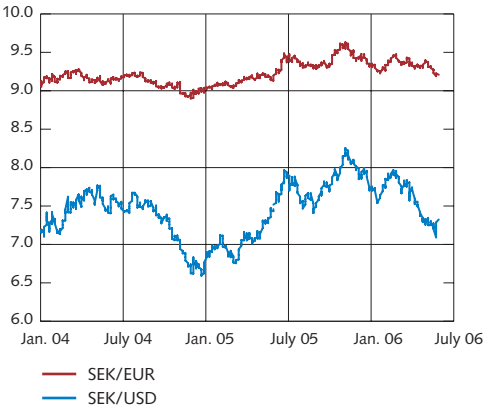
Figure 9. Risk premiums in Sweden
Percentage points



Note. The risk premium is calculated as the difference between implied forward rates and survey expectations according to Prospera 2 years ahead.

Sources: Prospera Research AB and the Riksbank

Figure 10. Exchange rate developments



Source: The Riksbank

Surveys provide concrete estimates of the market agents' expectations regarding the future repo rate. They can therefore be used to separate the implied forward rate into the expected repo rate and the risk premium.[2] After having been very small during 2005, the difference between survey responses and the implied forward rates has increased during the year, which indicates an increased risk premium (see Figure 9).

As previously, a continued rise in long-term interest rates is forecast in Sweden. This assessment is based on the assumption that economic activity will continue to increase and a continued normalisation of the low-risk premiums. The unexpectedly large rise in interest rates since February has led to a slight upward adjustment of the long-term interest rate forecast for Sweden in relation to the February Inflation Report. During 2006-2008, the 10-year rate is expected to be approximately 0.2 percentage points higher than previously. The revision is about the same size for every year.

■■ The krona has strengthened slightly against the dollar.

The dollar has weakened against the euro among other currencies since the previous Inflation Report. This can be related to a smaller expected interest rate differential between the United States and the euro area and concern about the large US current account deficit. The krona has strengthened against the dollar and, to a lesser extent against the euro (see Figure 10). In terms of the competitiveness-weighted TCW index, on average, the krona has appreciated approximately in line with expectations in the February Inflation Report (see Figure 11).

As before, the krona is expected to appreciate during the forecast period. A strong external position and good relative growth prospects tend to go hand in hand with a stronger real exchange rate. Sweden's strong external position and good growth prospects in relation to other countries are accordingly factors that suggest a strengthening of the real exchange rate for the krona. Given that inflation within and outside Sweden will be about the same, the nominal exchange rate is also expected to appreciate.

However, the krona is expected to strengthen to a slightly lesser degree than in the February Inflation Report (see Figure 11). This is particularly related to uncertainty about the development of the external position and thus the real exchange rate.[3] It is possible that the external position is not as strong as was previously assumed, which suggests a more moderate appreciation of the exchange rate than previously forecast. At the end of 2009, SEK/TCW is expected to appreciate by around 4 per cent compared with the outcome for the first quarter this year.

2 See also Alsterlind, J. & H. Dillén,"Monetary policy expectations and forward premia", *Sveriges Riksbank Economic Review* 2005:2.

3 See also How do large current-account surpluses co-exist with a weak international investment position?" Blomberg G and M. Falk, *Sveriges Riksbank Economic Review* 2006:1.

■■ Falling share prices around the world.

Prices on the world's stock exchanges have been very volatile recently. Share prices have fallen both in Sweden and internationally since the February Inflation Report (see Figure 12). From the turn of the year until the end of April, the Stockholm Stock Exchange showed very strong growth.

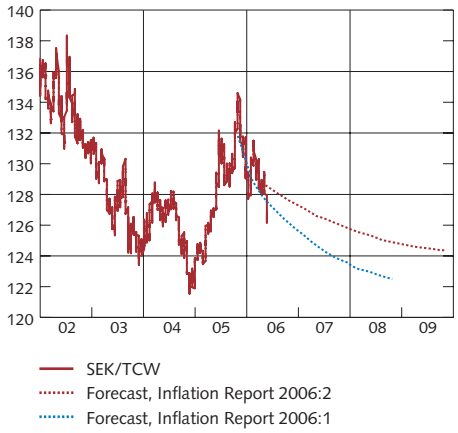
The question now is whether the recent stock market decline represents a downward turn in world stock exchanges or if it is a more temporary adjustment in level. Share indexes in Sweden have risen very sharply in the past three years. At the same time, there has been a very substantial increase in corporate profits. P/E ratios, that show share prices in relation to earnings per share, have thus been relatively constant since 2004 (see Figure 13). In this respect, developments over the past few years differ significantly from the situation around the turn of the millennium when share prices also rose sharply. The valuation in relation to both profits and the share price index is now considerably below the levels for 2000. Furthermore, the global economic outlook remains favourable. There is a lot to suggest that the recent fall on the stock market is not the start of a sharp correction such as occurred in 2000-2003. The recent development might rather be said to reflect an enhanced awareness of risk in the financial markets. The assessment of the development of the real economy is based on the assumption that stock market prices in Sweden will not continue to rise as sharply as they have in recent years but more in line with long-term historic averages.

■■ Borrowing and house prices are increasing sharply despite rising interest rates.

Borrowing by the Swedish public is continuing to increase rapidly. The slowdown in the rate of increase for corporate borrowing in January proved temporary; in April the annual growth was just over 12 per cent (see Figure 14). Household borrowing also continued to rise sharply, at an annual rate of over 13 per cent in April. This can be compared with the average since 1996 of around 8 per cent. House prices are also continuing to rise rapidly. In Q1 this year prices were approximately 13 per cent higher than in the corresponding quarter last year (see Figure 15). House prices have shown an average rate of increase similar to that for household borrowing since 1996. Both household borrowing and house prices are thus continuing to show rates of growth above historical levels which do not appear to be sustainable in the long term (see Figure 15).

The rate of growth in the broad money aggregate M3 has increased sharply in Sweden in the past two years (see Figure 16). In April, the increase was around 18 per cent on an annual basis. The narrow money aggregate M0, which mainly consists of the Swedish public's holdings of banknotes and coins, has risen at a considerably slower rate.

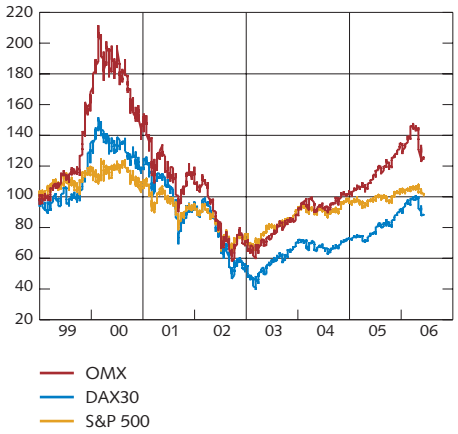
Figure 11. Competition weighted TCW exchange rate
Index, 18 November 1992 = 100



Note. Outcome represents daily rates and forecasts refer to quarterly averages.

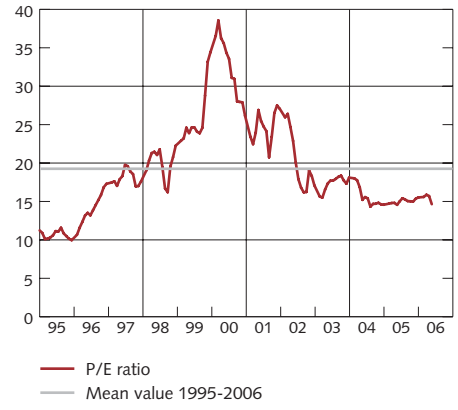
Source: The Riksbank

Figure 12. Share index in Sweden, the United States and Germany
Index, 1 January 1999 = 100



Source: Reuters EcoWin

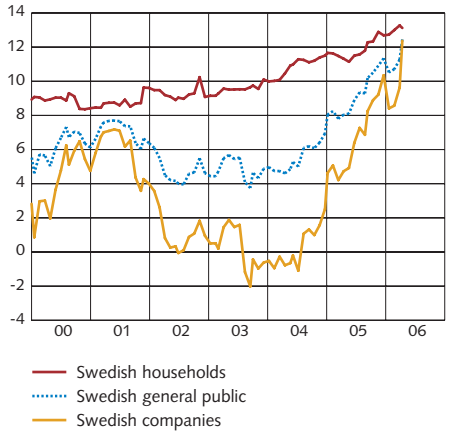
Figure 13. P/E ratios for the Stockholm Stock Exchange



Note. P/E ratios are calculated on expected profits.

Sources: OMX, JCF and the Riksbank

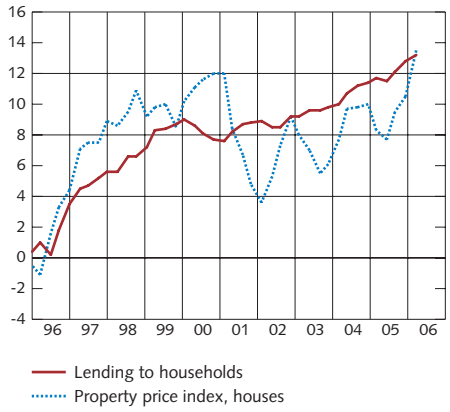
Figure 14. Credit institutions' lending to the general public, by sector
Annual percentage change



Note. Owing to a change in the reporting system, some adjustment has been made to the figures from Statistics Sweden.

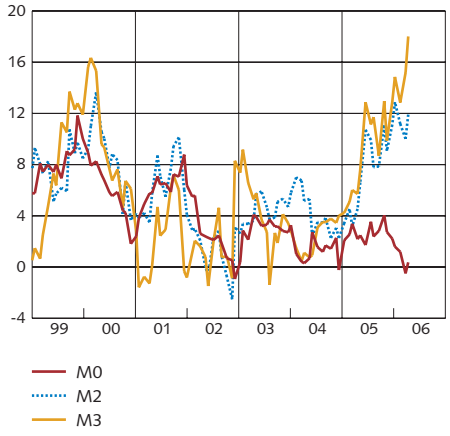
Sources: Statistics Sweden and the Riksbank

Figure 15. House prices and total lending to Swedish households
Annual percentage change



Source: Statistics Sweden and the Riksbank

Figure 16. The money supply
Annual percentage change



Source: Statistics Sweden

New definition of the supply of money

The supply of money is the amount of liquid assets in circulation. There are several measures of the supply of money that differ with respect to how narrow the definition of liquid assets is. As from January 2006, the Riksbank's measures of the supply of money – M0, M1, M2 and M3 – have been substantially harmonised with the ECB definitions. One difference compared to the previous definitions is that these measures include liquid assets issued not only by banks but also liquid assets issued by other financial institutions that provide credit and receive deposits, commonly termed Monetary Financial Institutions (MFIs).

M0 is the most liquid measure consisting of banknotes and coins in circulation.

M1 is the same as M0 with the addition of demand deposits from the Swedish public in Swedish MFIs and the National Debt Office. Demand deposits are defined as overnight deposits and deposits in transaction accounts.

M2 is the same as M1 with the addition of deposits, subject to certain restrictions, by the Swedish public at Swedish MFIs and the National Debt Office. Deposits subject to certain restrictions consist of deposits redeemable at notice of up to 3 months or with a maturity of up to 2 years.

M3 is the same as M2 with the addition of money market fund unit/shares and debt securities with a maturity of up to 2 years issued by Swedish MFIs and certain types of secured short-term loans ("repurchase agreements").

Put simply, it can be said that M2 corresponds to the former definition of M3.

For some time now, the rate of increase of M3 has accelerated and in April M3 increased by 18 per cent. More than 7 percentage points of the increase can be explained by the increase in the Swedish public's holdings of securities issued by MFIs, shares in money market funds and repurchase agreements. Development of these aggregates is very volatile. Unlike M3, M0, which consists of banknotes and coins, continues to develop modestly, by approximately 0.4 per cent in April. M2, and likewise M3 according to the previous definition, increased by around 12 per cent. This is primarily due to an increase in short-term deposits.

Short-term deposits account for around 75 per cent of M2, and largely consist of deposits from households and firms. Household deposits increased by approximately 10 per cent in April. This is a high rate of increase but is in line with developments in 2001 and 2002. The rate of increase of corporate deposits has been high for some time although hardly remarkable in a historical perspective. However, the present situation differs in that the rate of increase is accelerating both for households and for non-financial companies at the same time. Previously, the increase in household deposits was relatively low when corporate deposits increased rapidly and vice versa.

The substantial growth in the supply of money is thus mainly due to two factors. One is that a greater number of more volatile components are included in the new definition of M3. However, even adjusted for these effects, the supply of money shows a high rate of increase which is largely due to the increase in short-term deposits by households and firms.

■■ An increasing real interest rate is expected to dampen the rate of increase in household borrowing and house prices.

The nominal long-term rates have risen since last autumn. Inflation expectations in the long term have remained stable for several years at around 2 per cent. This means that real long-term rates have also increased (see Figure 17). Inflation expectations in the short term vary to a greater extent with the outcomes of inflation and have in recent years been less than 2 per cent. The fact that the repo rate has been unchanged since February, at the same time as short-term inflation expectations have been revised upwards, therefore means that the real short-term rate has fallen slightly in the past few months (see Figure 17). It is assumed in this Inflation Report that the repo rate will be gradually increased. The Riksbank also expects long-term nominal rates to increase during the forecast period. A development towards more normal interest rate levels in real terms as well can be expected to curb rising house prices and household borrowing.

The real exchange rate of the krona has been relatively stable for the past year, albeit at a considerably weaker level than during 2003 and 2004 (see Figure 17). This weakening is due to inflation in Sweden having been lower than in other countries, at the same time as the krona has weakened in nominal terms. The Riksbank expects the krona to strengthen both nominally and in real terms in the coming years.

All in all, the financial conditions in Sweden can still be characterised as being very expansive. Low real interest rates and a relatively weak krona stimulate economic activity. There continues to be strong growth in corporate and household borrowing and the supply of money is increasing rapidly. All in all, this suggests strong demand growth in the period ahead, even if the Riksbank expects the expansive conditions to be dampened during the forecast period.

Figure 17. Real interest rates and real TCW-weighted exchange rates
Per cent and index, 18 November 1992 = 100

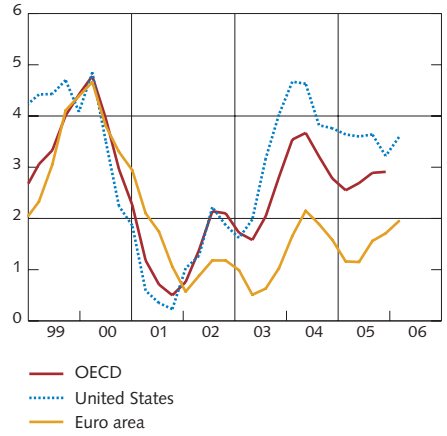
Note. When calculating real interest rates, inflation expectations have been taken from the National Institute of Economic Research's HIP surveys for the 3-month rate, and from Prospera's surveys for the 5-year rate. The interest rates refer to treasury bills with 3 months to maturity and treasury bonds with 5 years to maturity.

Sources: The National Institute of Economic Research, Prospera Research AB and the Riksbank

Revised forecasts since the February Inflation Report

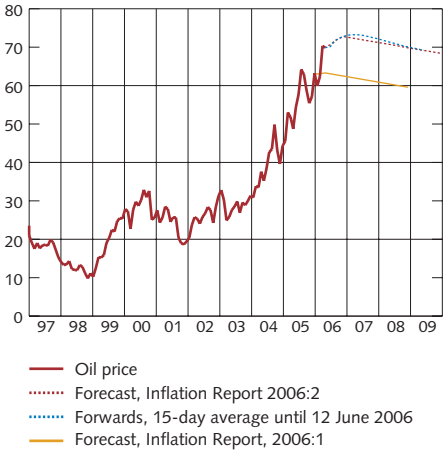
- The implied forward rates are slightly lower in 2006 but around 0.1 percentage points higher when expressed as an average for 2006–2008.
- The Swedish long-term rate is expected to be around 0.2 percentage points higher in 2006–2008 than in the February Inflation Report.
- The forecast for SEK/TCW is revised in a slightly weaker direction. The new forecast means that the krona is expected all in all to appreciate by around 4 per cent from today's level until the end of 2009.

Figure 18. GDP
Annual percentage change



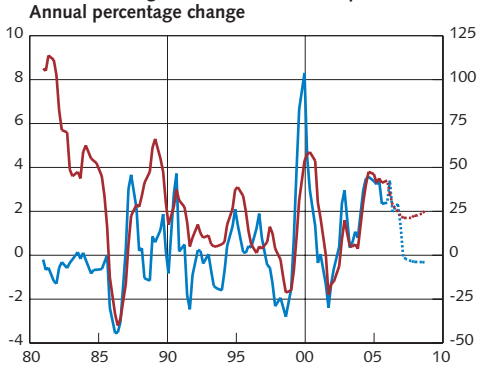
Sources: Eurostat, OECD and the US Department of Commerce

Figure 19. Oil price, Brent crude
USD per barrel



Sources: Intercontinental Exchange and the Riksbank

Figure 20. International producer prices for manufactured goods and oil and metal price index
Annual percentage change



Note. The broken lines show the Riksbank's forecasts and forwards for the oil and metal price index respectively.

Sources: Intercontinental Exchange, London Metal Exchange, OECD and the Riksbank

International developments

International economic activity has continued to show strong growth as the result of rapid growth in Asia, favourable developments in the United States and a modest upturn in the euro area. It is predicted that global GDP growth will remain strong in the period to come. The forecasts for international GDP growth and market growth for Swedish export goods have been revised upwards considerably compared with the February Inflation Report.

Rising raw material and energy prices have contributed to higher global inflation. However, energy and raw material prices are expected to fall slightly in the future and international competition is expected to continue to have a dampening effect on consumer price inflation.

■■ Positive growth in the rest of the world.

International economic activity has shown strong growth in recent years. The strongest rate of growth has been in Asia, where in the last two years the Chinese economy has grown by about 10 per cent and the Indian economy has grown by about 8 per cent on average per year. There has been an economic recovery in Japan after a long period of relatively weak development. GDP growth in the United States was subdued last year at 3.5 per cent. However, growth remains high compared with other industrial nations and the US economy, also by virtue of its size, remains an important driving force for global economic activity. In the euro area, economic activity has been subdued in recent years, but signs of improvement have been discernible for some time. Economic activity in the United Kingdom and the Nordic countries continues to contribute positively to the growth of Swedish exports. There have also been favourable developments in economic activity in Russia, eastern Europe and the Middle East. The contribution made by emerging markets to global economic activity has risen, while the growth in established industrial nations overall in recent years has only marginally exceeded the average rate since the end of the 1980s.

■■ The oil price has continued to rise.

The oil price has risen by just over 10 dollars per barrel since the February Inflation Report (see Figure 19). Forward prices have also risen. At the same time, stock levels in the United States are normal and the International Energy Agency (IEA) has not made any major revisions of its forecasts regarding the world supply and demand for oil. The recent price rise is probably related to supply factors such as concern over future oil production in Iran and Nigeria.

■■ Low but rising global inflation.

Inflation is low in the rest of the world, but there is concern that high energy and raw material prices will eventually affect underlying inflation. Last year, for example, international producer prices rose rapidly as the result of the price rises for oil and raw materials (see Figure 20). Most recently, underlying inflation has risen in the United States (see Figure 21). Underlying inflation has even risen in the euro area recently, albeit from a lower level. CPI inflation has over the past year mostly been higher than the monetary policy target (see Figure 22).

As the same time as there have been price rises for oil and raw materials, stiffer competition from Asian low-cost countries, among others, has exerted downward pressure on the prices of other goods. These effect of globalisation have, at least in part, counteracted rising energy prices at a time when international economic activity has been firm.

The rate of price increase for producers and consumers is expected to decline during the forecast period as the oil price and prices of other raw materials are expected to fall somewhat. International producer prices rose by 3.4 per cent last year, a rate of growth that is expected to fall to 2.6 per cent this year. This means that producer prices are expected to rise slightly more compared with the February Inflation Report. The upward revision is the result of new higher outcomes and the fact that the prices of oil and some raw materials are expected to be higher in the future.

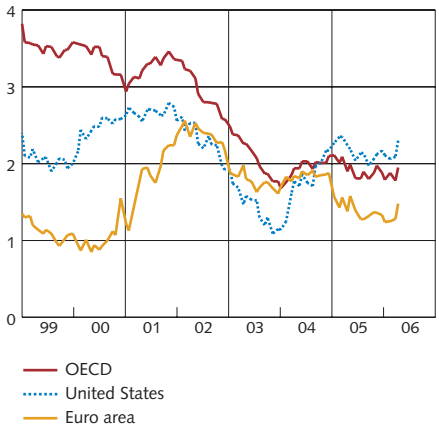
■■ Growth driven primarily by increased trade and favourable financial conditions.

The growth rate for the global economy is expected to remain high during the forecast period and only slacken slightly in the future. The driving forces are a continued process of globalisation with increased international trade and favourable financial conditions such as rapid credit growth and improved balance sheets in the corporate sector. Interest rates are expected to rise but remain relatively low. Employment is expected to rise in all major regions. Investment activity in the global economy is also remarkably high and will contribute to both higher output and demand (see Figure 23). Global GDP growth has been revised upwards during the forecast period, which is in line with other analysts' forecast revisions. Above all, the economic performance in Asia is now expected to be stronger than previously forecast.

■■ Strong Swedish export market growth this year and the years to come.

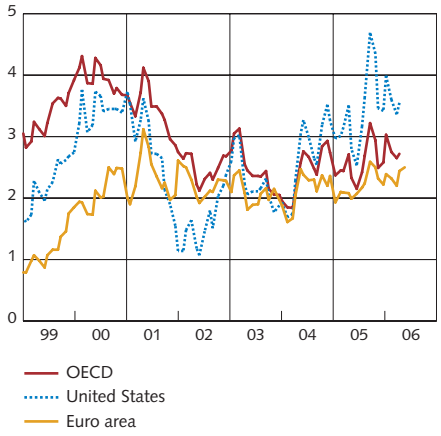
Imports of goods in the major recipient countries for Swedish exports rose unexpectedly sharply at the end of last year. Imports rose

Figure 21. CPI excluding energy and food
Annual percentage change



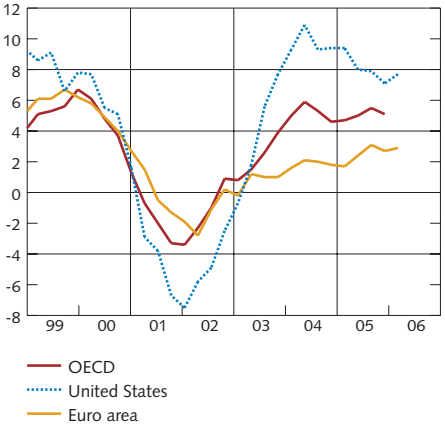
Source: OECD

Figure 22. CPI
Annual percentage change



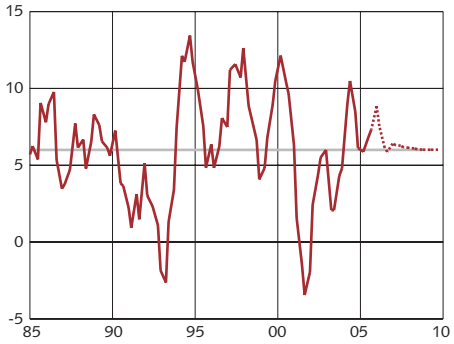
Source: OECD

Figure 23. Investments
Annual percentage change



Sources: Eurostat, OECD and the US Department of Commerce

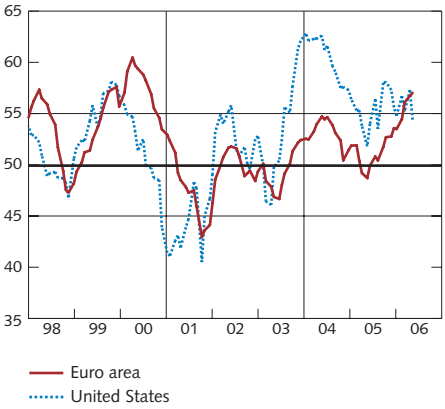
Figure 24. Market growth for Swedish exports
Annual percentage change



Note. Aggregate of real goods imports in the countries that comprise Sweden's export market.

Sources: National sources and the Riksbank

Figure 25. Purchasing Manager Index in manufacturing
Index, unchanged activity = 50



Sources: Institute for Supply Management and NTC Research Ltd.

sharply in the Nordic countries and the United Kingdom, among others. Higher growth in other areas of the global economy is also contributing to higher demand for Swedish export goods.

In the light of the fact that the global economy and international trade are expected to continue to grow at a strong rate, Swedish export market growth is expected to continue to show favourable development (see Figure 24). This year, it is expected to rise by just over 7 per cent before later softening to a growth rate of just over 6 per cent.

■■ Indications that US economic growth will slacken at a slightly faster rate.

Between the fourth quarter of last year and the first quarter of this year, US GDP growth was around 1.3 per cent, or 5.3 per cent in annualised terms. This growth rate was slightly higher than the Riksbank's forecast in the February Inflation Report and warrants a revision upwards of the forecast for 2006. There was strong growth in both private consumption and corporate investment. A substantial increase in corporate profits means that companies can continue to increase their investment.

At the same time, the latest economic statistics indicate that the economy has been subdued somewhat. The situation in the labour market continued to improve in April and May, albeit at a slower rate, and the purchasing managers' index in both manufacturing and services fell in May. However, the purchasing managers' index remains at levels that indicate continued growth.

Other factors that are expected to contribute to slower economic development are the high oil price and a certain degree of slowdown in housing prices over the past year. The growth of households' real disposable income has also been subdued recently. Up until now, households have largely compensated for this by a reduction in saving and increased borrowing.

All in all, it is predicted that the US economy will grow by 3.4 per cent this year, which means that resource utilisation is expected to continue to rise. In the future, the growth rate is expected to be around 3 per cent per year.

■■ Continued improvements in economic activity in the euro area.

Confidence in the corporate sector in the euro area is relatively high and the most recent indicators, e.g. in terms of the purchasing managers' index for manufacturing, suggest continued positive growth (see Figure 25).

Growth in the euro area firmed at the beginning of the year. After having risen by 0.3 per cent during the fourth quarter last year compared with the preceding quarter, GDP rose by 0.6 per cent in this year's first quarter. This was slightly higher than in the assessment made in the February Inflation Report and in line with those indications of slightly stronger growth given in the latest Business

Tendency Surveys and household surveys. Industrial output showed an upturn in March. Household consumption rose rapidly during the first quarter after weak growth towards the end of last year. Last year's weakening of the euro and the continued favourable financial conditions are also stimulating growth.

In Germany, GDP rose by 0.4 per cent in the first quarter compared with the preceding quarter. The proposed VAT increase in Germany in January 2007 remains a source of uncertainty in the forecast. Analysts' estimates of the effects on consumption and growth vary significantly. Most agree that the VAT increase will lead to lower consumption growth next year compared with this year. The Riksbank agrees with this assessment and predicts that the rate of growth in Germany will be lower next year than the assumption made in the February Inflation Report. Meanwhile, opposition to the idea of a VAT increase in Germany appears to have become more widespread and it is therefore uncertain whether there will actually be any increase.

Even though unemployment in the euro area has fallen in recent years, resource utilisation is still regarded as being relatively low. GDP growth is expected to be around 2 per cent both this year and in the coming years, and resource utilisation is expected to rise at a slow pace. It is assumed that monetary policy will be conducted in a less expansionary direction. Compared with the forecast in the February Inflation Report, it is assumed that the tightening of monetary policy will take place rather more quickly.

■■ Continued strong economic performance in Asia.

GDP growth in China reached an annual rate of around 10 per cent during the first quarter. This growth continues to be driven primarily by investment and exports. Growth in household consumption, however, remains more subdued. Annual rates of CPI inflation have been negative during the spring as a result of falling prices for, among others, food and clothing. Most recently, however, the price fall has been subdued.

In Japan, economic activity has continued to improve after a long period of low growth. According to preliminary statistics, GDP growth was subdued during the first quarter this year compared to the fourth quarter last year. Much of this slowdown is related to the fact that foreign trade and stockbuilding made a significantly lower contribution to growth. Domestic demand, however, remains strong, particularly investment trends. Unemployment continues to fall and optimism among households is rising. The Japanese central bank's Tankan business confidence survey suggests that confidence in the corporate sector at the beginning of this year is at its highest since the prolonged economic crisis began at the beginning of the 1990s. In addition, monetary policy continues to be very expansionary and short-term interest rates are currently close to zero per cent, but they are expected to rise in the future according to market expectations.

Table 3. International conditions
Annual percentage change

GDP	2005	2006	2007	2008	2009
United States	3.5 (3.5)	3.4 (3.2)	3.0 (3.2)	3.1 (3.1)	3.1
Japan	2.7 (2.5)	2.9 (2.1)	2.2 (1.6)	1.8 (1.6)	1.5
Euro area	1.4 (1.3)	2.1 (1.9)	1.9 (2.1)	2.0 (2.2)	1.9
OECD 19	2.6 (2.5)	2.8 (2.5)	2.5 (2.5)	2.5 (2.6)	2.4
World	4.8 (4.2)	4.8 (4.0)	4.5 (3.8)	4.4 (3.8)	4.2

CPI	2005	2006	2007	2008	2009
United States	3.4 (3.4)	3.1 (2.8)	2.6 (2.5)	2.5 (2.5)	2.5
Euro area	2.2 (2.2)	2.3 (2.1)	2.1 (2.2)	1.9 (1.8)	1.9
OECD 19	2.3 (2.4)	2.3 (2.1)	2.1 (2.1)	2.0 (2.1)	2.0

	2005	2006	2007	2008	2009
Market growth for Swedish exports	6.8 (5.9)	7.1 (6.1)	6.3 (5.9)	6.1 (5.9)	6.0
International PPI	3.4 (3.4)	2.6 (2.4)	1.7 (1.6)	1.9 (1.8)	2.0
Crude oil price (USD/barrel Brent Blend)	54.5	68.9 (63.0)	72.0 (61.7)	70.5 (60.2)	69.1

Note. The figures in parentheses are the forecasts in the previous Inflation Report. CPI refers to HICP for Germany, the United Kingdom, Denmark, Finland and the euro area. In Norway GDP refers to the mainland economy. OECD 19 refers to the EU-15 (excluding Luxembourg), the United States, Canada, Japan, Norway and Switzerland. Export market growth refers to growth in imports of goods for around 70 per cent of the countries that are recipients of Swedish exports. The forecast is weighed together on the basis of each country's share of all Swedish exports of goods in 2005. International producer prices in national currencies refer to the aggregate of national PPI series for processed goods. This weighted average includes eleven countries and is arrived at using TCW weights. The countries included are the United States, Germany, the United Kingdom, Norway, Finland, Denmark, Belgium, Japan, Canada, France and the Netherlands. These together comprise approximately 85 per cent of the total TCW weighting.

Sources: Intercontinental Exchange, OECD and the Riksbank

Revised forecasts since the February Inflation Report

- As a result of a continued strengthening of economic activity, particularly in Asia, the forecast for global GDP growth has been revised upwards significantly, both for this year and the coming years.
- The GDP forecast for the United States for 2006 has been revised upwards by 0.2 percentage points as a result of the strong outcome for the first quarter. On the other hand, in the light of indications of a slight slowdown of economic activity, the forecast for next year has been revised downwards.
- The GDP forecast for the euro area has been revised upwards slightly for this year as the result of a somewhat stronger outcome in the first quarter. Taking into account the future impact that fiscal tightening in Germany will have on growth, the growth prospects are being adjusted downwards slightly for the longer term.
- The assessment of Swedish export market growth has been revised upwards in the light of strong import demand in some of the key Swedish export markets and firmer global growth.
- The forecast for the oil price has been revised upwards by 10 dollars a barrel for the entire forecast period.

Economic developments in Sweden

The economic upswing will continue, albeit at a slower rate. The rates of increase of investment, output and employment will gradually be dampened. A driving force in this development is that productivity growth has decreased and is expected to stabilise at its trend level. Cost pressures will then also continue to be somewhat higher than before. Continued firm demand is expected to entail a further slight increase in the utilisation of production resources in the economy. Cost pressures will also increase due to a slightly more strained situation in the labour market and a faster rate of wage increase.

The picture of a calmer growth rate outlined in the main scenario does not mean that there will be a downturn in economic activity in the coming years. Demand is expected to remain good in the coming period and household consumption increase relatively sharply. According to the forecasts, investment and exports will also rise.

The assessment of the general outlook for growth has not changed to any great extent compared with the February Inflation Report. The revisions to the forecasts have mainly involved adapting to new outcomes.

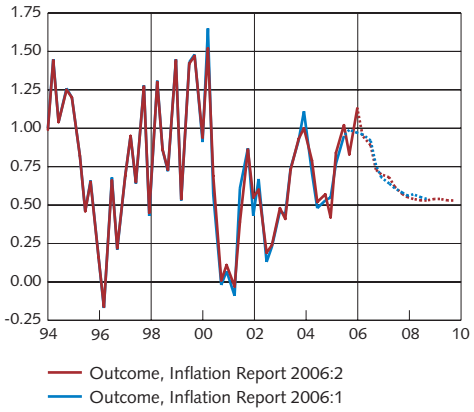
■■ Continued upturn since the February Inflation Report.

The upturn in the Swedish economy continued in 2005. Output increased at a good rate even though this development slowed down slightly at the end of last year (see Figure 26). According to data from the National Accounts, the rate of increase of household consumption and investment in all sectors was curbed to an unexpectedly great extent during the fourth quarter. Export growth, in particular export of services, was surprisingly strong, however.

The slackening of growth in the last quarter of 2005 was temporary, however, as shown by various economic indicators. GDP growth strengthened considerably during the first quarter of the year. Investment accelerated after the slackening off at the end of 2005. At the same time, unexpectedly strong export statistics show that the international economic recovery has been one of the main driving forces underlying the upturn in Sweden in the recent period as well. However, household consumption continued to develop at a surprisingly weak rate.

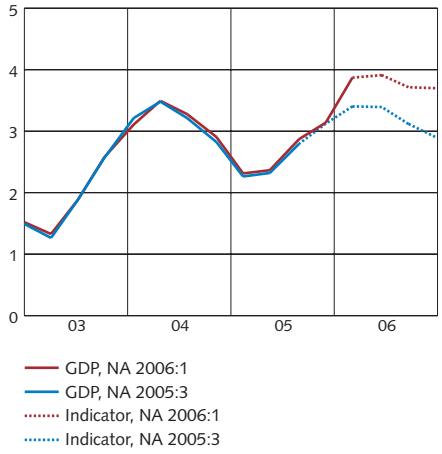
With regard to developments in the second quarter of this year, a number of indicators have been made available for April and May, e.g. the monthly statistics on foreign trade with goods, manufacturing output, new orders, retail trade turnover and the National Institute of Economic Research (NIER)'s monthly Business Tendency Survey. The Riksbank uses statistical methods to assess the information in these

Figure 26. GDP
Quarterly changes in per cent, seasonally adjusted data



Note. The broken lines represent the Riksbank's forecasts.
Sources: Statistics Sweden and the Riksbank

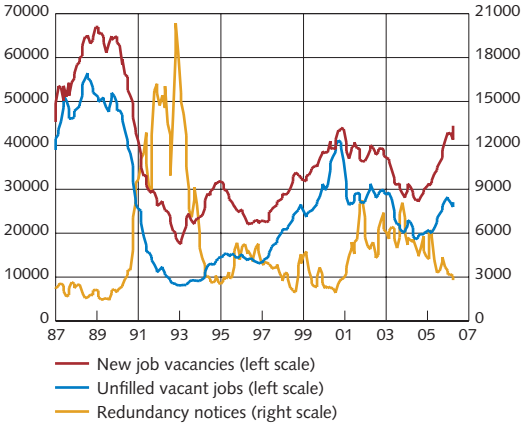
Figure 27. GDP, outcome and forecasts according to indicator models
Annual percentage change, seasonally adjusted data



Note. The figure shows the mean value of the indicator forecasts described and illustrated in the box "GDP indicators" in Inflation Report 2005:3.

Sources: Statistics Sweden and the Riksbank

Figure 28. New and unfilled vacant jobs and redundancy notices
Thousands, seasonally adjusted data



Note. 3-month moving average. Unfilled vacant jobs refers to positions with a duration of more than ten days.

Source: National Labour Market Board

kinds of economic indicators. The results from these indicator models are that the economic signals are relatively stronger than in relation to the February report (see Figure 27).

Labour market statistics also indicate that the upturn will continue although there is some uncertainty about the strength of the upturn. According to the labour force surveys (LFS) for the first 3 months of the year, employment, measured as the number of persons, rose by 1.8 per cent compared with the corresponding quarter last year. At the same time, the increase in the labour force was unexpectedly large and the fall in unemployment was accordingly less than expected. The labour force survey from April indicates some dampening of the rise in both employment and the labour force. One problem in this context is that the change in method last year makes it difficult to interpret recent developments in the labour market on the basis of the labour market surveys.

However, statistics from other sources also indicate that demand for labour will continue to rise. The development of, for instance, the number of newly reported unfilled jobs and redundancy notices shows that the labour market continued to improve at the beginning of the year (see Figure 28).[4] Statistics Sweden's economic data show an increase in the number of both unfilled jobs and vacancies during the first quarter. Furthermore, the hiring plans according to NIER's Business Tendency Survey indicate a continued rise in the number of employed in the second quarter (see Figure 29).

■■ Continued upturn but at a slower pace.

The Riksbank's assessment is that the upturn will continue in the period ahead but that the pace will gradually slow down. This will be reflected in a gradual slowdown of the growth rates for investment, output and employment. Among other things, labour productivity, i.e. output per hour worked, is a driving force in this development. Productivity growth has been unexpectedly strong in recent years. This has meant that output has been able to grow at a rapid pace without cost pressures in the economy (or employment) increasing to any great extent.

Productivity growth was curbed slightly last year and is expected to stabilise during the forecast period at a more normal level seen from a long-term perspective, i.e. the trend rate of increase (see Figure 30). However, the level of this rate of increase seems to have been raised during the past decade, probably due to increased use of information and communication technology. [5] The Riksbank has also repeatedly revised the assessment of trend productivity growth upwards.

At the same time, the fact that productivity growth is approaching more normal levels means that the economy is showing a

4 However, the recent increase should be interpreted with some caution since the National Labour Market Board (AMS) reported that some unfilled jobs had been counted several times.

5 See Andersson, B. and M. Ådahl, "The 'new economy' and Swedish productivity in the 2000s", *Economic Review* 2005:1, Sveriges Riksbank.

more traditional cyclical pattern in which increased resource utilisation is coupled with increased cost pressures. However, if developments, as in recent years, are affected by changes in supply-side factors in the economy, e.g. through improved productivity, production costs for companies can fall even though the measures for resource utilisation indicate that the situation has become more strained.[6]

It is difficult to measure resource utilisation and the different measures do not always paint a consistent picture. However, there are many indications that production resources in the economy have become more strained recently.[7] At the same time, strong productivity growth has kept down cost pressures – for instance, unit labour costs in the business sector decreased in 2003 and 2004. However, during 2005 cost pressures increased again in connection with the dampening of productivity growth.

As with last year, the development of future production capacity is not expected to be improved by technological factors to such a great extent as before. As a result, cost pressures will also be higher in the coming period. At the same time, a continued good level of demand is expected to lead to a further increase in the utilisation of production resources in the economy. Cost pressures will also increase due to the situation in the labour market becoming slightly more strained and a slight rise in the rate of wage increase. This is gradually expected to contribute to driving up inflationary pressure in the economy and thus increasing the need for a tightening of monetary policy during the forecast period, which has also been assumed in the forecast.

Certain demand factors are also expected to contribute to a softening of the upturn in the future. The strong growth in exports is dampened slightly during the forecast period as a result of a slackening of Swedish export market growth. Another factor is that the increase in investment in the business sector is now considered to have passed its peak and will slow down during the forecast period. This is partly due to the assumed interest rate increases but also due to the investment level now being relatively high (see Figure 31).

It should be pointed out that the picture of a calmer development of the economy outlined in the main scenario does not mean that there will be a downturn in the level of economic activity in the next few years. Demand is expected to remain firm and be accompanied by a strong increase in household consumption. According to the forecasts, investment and exports will continue to rise although growth rates will slow down slightly for the reasons mentioned above.

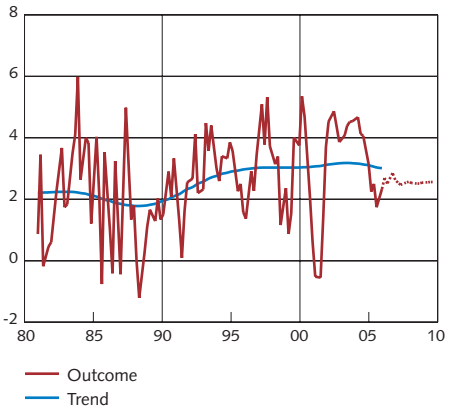
All in all, GDP is expected to increase by 3.7 per cent in 2006. The growth rate will subsequently gradually decrease from 2.8 per cent in 2007 to just over 2 per cent in 2009 (see Table 4).

Figure 29. Hiring plans and number of employed in the business sector
Balance and annual percentage change

Note. Employment plans weighted by the Riksbank. The balance is defined as the difference between the proportion of companies which have expressed a desire to increase the number of employees and the proportion which have expressed a desire to reduce the number of employees.

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

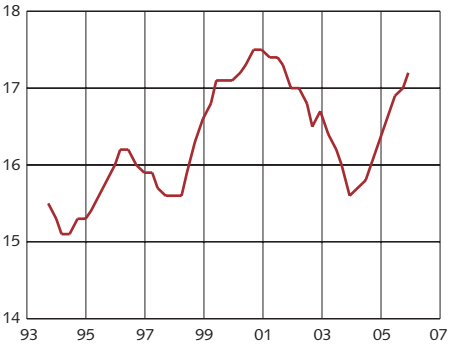
Figure 30. Actual and trend productivity growth in the business sector
Annual percentage change, seasonally adjusted data



Note. Trend calculated using a Hodrick-Prescott filter. The broken lines represent the Riksbank's forecast.

Sources: Statistics Sweden and the Riksbank

Figure 31. Gross fixed capital formation
Per cent of GDP

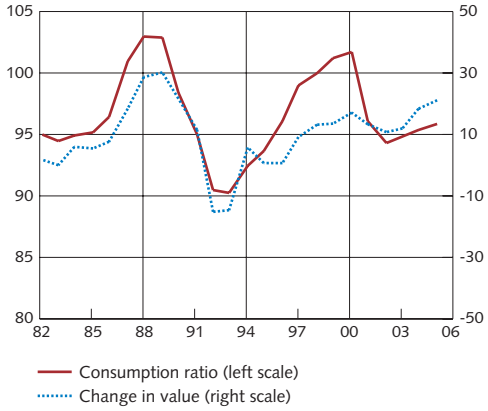


Note. Four quarters moving average.

Sources: Statistics Sweden and the Riksbank

6 See also the box "Resource utilisation, costs and inflation".
7 See the box "Resource utilisation, costs and inflation" in this report and the box "Indicators of resource utilisation" in Inflation Report 2004:2.

Figure 32. Household consumption and changes in the value of real wealth
Percentage of disposable income



Note. Real wealth is households' holdings of houses and tenant-owner apartments. Changes in the value of the housing stock are calculated using estimated values of the previous year's housing stock multiplied by the rate of increase of house prices.

Sources: Statistics Sweden and the Riksbank

Table 4. GDP by expenditure
Annual percentage change

	2005	2006	2007	2008	2009
Private consumption	2.4 (2.7)	2.6 (3.7)	3.3 (3.2)	2.8 (2.9)	2.7
Public consumption	0.7 (0.0)	1.5 (1.6)	1.2 (0.7)	0.6 (0.6)	0.6
Gross fixed capital formation	8.5 (9.9)	6.2 (5.7)	3.5 (4.6)	2.8 (3.0)	2.0
Inventory investment, contribution	-0.2 (-0.2)	-0.4 (0.1)	0.3 (0.1)	0.1 (0.0)	0.0
Exports	6.4 (5.4)	7.9 (6.3)	6.0 (5.8)	6.0 (5.8)	5.5
Imports	7.3 (6.3)	6.0 (7.1)	7.0 (6.5)	6.5 (6.2)	5.9
GDP	**2.7 (2.7)**	**3.7 (3.5)**	**2.8 (2.8)**	**2.4 (2.4)**	**2.2**
GDP, calendar-adjusted	**2.7 (2.7)**	**3.9 (3.8)**	**2.9 (2.9)**	**2.3 (2.3)**	**2.2**

Note. The figures in parentheses are the forecasts in the previous Inflation Report. The data refer to actual, non-calendar-adjusted growth rates.

Sources: Statistics Sweden and the Riksbank

The assessment has not been changed to any great extent compared with the economic outlook outlined in the February Inflation Report. However, the forecasts for certain GDP components have been adjusted to some extent, in particular for the current year. The most important adjustments are for exports and household consumption. These revised forecasts mainly concern adjustments to new outcomes.

The development of the implied forward rates on which the forecasts in this report are based indicates a greater rise in interest rates three years ahead than in the February Inflation Report. However, this has not led to any major downward revision of the forecasts since there are now also expectations of a stronger international and domestic economic performance.

■■ Strong consumption growth during the forecast period.

Several factors indicate that there will be a sharp rise in household consumption during the forecast period although development up to the end of the first quarter this year has been surprisingly weak.

Employment is expected to increase in the coming years, which will lead to stronger growth in wage income. Household disposable income is therefore expected to increase more rapidly in the future, although the rate of increase will slow down slightly towards the end of the period.

Property prices have continued to rise, with the result that households' real wealth, i.e. the value of houses and tenant-owned apartments, has increased. Historically, there has been a clear correlation between the change in value of real wealth and household consumption in relation to disposable income (see Figure 32). The value of financial assets has also increased. Admittedly, stock market volatility has been rather dramatic recently and market values have then fallen. However, seen from a long-term perspective, the share price index has risen and thereby contributed to an increase in financial wealth (see Figure 33). Household indebtedness has also rapidly increased, partly due to rising house prices. However, net household wealth has also increased and this will probably stimulate consumption in the coming period.

The rapid increase in household borrowing appears to have been

at least partly driven by the structural changes of the past decade, not least the establishment of the low-inflation economy. It is very difficult to assess when an adaptation of this kind comes to an end. In a longer perspective, it is unsustainable, however, for household indebtedness and house prices to continue to increase at the same pace as they have in recent years.

The beginning of the current decade saw a steep rise in household saving (see Figure 34). This was probably due to a combination of factors, including the stock market fall, the demographic situation and also the weak development of the labour market which pushed up precautionary saving. The household saving ratio has decreased slightly in the past two years. This year the savings ratio is expected to rise slightly again although brightening labour market prospects will probably reduce precautionary saving by households in the future. Moreover, the proportion of the population with the highest savings ratio, i.e. the group aged between 45 and 64, will decrease during the period. This also indicates that the savings ratio will eventually diminish.

During the upturn, households have until now restrained consumption to an unexpected extent and the most recent outcomes for consumption have been weaker than expected. This has motivated a relatively large downward adjustment of the forecast for 2006. This year consumption growth is now expected to be 2.6 per cent. Bearing in mind, among other things, developments in household wealth and income, household consumption is still expected to grow at a rather fast rate for the remainder of 2006 and during 2007. The rate of increase will subsequently decrease slightly in the following years apace with a dampening of income development (see Table 4 and Figure 34).

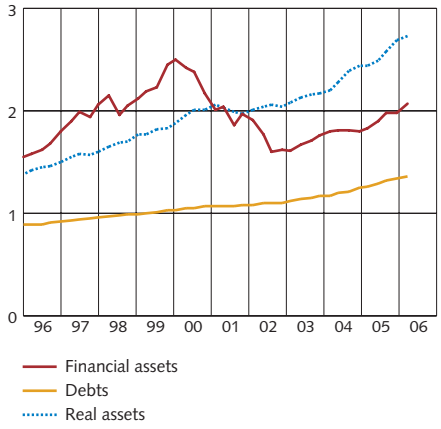
■■ Weaker investment growth in the period ahead.

Investments in the business sector are now considered to have passed the growth peak (see Figure 35). The most recent investment survey indicates that investments in the business sector are continuing to increase this year although at a slower rate than last year. As regards housing investments, the statistics of construction of apartments also indicate that development will increasingly dampen in the future. Apace with rising interest rates and companies becoming increasingly satisfied with the level of their production capacity, the rate of increase for the gross fixed capital formation is expected to continue to gradually slacken during the forecast period.

The converse applies to public sector investments. After weak growth in recent years, these are instead expected to start to increase partly due to increased investment scope for local government and central government infrastructure. Taken as a whole, however, the forecast is that the rate of increase for total gross fixed capital formation will gradually decrease during the forecast period from over 6 per cent in 2006 down to 2 per cent in 2009.

As a result of the new outcome for investments in the first

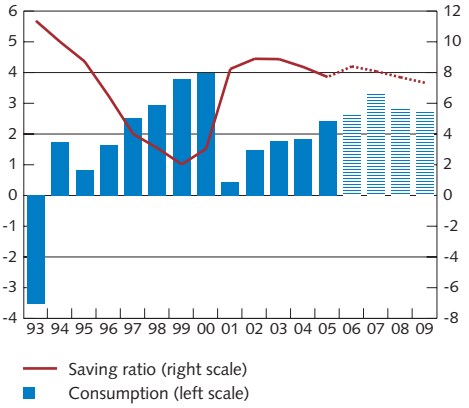
Figure 33. Households' wealth
Percentage of annual disposable income



Note. Financial assets excluding tenant-owned apartments and group insurance saving. Real assets refers to houses and tenant-owned apartments.

Sources: Statistics Sweden and the Riksbank

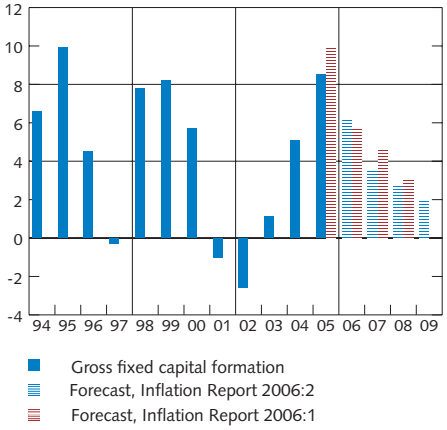
Figure 34. Households' consumption and saving ratio
Annual percentage change and percentage of disposable income



Note. Including the Church of Sweden for the entire period. The broken lines and light blue bars represent the Riksbank's forecasts.

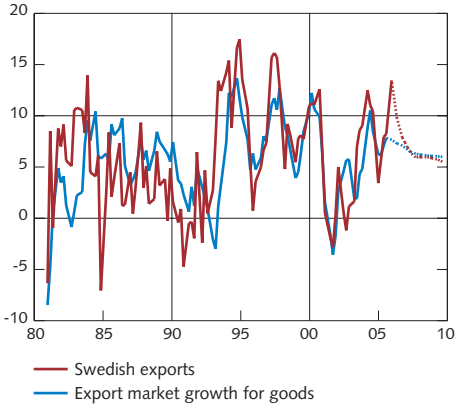
Sources: Statistics Sweden and the Riksbank

Figure 35. Gross fixed capital formation
Annual percentage change



Sources: Statistics Sweden and the Riksbank

Figure 36. Total Swedish exports and export market growth
Annual percentage change



Note. The broken lines represent the Riksbank's forecasts.

Sources: Statistics Sweden and the Riksbank

quarter, the investment forecast has been revised upwards slightly in the short term. In the light of a somewhat stronger initial situation and the investment survey trends indicating a future slackening, the forecast for subsequent development has been adjusted downwards (see Figure 35 and Table 4). Compared with the February Inflation Report, a somewhat clearer dampening of investment growth is now outlined for the coming years.

■■ Steady growth of exports and imports.

A continued stable international economic recovery in the years to come will lay the foundations for firm export growth during the forecast period. The rate of increase is gradually dampened slightly as a result of the expected strengthening of the exchange rate (TCW index) and lower export market growth (see Figure 36).

Compared with the February Inflation Report, the prospects for exports have been revised upwards, in particular for 2006. This is largely connected with the strong outcomes for the last two quarters. Furthermore, the export market has grown more quickly than expected and future prospects have been revised upwards slightly. On the margin, the slightly weaker forecast for the path of the krona in terms of the TCW index has contributed to the upward adjustment of the forecast for exports.

Imports also increased more than expected during the fourth quarter of 2005 although development was weaker than expected in relation to total demand during the first quarter of this year. In the short term, the forecast for 2006 has therefore been revised downwards in relation to the assessment made in the February Inflation Report. The forecast is on the whole unchanged for the rest of the period, i.e. the growth in imports is expected to be relatively high this year in the short term and then subsequently decline during the forecast period apace with the level of economic activity entering into a calmer phase.

■■ Increased general government net lending.

General government net lending totalled 2.8 per cent of GDP in 2005, which was higher than expected. The foremost reasons for this were higher tax revenue (including corporate taxes), lower central government expenditure (including costs for sick leave) and a higher net lending in the local government sector than expected. Last year's development is also considered to lead to a level where net lending is higher throughout the forecast period than in the previous forecast. Net lending is expected to fall to around 2 per cent of GDP at the end of the forecast period, which is in line with the target for public sector finances (see Table 2, Key figures, in the Summary). Since the February Inflation Report, the Government has presented its Spring Budget Bill. The proposals are expected to lead to a slight increase in public consumption and other public expenditure.

Public sector consumption was higher in 2005 than forecast in

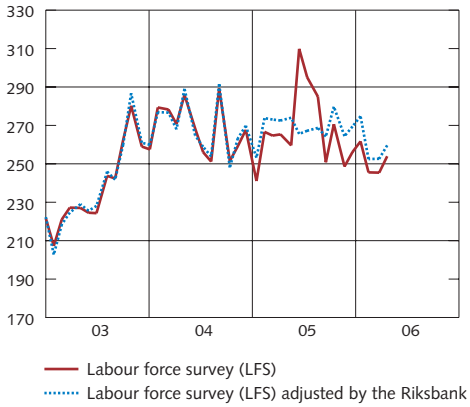
the February Inflation Report. The outcome for the fourth quarter was higher than expected but in particular the first three quarters were revised upwards. The assessment for development during 2007 has been adjusted upwards slightly, partly as a result of the new proposals in the Spring Budget Bill (see Table 4).

New seasonal pattern in labour force survey statistics

The change in method in the labour force survey makes it hard to interpret recent developments in the labour market. Last year, there was an unusually large increase in open unemployment during the summer months. This can indicate that unemployment according to the new labour force survey displays a different seasonal pattern than before. In its work of linking the old and new data, Statistics Sweden has not yet taken this effect into consideration, although work is in progress in this area.

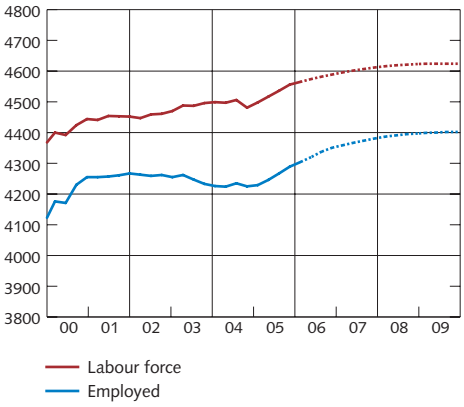
In order none the less to take into account the new seasonal pattern in unemployment, the Riksbank has chosen for the time being to adjust the seasonal adjustment of unemployment (see Figure 37). This also affects the seasonal pattern in the labour force. The new seasonal adjustment entails an increase in level of both open unemployment and the labour force at the end of 2005 and the beginning of 2006, which affects the forecast in future. The average annual values for the period prior to 2006 are not affected.

Figure 37. Number of unemployed
Thousands, seasonally adjusted data



Sources: Statistics Sweden and the Riksbank

Figure 38. Employment and labour force
Thousands, seasonally adjusted data



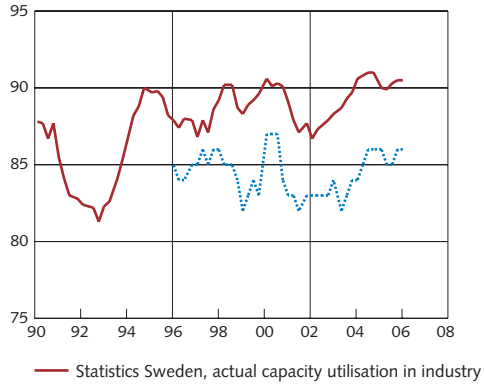
Note. The broken lines represent the Riksbank's forecasts.
Sources: Statistics Sweden and the Riksbank

■■ Labour force increasing faster than expected.

Employment, measured in terms of hours and persons in work, is expected to increase this year due to strong demand and expanded labour market programme measures aimed at reducing unemployment. According to the forecast, the number of employed will rise by around 70,000 persons this year, which includes about 14,000 in labour market programme measures. During the remainder of the forecast period, demand is expected to continue to increase and drive up employment, although the rate of increase will be gradually dampened apace with the slackening of the economic recovery (see Figure 38 and Table 5). Employment measured in terms of the number of persons is expected to rise rather more quickly than in the February Inflation Report, in particular for 2007. Increasingly bright prospects in the labour market indicate that the relationship between GDP growth and the development of employment is now starting to become more normal viewed from a cyclical perspective. This has provided motivation for the upward adjustment of the employment forecast.

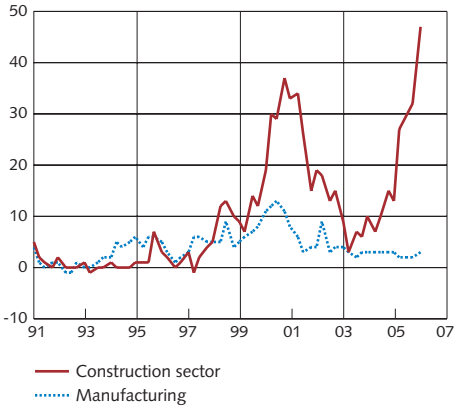
The labour force is also expected to increase relatively sharply during the forecast period (see Figure 38 and Table 5). The

Figure 39. Capacity utilisation in industry
Per cent, seasonally adjusted data



Sources: The National Institute of Economic Research and Statistics Sweden

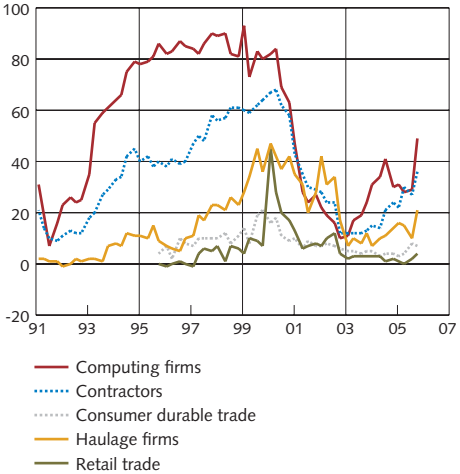
Figure 40. Proportion of firms reporting a shortage of labour
Per cent, seasonally adjusted data



Note. The shortage rates show the proportion of firms reporting a shortage of labour as the foremost barrier to increased output.

Source: National Institute of Economic Research

Figure 41. Proportion of firms reporting a shortage of labour
Per cent, seasonally adjusted data



Note. The shortage rates show the proportion of firms reporting a shortage of labour as the foremost barrier to increased output.

Source: National Institute of Economic Research

participation rate traditionally increases in periods when labour market conditions improve. Groups who have previously refrained from seeking work (for instance, students) enter the labour market when the prospects of obtaining a job increase. However, there are factors that will probably restrict the labour supply during the forecast period. For instance, the proportion of 25-59 year olds, i.e. the age group with the highest participation rate, is decreasing. At the same time, demographic developments are expected to result in a slight increase in the number of regular students and the number of sick persons outside the labour market during the forecast period. During 2006, the labour supply is also restricted by an increase in the number of persons in labour market training programmes. However, the programme volumes are expected to decrease slightly again in 2007.

The unexpectedly large increase in the labour force during the first quarter and a new assessment of the effect of the change in method in the labour force survey have provided motivation for an upward adjustment of the forecast for this year. A faster increase in the labour force than in the previous assessment is also expected during the rest of the forecast period, the main explanation for which is the adjustment of the employment forecast (see Table 5).

Table 5. Labour market forecast
Annual percentage change

	2005	2006	2007	2008	2009
Number of hours worked, NA*	0.5 (0.4)	1.8 (1.7)	1.0 (0.9)	0.2 (0.2)	0.1
Number of employed	0.7 (0.7)	1.7 (1.5)	1.0 (0.6)	0.5 (0.2)	0.2
Labour force	0.7 (0.7)	1.1 (0.5)	0.6 (0.3)	0.3 (0.1)	0.1
Open unemployment, per cent of labour force	5.9 (5.9)	5.5 (5.0)	5.1 (4.8)	4.9 (4.6)	4.8
Labour market policy programmes, per cent of labour force	2.7 (2.7)	3.2 (3.3)	2.9 (3.1)	2.5 (2.6)	2.4

* Calendar-adjusted data.

Note. The figures in parentheses are the forecasts in the previous Inflation Report.

Sources: Statistics Sweden and the Riksbank

Increased demand for labour is expected to lead to a slight fall in open unemployment during the forecast period. The increased labour supply will restrain this decrease, however (see Table 5). In relation to the February Inflation Report, the forecast for unemployment is now slightly higher for the coming years. The largest part of this revision is explained, however, by a new assessment of how the change in method in the labour force survey affects the measured employment. The basic approach to the resource situation in the labour market in these years is therefore substantially unchanged compared with the February Inflation Report.

■■ More of the economy's resources to be used in future.

Capacity utilisation in industry remains at historically high levels (see Figure 39), although the proportion of manufacturing firms which state that they have a labour shortage remains very low (see Figure 40). The proportion of firms with a labour shortage has continued to

increase in the last quarter within several service sectors although the shortage rates are on the whole historically low (see Figure 41). It is only within the construction industry that there is a great shortage of labour – almost half of the respondent firms in the construction industry considered that they had a shortage of labour (see Figure 40) and according to the Business Tendency Survey for May, the proportion has increased further.[8] Continued buoyant demand in the future is expected to lead to a further slight increase in utilisation of the economy's resources.

■■ Productivity growth is stabilised around its long-term level.

Productivity growth was dampened in the course of 2005 at the same time as the economy's resources were under increased strain (see Figure 30). This is in line with the historical cyclical pattern, although the slowdown was rather sharper than expected. Productivity growth recovered during the first quarter of this year. This development depends largely on productivity growth in industry having increased again after the cyclical slackening off in 2005 (see Figure 42). This is driven by manufacturing output increasing more quickly in early 2006 than at the end of 2005 due to the strong demand for exports. During the rest of the forecast period, productivity growth is expected to develop in line with the trend development.

■■ Rising wage increases and unit labour costs.

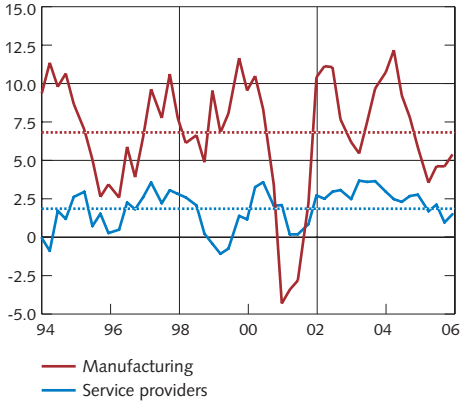
The weak labour market in recent years has had a dampening effect on wage development in the business sector. Despite employment improving last year and being expected to increase, this development has still not led to any greater upward pressure on wages.

Since the February Inflation Report, preliminary short-term wage statistics for December 2005 to March 2006 have been published. These statistics indicated a rate of wage increase in the whole economy for 2005 of 3.1 per cent on average. Wages in the business sector rose by 3.2 per cent during this period while the corresponding figure for the public sector was 2.9 per cent. Once retroactive wages have been paid, the rate of wage increase in the public sector will probably be revised slightly upwards.

The shortage of labour will probably push up wages in the construction sector this year and next year. However, it should be pointed out that the construction sector only accounts for 7 per cent of the wages bill in the business sector, which means that the wage forecast for the business sector is only marginally affected by developments in this sector.

Wages are expected to increase by 3.4 per cent this year. Wage development in the business sector is subsequently expected to continue to rise to over 4 per cent at the end of the forecast period apace with increased demand for labour and increased resource

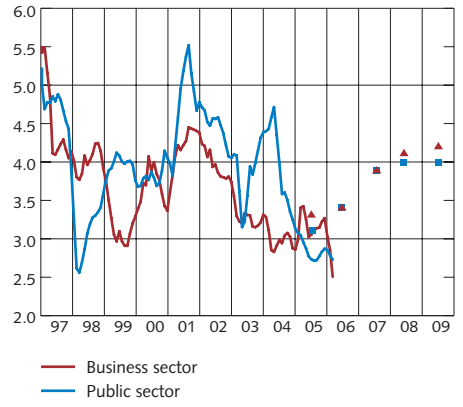
Figure 42. Labour productivity in the manufacturing and service sectors
Annual percentage change, seasonally adjusted data



Note. The broken line represents the mean value 1994-2005.

Source: Statistics Sweden

Figure 43. Nominal hourly wages
Annual percentage change

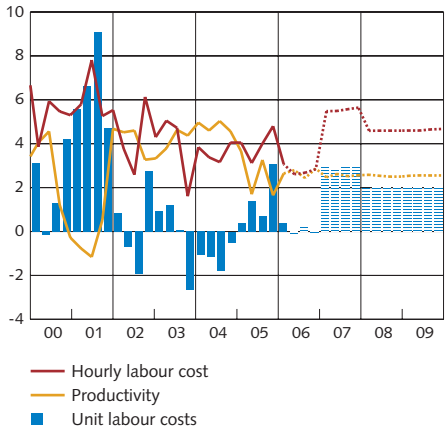


Note. 3-month moving average. Preliminary outcomes from March 2005. The dots represent the Riksbank's forecasts.

Sources: National Mediation Office and the Riksbank

8 See the box "Resource utilisation, costs and inflation" for a discussion of different measures of resource utilisation and the current situation.

Figure 44. Unit labour costs in the business sector
Annual percentage change, seasonally adjusted data



Note. The broken lines and light blue bars represent the Riksbank's forecasts.

Sources: Statistics Sweden and the Riksbank

utilisation (see Figure 43 and Table 6). It is expected that public sector wages will undergo a similar development although with a slightly slower rate of increase at the end of the period (see Figure 43). Compared with the February Inflation Report, the forecast for public sector wage development has been adjusted downwards slightly for this year. This is due to the preliminary outcomes for wage development in the public sector for 2005 not being revised upward to the extent previously expected.

According to the National Accounts, unit labour costs in the business sector rose more quickly than forecast in 2005. This development is explained by higher labour costs and slightly weaker productivity growth than expected.

The increase in unit labour costs was temporarily very low this year due to reductions in collective charges. Employers set aside extra funds at the time of the transition to a new agreement-linked pension system between the Confederation of Swedish Enterprise and the Swedish Trade Union Confederation (LO). Recently, it has been realised that these funds were no longer needed. The parties therefore decided to release the employers from a portion of the pension contributions. These reductions are expected to disappear next year which will mean that the percentage change in unit labour costs will instead be temporarily pushed up. Since the variations in costs are temporary, this is not expected to affect inflation to any great extent.

Apart from these temporary effects, unit labour costs are expected to rise slightly in the years ahead apace with the continuing strengthening of economic performance and the increasing rate of wage increase (see Figure 44 and Table 6).

Table 6. Forecasts for wages and unit labour costs in the business sector
Annual percentage change, seasonally adjusted data

	2005	2006	2007	2008	2009
Hourly wage, NMO	3.3 (3.2)	3.4 (3.6)	3.9 (3.9)	4.1 (4.1)	4.2
Hourly wage, NA	3.9 (3.5)	4.0 (4.0)	4.3 (4.3)	4.5 (4.5)	4.6
Employers' social security contributions	0.0 (-0.2)	-1.2 (-0.2)	1.2 (0.0)	0.1 (0.1)	0.0
Hourly labour costs, NA	3.9 (3.4)	2.8 (3.8)	5.5 (4.3)	4.6 (4.5)	4.6
Productivity	2.4 (2.5)	2.6 (2.8)	2.5 (2.6)	2.5 (2.5)	2.5
Unit labour costs	1.4 (0.9)	0.2 (1.0)	2.9 (1.7)	2.0 (2.0)	2.0

Note. NMO is the National Mediation Office's short-term wage statistics and NA is the National Accounts. The hourly wage cost is defined as the sum of actual wages, collective charges and wage taxes divided by the seasonally adjusted total number of hours worked. The unit labour cost is defined as labour cost divided by the seasonally adjusted value added in fixed prices.

Sources: National Mediation Office, Statistics Sweden and the Riksbank

Inflation expectations

In its economic analysis, the Riksbank takes into consideration the expectations of firms and households regarding the development of consumer prices since they affect the actual rate of inflation through price and wage formation. These expectations are in turn affected by a number of different factors such as the existing price pressure, the conduct and communication of the Riksbank and the general picture of the economy.

■■ Increase in households' inflation expectations.

Firms' expectations of the rate of price increases have been stable since the February Inflation Report. According to NIER's Business Tendency Survey in April, inflation is expected to be 1.3 per cent in a year's time.

Since the previous Inflation Report which was published at the end of February, households' inflation expectations have increased by 0.5 percentage points. Households now expect a rate of price increases of 2.0 per cent in one year's time (see Figure 45).

This upward trend in the expected development of prices can also be found among money market agents, the social partners and purchasing managers. According to the most recent survey from the end of May, inflation expectations have increased among all these groups. Inflation is now expected to be 1.9 per cent on average in a year's time and 2.1 per cent in two years' and five years' time (see Figure 46 and Table 7).

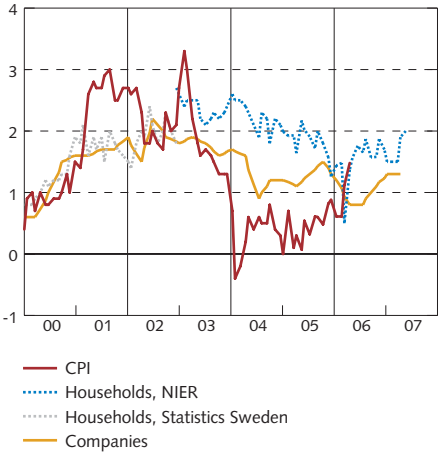
Table 7. Inflation expectations according to different surveys
Per cent, average

Expected inflation rate in	1 year	2 years	5 years
Money market agents*	1.8 (1.6)	2.0 (1.9)	2.0 (1.9)
Employer organisations*	2.0 (1.6)	2.2 (2.0)	2.2 (2.2)
Employee organisations*	1.7 (1.5)	1.9 (1.7)	2.0 (1.9)
Purchasing managers, trade*	1.9 (1.8)	2.0 (1.9)	2.1 (2.1)
Purchasing managers, manufacturing*	2.1 (1.9)	2.3 (2.0)	2.2 (2.1)
Households (Consumer Survey) in May (January)	2.0 (1.5)		
Firms (Business Tendency Survey) in April (January)	1.3 (1.3)		

Note. * indicates that the survey was carried out by Prospera in May. The results from the previous survey in February 2006 are given in parentheses unless otherwise stated.

Sources: National Institute of Economic Research and Prospera Research AB

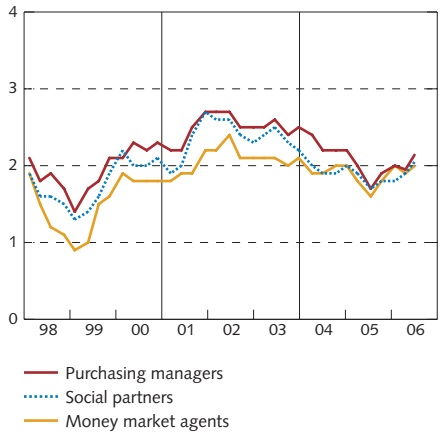
Figure 45. Actual inflation (CPI) and households' and companies' expectations of inflation one year ahead
Annual percentage change



Note. The curves for inflation expectations have been shifted ahead 12 months to coincide with the point in time to which the expectations refer. The horizontal broken lines at 2, 1 and 3 per cent respectively are the Riksbank's inflation target and the tolerance limits for the annual change in the CPI.

Sources: The National Institute of Economic Research and Statistics Sweden

Figure 46. Different agents' expectations of inflation two years ahead
Annual percentage change



Note. The horizontal broken lines at 2, 1 and 3 per cent respectively are the Riksbank's inflation target and the tolerance limits for the annual change in the CPI.

Source: Prospera Research AB

Revised forecasts since the February Inflation Report

- New outcomes have led to export and investments being revised upwards while consumption and import have been adjusted downwards for 2006. Altogether, GDP growth has been adjusted upwards marginally. The changes are small for 2007-2008.

- The forecast for employment has been adjusted upwards compared with the previous forecast. The forecast for the labour force has also been revised upwards due to a stronger outcome than expected, a new seasonal pattern has been taken into consideration to a greater extent and a faster growth of employment.

- Overall, unemployment has also been revised upwards compared with the February Inflation Report. The largest part of the revision is explained by a new assessment of how the change in method in the labour force survey affects the measured employment.

- The forecast for hourly wages has been revised downwards due to the surprisingly weak preliminary wage outcomes. This may be related to the increase in the supply of labour.

- The increase in unit labour costs in the business sector has been revised downwards for 2006 and upwards for 2007. This is largely due to the level of the agreed collective charges being temporarily low this year.

Inflation assessment

Inflation has risen in the past few months. This is mainly due to a rising rate of price increases for a limited number of product groups although, at the same time, there are some indications that inflationary pressure has increased more generally. Increasing cost pressure in the economy is expected to lead to a gradual increase in inflation during the forecast period. The assessment is that inflation will be around 2 per cent a couple of years ahead. However, imported inflation, excluding oil products, is expected to remain very low due to low price increases on internationally-traded products, and increased imports from countries with a low price level. Like other forecasts in the report, the forecast for inflation is based on a gradual raising of the repo rate.

Rising inflation.

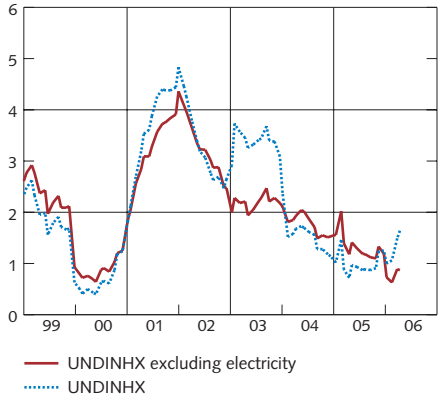
Several factors have contributed to the low inflation in recent years. Cost pressure in the economy has been low due to robust productivity growth and moderate wage increases. The weak price trend for imported products and the gradual strengthening of the exchange rate between 2002 and 2004 has probably also restrained inflation with a slight lag. In some sectors, such as the food industry, stiffer competition has contributed to a more subdued development of prices. Domestic inflation has also been held back by the slow increase in rents.

So far in 2006, inflation has risen. In May, inflation was 1.6 per cent measured by CPI and UND1X.[9] The rise in inflation is attributable to a rapid rate of increase for the price of electricity, among other things. Domestic inflation (UNDINHX), excluding electricity, has not risen at all during 2006 (see Figure 47).

Electricity prices rose in May by an annual rate of almost 12 per cent. The rapid rate of increase seems essentially to be due to a change in the conditions for electricity production, both temporarily and more permanently. An unusually cold spring and temporarily low quantities of water in the Nordic reservoirs led to a sharp rise in electricity prices on the electricity exchange, Nordpool, from the beginning of the year to the first week in May. Furthermore, a rising price for emission rights contributed to the rapid increase in prices in the spring. However, during the past month, electricity prices have fallen substantially again, partly due to fall in the prices of emission rights. A factor of a more structural nature, which has contributed to high electricity prices, is the internationalisation of the electricity market. This means that Swedish electricity prices are being gradually adapted to a higher international price level.

Higher imported inflation has also contributed to higher inflation. Consumer prices on imported goods, excluding oil products, continued to decrease at an annual rate in May, albeit at a slower pace than before. The slowdown in the rate of price increases is probably partly due to the weakening of the exchange rate in 2005. Swedish

Figure 47. Domestic inflation (UNDINHX)
Annual percentage change



Note. UNDINHX refers to prices of mainly domestically produced goods and services in UND1X.

Sources: Statistics Sweden and the Riksbank

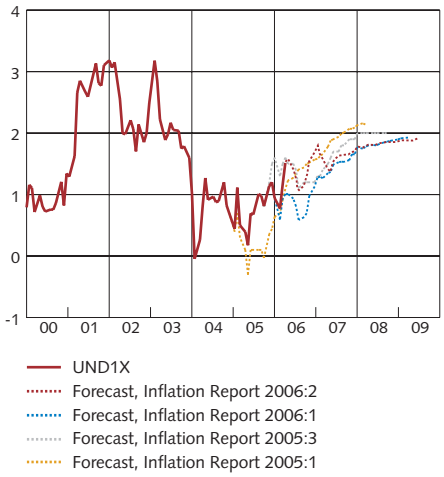
Figure 48. Producer and consumer import prices (UNDIMPX)
Annual percentage change

Note. UNDIMPX refers to prices of mainly imported goods and services in UND1X.

Sources: Statistics Sweden and the Riksbank

9 Forecasts and figures in this Inflation Report are based on inflation outcomes up to and including April. The outcome for May was in line with the expected outcome.

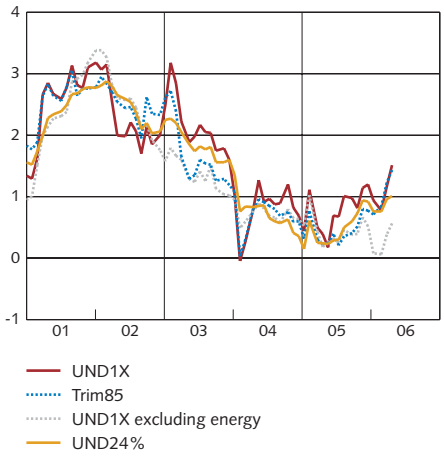
Figure 49. UND1X, outcome and forecasts on different occasions
Annual percentage change



Note. In Inflation Report 2005:1 the main scenario was based on the assumption of a constant repo rate for two years. The figure illustrates the forecast published in a box and which was based on the assumption that the repo rate developed in line with the implied forward rates.

Sources: Statistics Sweden and the Riksbank

Figure 50. Different measures of underlying inflation
Annual percentage change



Note. The alternative measures are calculated on the basis of CPI divided into around 70 subgroups. UND24 is aggregated using weights adjusted for the historical standard deviation for the deviation between the annual rate of increase in the total CPI and the respective subgroup over the past 24 months. In TRIM85 the 7.5 per cent most positive and negative yearly price changes each month have been excluded.

Sources: Statistics Sweden and the Riksbank

importers had already experienced an acceleration in price increases for consumption goods in 2005 and some of these increases seem to have had an impact on consumer prices with some time lag (see Figure 48).

Of the imported goods (excluding oil products), it is primarily the prices of clothing and shoes that have increased at a more rapid rate this year than during last year. In May, the rate of price increase on clothing and shoes was almost 4 per cent. Consumer prices for other imported goods fell by just under 2 per cent on an annual basis. The increasing share of imports from low-cost countries is considered to have contributed to the fall in import prices. Since the import of clothing is regulated by quotas, the scope for increased low-price imports in these product categories is probably limited. This may be an explanation why these prices are at present increasing more quickly than other import prices. Another reason may be that the weakening of the exchange rate during 2005 has had a greater delayed impact on prices for clothing and shoes than on other import prices.

■■ Higher inflation than expected.

Compared with the assumption made in the February Inflation Report, inflation has increased slightly more during the spring. The foremost reason is energy prices. The price of electricity was expected to rise although the increase has been surprisingly large. In addition, the prices of petrol and heating oil have continued to increase by an annual rate of 10 per cent instead of falling as forecast in February.

However, seen from a slightly longer perspective, inflation has not been unexpectedly high during the spring (see Figure 49). It was expected in the autumn that inflation, for instance, would be around 1.5 per cent at the beginning of 2006. Compared with this assessment, prices of petrol and heating oil have risen more than expected at the same time as price rises on other imported goods have been surprisingly low.

■■ Underlying inflation is increasing.

In order to analyse developments in inflation excluding various temporary effects, the Riksbank studies different measures of underlying inflation. The different measures are intended to distinguish the trend change in the general level of prices in different ways. One common method is to exclude the effects of certain goods and services, such as energy, for which prices often fluctuate sharply as the result of temporary factors. It is also common to calculate underlying inflation by removing or reducing the significance of the groups of products and services whose prices vary most. Figure 50 presents different measures of underlying inflation.

Several of the indicators show that underlying inflation has risen since mid-2005. At the same time, as stated above, a limited number of product categories contributed to rising inflation in 2006 (mainly electricity, clothing and shoes). This is usually regarded as an indica-

tion that inflationary pressure is not generally high but that factors specific to particular products are involved. However, electricity has a weighting of approximately 5 per cent and clothing and shoes of approximately 6 per cent in UND1X. This means that price increases for these product groups are of such significance for recorded inflation that they will result in higher trend inflation according to some of the measures in Figure 50. When the prices of particular products are excluded from the calculations of inflation, one must also be take into account that it is uncertain in practice how large a part of the increase in these prices is due to temporary supply factors or more cyclical demand-related factors.

During the past year, certain other indications of a weak increase in inflationary pressure have been noted. Producer prices for consumer goods have increased more rapidly than in previous years (see Figure 51). In April, producer price inflation for consumer goods stood at around 2 per cent on an annual basis. This can be expected to contribute to faster price increases for consumers. The fact that inflationary expectations have risen among households and firms is also an indication that inflationary pressure in the economy is increasing.

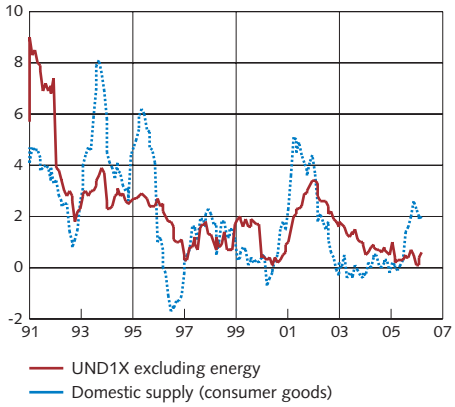
■■ Gradual increase in cost pressures.

In coming years, inflation is expected to rise slightly and to be close to the 2 per cent target a couple of years ahead. However, for the greater part of 2006, UND1X inflation is expected to remain around 1.5 per cent. The forecast assumes a gradual increase in the repo rate in line with the implied forward rates (see Figure 4).

In the short term, the high rate of increase of energy prices (electricity and oil products) contributes just under one percentage point to inflation. This effect will subside at the beginning of 2007 and higher cost pressures will instead lead to increased inflation. The rise in inflation is being curbed by the fact that the prices of imported goods are only rising marginally. Domestic inflation, on the other hand, is expected to rise relatively quickly, due in part to the upturn in domestic cost levels (see Figure 52). Furthermore, the rate of rent increases is expected to normalise, partly as a result of rising interest rates and higher energy prices.

Last year, cost pressures rose mainly as a result of a slight slackening in productivity growth. This meant that unit labour costs in the business sector started to increase at a faster rate than in previous years. In coming years, better labour market conditions are expected to result in slightly faster wage increases. At the same time, productivity growth is expected to be more or less unchanged. Consequently, there will be a further slight rise in the rate of increase of unit labour costs during the forecast period. A temporary weak increase in unit labour costs this year and an additional increase next year due to the reduction in the collective charges in 2006 is not expected to affect inflation to any great extent.

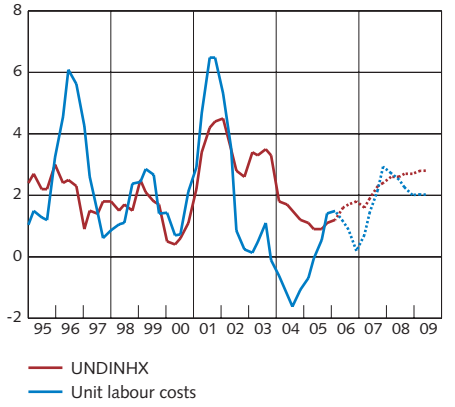
Figure 51. Producer prices for consumer goods and UND1X excluding energy
Annual percentage change



Note. The price index for domestic supply is a weighted average of the import price index and the domestic market price index within the producer price index system.

Sources: Statistics Sweden and the Riksbank

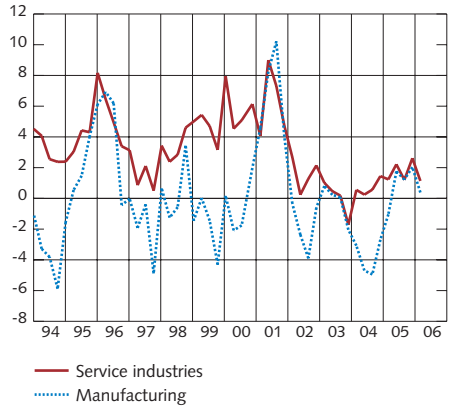
Figure 52. Domestic inflation (UNDINHX) and unit labour costs in the business sector
Annual percentage change



Note. UNDINHX represents prices for mainly domestically produced goods and services in UND1X. Unit labour costs are calculated as a four-quarter moving average. The broken lines represent the Riksbank's forecasts.

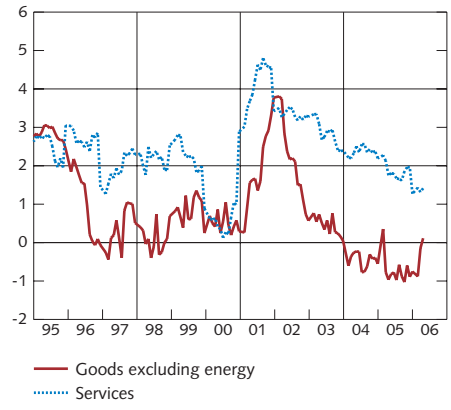
Sources: Statistics Sweden and the Riksbank

Figure 53. Unit labour costs in the goods and services sectors
Annual percentage change



Source: Statistics Sweden

Figure 54. Rate of price increase for goods and services in UND1X
Annual percentage change



Note. The rate of price increase is calculated excluding the effects of changes in indirect taxes and subsidies.

Sources: Statistics Sweden and the Riksbank

Higher cost pressures in goods sectors than in service sectors

Towards the end of the forecast period, domestic inflation is expected to amount to almost 3 per cent while unit labour costs in the business sector are expected to rise by 2 per cent. Historically, it is not abnormal for domestic inflation to be higher than the rate of increase in unit costs in the business sector. In the 21st century, domestic inflation has been considerably higher than the rate of increase in unit labour costs in the business sector (see Figure 52).

The fact that consumer prices can increase in this way more rapidly than business sector costs is partly due to cost developments in the whole of the business sector not being a particularly exact measure of the cost development for firms concentrating on the domestic market. Among other things, there is a higher proportion of services in the consumption basket included in domestic inflation (UNDINHX) than for the whole of the business sector's output. Since productivity growth is normally lower in the service sectors than in the manufacturing sectors, wage increases of approximately the same size will increase costs more in the service sectors than in the manufacturing sectors. According to Figure 53 unit labour costs in the service industries have on average increased more rapidly than in the manufacturing industries since 1994. Furthermore, cost development in the manufacturing industries is generally lower in those industries which target the export market than in those which target the domestic market. This is mainly due to productivity growth being high in manufacture of the type of goods exported by Sweden.

The greater increase in unit labour costs in the service industries than in the manufacturing industries has in turn contributed to services increasing more rapidly in price on average than the price of goods. In Figure 54, UND1X inflation is broken down into the rate of price increase for goods and services respectively (instead of domestic and imported inflation). A further explanation for the price of goods increasing more slowly than the price of services in the past decade is probably that the stiffer competition has had greater impact for manufacturing firms than for companies in the service sector. This ought to have contributed to greater pressure on profit margins in manufacturing than in service industries.

■■ Low imported inflation during the forecast period.

Prices of imported goods are expected to develop weakly during most of the forecast period. Stiff international competition and an expected fall in raw material prices means that international price increases on manufactured goods are expected to be low. Continued substitution by cheaper goods and an appreciation of the exchange rate are also expected to help hold down Swedish import price increases. However,

the Riksbank expects that the price-dampening effects on import prices from this quarter will diminish slightly during the forecast period. Towards the end of the forecast period, imported inflation, excluding oil products, is estimated at just under a half percentage point.

In the short term, however, inflation, including oil products, is anticipated to be slightly higher owing to the high oil price. Since the oil price is expected to fall slightly, imported inflation is subsequently dampened by falling prices on petrol and heating oil. The rate of price increases on imported goods, including oil products, is expected to be close to zero a couple of years ahead (see Figure 55).

■■ Higher inflation in the short term although unchanged in the long term, compared with the February Inflation Report.

Compared with the assessment in February, inflation is expected to be somewhat higher in the short term. This is primarily due to a faster increase in energy prices, both the electricity price and prices of petrol and heating oil, than assumed in the February Inflation Report.

The inflation forecast a couple of years ahead therefore remains largely unchanged from the February report. Slightly lower imported inflation is balanced by marginally higher domestic inflation.

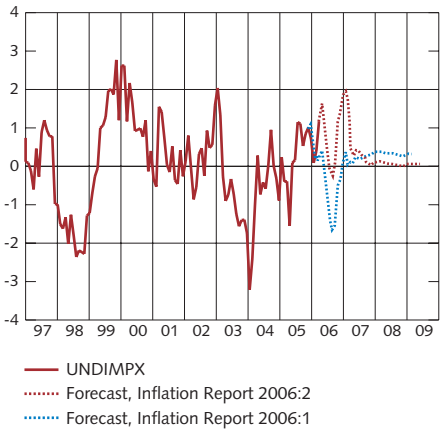
The forecast for imported inflation has been revised downwards due to low price increases on imported manufactured goods in the past few years. The new assessment of a rate of price increase close to zero is in line with how prices have developed on imported goods since 1995 (see Figure 56). This changed view of price increases on imported products is only partly counteracted by the exchange rate now expecting to strengthen at a slightly slower pace than previously.

Domestic inflation is expected to be somewhat higher in the slightly longer term due to the higher energy prices affecting inflation indirectly as well through rising costs for production and distribution.

■■ CPI inflation expected to exceed UND1X inflation.

During the past two years, CPI inflation has been lower than UND1X inflation. This is because falling interest rates have resulted in lower interest costs for homeowners, which affects CPI inflation but not UND1X inflation. During the forecast period, the higher interest rates together with increased energy taxes are instead expected to lead to CPI inflation being higher than UND1X inflation (see Figure 57).

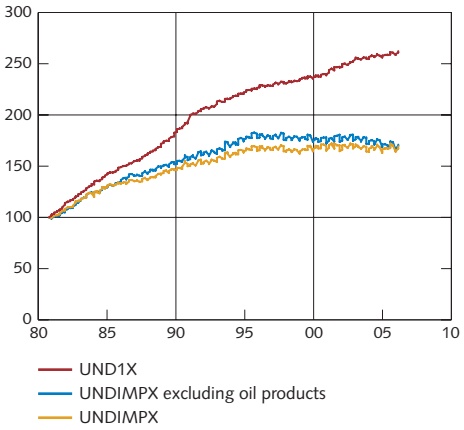
Figure 55. Imported inflation (UNDIMPX)
Annual percentage change



Note. UNDIMPX refers to prices for mainly imported goods and services in UND1X.

Sources: Statistics Sweden and the Riksbank

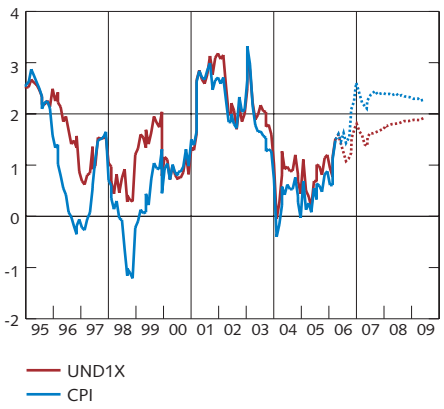
Figure 56. UND1X and UNDIMPX
Index: 1980=100



Note. UNDIMPX refers to prices of mainly imported goods and services in UND1X.

Sources: Statistics Sweden and the Riksbank

Figure 57. CPI and UND1X
Annual percentage change



Note. The broken lines represent the Riksbank's forecasts.

Sources: Statistics Sweden and the Riksbank

Table 8. Inflation forecasts in the main scenario
Annual percentage change

	Annual average				12-month rate			
	2005	2006	2007	2008	June 06	June 07	June 08	June 09
CPI	0.5 (0.5)	1.5 (1.1)	2.3 (2.1)	2.4 (2.2)	1.5 (1.1)	2.3 (2.2)	2.4 (2.2)	2.3
UND1X	0.8 (0.8)	1.3 (0.9)	1.6 (1.5)	1.8 (1.8)	1.4 (0.9)	1.5 (1.5)	1.8 (1.8)	1.9
UNDINHX	1.0 (1.0)	1.5 (1.4)	2.1 (2.0)	2.7 (2.5)	1.6 (1.5)	2.1 (2.1)	2.6 (2.5)	2.8
UNDIMPX	0.2 (0.2)	0.6 (-0.4)	0.6 (0.2)	0.1 (0.3)	1.0 (-0.2)	0.4 (0.3)	0.1 (0.3)	0.0

Note. The figures in parentheses are the forecasts in the previous Inflation Report. UND1X is CPI inflation excluding household mortgage interest expenditure and the direct effects of changes in indirect taxes and subsidies. UNDINHX refers to prices of mainly domestically produced goods and services in UND1X. UNDIMPX refers to prices of mainly imported goods and services in UND1X.

Sources: Statistics Sweden and the Riksbank

Table 9. Change in the CPI compared with UND1X
Annual percentage change and percentage points.

	2005	2006	2007	2008
UND1X	0.8	1.3	1.6	1.8
Effects of changes in mortgage interest expenditure	-0.4	0.1	0.6	0.5
Effects of changes in indirect taxes and subsidies	0.2	0.1	0.2	0.2
=CPI	0.5	1.5	2.3	2.4

Note. The contributions may not sum up due to rounding.

Sources: Statistics Sweden and the Riksbank

Revised forecasts since the February Inflation Report

- Higher energy prices lead to rising inflation. This mainly affects inflation in the short term but also contributes indirectly to slightly higher inflation in the longer term.
- The rate of price increases on imported goods is expected to be slightly lower in the long term than was previously assumed. This revision has been made due to the low outcomes over a long period of time.

Risk assessment

The overall assessment of different risks is that the probability of inflation being lower than in the main scenario is more or less as great as the probability of higher inflation.

The main scenario of the Inflation Report describes the path of inflation assessed by the Riksbank to be the most likely, provided that the repo rate develops in line with the expectations of the financial markets, as reflected in the implied forward rates. However, there is always considerable uncertainty in the assessment and when formulating monetary policy, the Riksbank takes account of the risk that inflation may deviate from the main scenario.

The risk assessment is roughly the same as in the February Inflation Report. This includes risks associated with international economic activity and the high oil price as well as a consideration of how price and wage trends in Sweden will develop in the continued strengthening of economic activity. There are also risks associated with the rapid rate of increase of loans and house prices.

■■ Global imbalances entail risks for international growth.

In the main scenario the upturn in international economic activity is expected to continue during the coming years. Slightly slower growth in the United States is counteracted by stronger growth in the euro area and elsewhere. The large and increasing savings imbalances between the United States and certain Asian and oil-exporting countries constitute a risk that global growth will slow down more quickly. The imbalances will have to be corrected at some time in the future and the main scenario is based on this taking place by a gradual adjustment over a long period towards higher saving in the United States and lower saving in the countries with surpluses. However, there is a risk that the adjustment might be more abrupt, for instance, if there was a sharp decline in the propensity of other countries to invest in US assets. The weakening of the dollar during the spring may be related to uncertainty in the financial markets linked to the deficit in the US current account. Signals have also been received recently that growth in the United States is starting to slow down at a somewhat faster rate, which could mean that the adjustment to increased saving in the US economy has started. If adjustment of the savings imbalances takes place abruptly, this could lead to a rapid rise in US interest rates and a weakening of economic activity in the United States when consumption and investment are dampened. A rapid weakening of the dollar, as part of this adjustment, could brake growth at other places in the world, for instance in the euro area. It is difficult to assess what the overall effects on Sweden would be of this type of rapid change in, for instance, the financial markets. However, one cannot exclude the possibility that it would lead to lower growth and thus lower inflation than in the main scenario.

■■ Uncertainty regarding the oil price and its effects on inflation.

Another risk is associated with the high oil price that has continued to increase since the February Inflation Report. In the main scenario, the oil price is assumed to stabilise substantially at today's high level in line with pricing in the forward market. However, it is basically difficult to predict the future oil price and a continued price rise cannot be ruled out. It is also possible that a greater part of the increase than expected will prove to be due to temporary factors and that the oil price will fall again. Accordingly, there is a risk that an unexpected development of the oil price will lead to lower or higher inflation than in the main scenario through the direct effects that the oil price has on consumer prices.

To date, the oil price has increased at the same time as international growth has developed favourably and inflation excluding energy prices has remained low in most countries. The assessment in the main scenario is that the oil price will give rise to limited inflationary impulses. However, it is conceivable that most of the indirect effects of the high oil price have not yet had an impact on consumer prices and that the effects through more expensive production and distribution costs will be higher than expected in the period ahead. This applies both to the world economy and in Sweden and consequently entails a risk of higher inflation than in the main scenario.

■■ Risk of stronger domestic demand.

Uncertainty over the strength of domestic demand constitutes a small upside risk for inflation. The assessment in the main scenario is that the upturn in Swedish economic activity will continue during the forecast period although it will enter a calmer phase in the near future. However, it is possible that the upturn in economic activity will not slow down as expected. Monetary policy is expansionary even after the interest rate increases. Bearing in mind the low interest rates, the increase in household consumption has been relatively weak in recent years and households still save a relatively high share of their income. If asset prices continue to develop favourably and the labour market improves, it is conceivable that consumption and thus domestic demand will increase more than expected.

■■ Uncertainty regarding wage developments.

In the main scenario, the upturn in economic activity will lead to a continued moderate increase in demand for labour and in wage inflation. However, there is a considerable degree of uncertainty attached to the wage forecast and there is a risk of both higher and lower inflation than in the main scenario. The current labour market situation is, for instance, unusually difficult to interpret due to the change in method of the labour force survey (LFS) last year. Employment has increased in the past year although by just how much is uncertain.

It is also uncertain how a continued improvement in economic activity will affect wage inflation in the future. In the main scenario, the

reduction in employment is limited by an increase in labour supply as more jobseekers enter the labour market. The labour supply is expected to change in the about the same way as in previous business cycles. However, it is possible that the labour supply will rise more this time than in previous upturns, partly due to increased incentives for older persons to start drawing pension at a later age. This may in turn lead to higher unemployment and lower wage increases than in the main scenario. It is also possible that a potential increased labour mobility from low-wage countries in the EU will be a contributory factor leading to lower wage increases than in previous upturns.

However, it is also possible that wage increases will be higher than in the main scenario. The majority of collective agreements will be renegotiated next year, which is expected to be a year with a favourable development of the labour market. It cannot be excluded that bottlenecks that push wages upwards will be created in the economy which will lead to higher pay rises than expected.

■■ Effects of increased competition and other changes on the supply side of the economy.

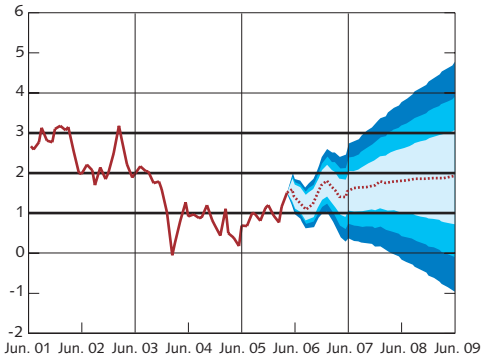
In the main scenario, economic growth remains firm while there is only a moderate increase in inflation. This forecast is based on the low rate of inflation in recent years being partly due to globalisation and stiffer competition. These structural factors are expected to contribute to curbing inflation in the coming years as well. For instance, stiff competition, both globally and in the Swedish market is assumed to have a restraining effect on price increases at various stages of the supply chain. However, it is possible that the inflation-dampening effects of this type of change have been overestimated and that the importance of low resource utilisation in recent years has been correspondingly underestimated. There is therefore a risk that strong demand and rising resource utilisation will lead to higher price and wage increases than expected, particularly in a couple of years from now.

To summarise, the Riksbank makes the assessment that the risks of inflation being lower than in the main scenario are more or less as great as the risks of higher inflation. This assessment is illustrated in Figures 58 and 59, which illustrate the uncertainty surrounding the forecasts of UND1X and CPI inflation.

■■ Risk of growth in loans and house prices.

There may also be grounds for taking into account other risks affecting the stability of the financial markets and the Swedish economy. The risks involved here are very difficult to quantify and pinpoint in time. They are therefore difficult to capture in forecasts for the real economy and inflation in the next few years. However, if it is considered that they could lead to undesirable macroeconomic instability, these risks must be taken into consideration in the monetary policy decisions. In recent years, the rapid credit expansion and high house prices have had some significance for the monetary policy stance.

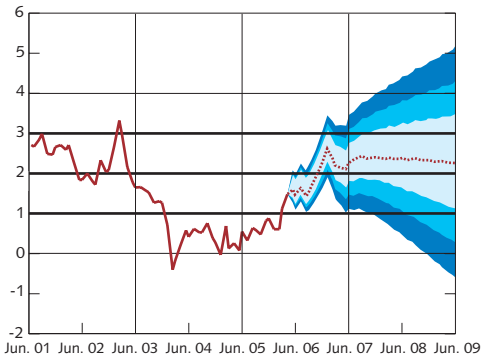
Figure 58. UND1X with uncertainty intervals
Annual percentage change



Note. The uncertainty bands show the 50, 75 and 90 per cent chances of the underlying inflation, UND1X, being within the respective range. The broken line represents the forecast in the main scenario. The horizontal lines at 2, 1 and 3 per cent respectively are the Riksbank's inflation target and the tolerance limits for the annual change in CPI.

Sources: Statistics Sweden and the Riksbank

Figure 59. CPI with uncertainty intervals
Annual percentage change



Note. The uncertainty bands show the 50, 75 and 90 per cent chances of CPI inflation being within the respective range. The broken line represents the forecast in the main scenario. The horizontal lines at 2, 1 and 3 per cent respectively are the Riksbank's inflation target and the tolerance limits for the annual change in CPI.

Sources: Statistics Sweden and the Riksbank

In the Riksbank's main scenario, there is a gradual rise in interest rates which dampens the rate of increase of house prices and lending. However, there is a risk that the expansionary financial conditions in recent years characterised by low interest rates and rising house prices, have led to unduly overoptimistic expectations regarding interest rates and house prices in the future. This could lead to a situation in future with rapid and sharp downward adjustments in expectations and house prices. Households may then find that their debt burden is too high and therefore increase their savings. This could lead to a sharp fall in demand, which can be difficult to manage with economic policy, and lower inflation.

Table 10. Risk-adjusted inflation forecasts
Annual percentage change

	Annual average				12-month rate		
	2005	2006	2007	2008	June 07	June 08	June 09
CPI	0.5 (0.5)	1.5 (1.1)	2.3 (2.1)	2.4 (2.2)	2.3 (2.2)	2.4 (2.2)	2.3
UND1X	0.8 (0.8)	1.3 (0.9)	1.6 (1.5)	1.8 (1.8)	1.5 (1.5)	1.8 (1.8)	1.9

Note. The mean values of the probability distributions for the inflation assessment in Figures 58 and 59. The assessment in the previous Inflation Report is given in parentheses.

Sources: Statistics Sweden and the Riksbank

What is a normal level for the repo rate?

Interest rates in general are currently at historically low levels, both in Sweden and, for example, the euro area. As inflationary pressure rises, interest rates are expected to rise. It is difficult to determine what should be regarded as normal levels for interest rates. The results of this box indicate that a normal level for the repo rate would probably be somewhere in the range 3 ½–5 per cent. However, past experiences show that the repo rate can even fall outside of this rather broad range for fairly long periods of time.

It is difficult to determine exactly what should be regarded as more normal levels for interest rates compared to current levels, but at the same time both interest rate forecasts and inflation forecasts are affected by the assumptions made regarding reasonable long-term levels for nominal and real interest rates. The financial markets tend to look ahead and expectations of the conditions that will apply in the long run also affect the short term. Inversely, long-term interest rates are affected by expectations of how central banks will change their short-term key rates.

One means of determining what might constitute a normal interest rate level is to look at the average over long periods of time. The level of interest rates can be expected to vary over the business cycle, but by examining a sufficiently long period of time that has been characterised by more or less equal periods of economic boom and recession, it should be possible to form an opinion on a normal interest rate level (in a normal economic climate). The nominal interest rate is the equivalent of the real interest rate plus expected inflation. This means that there may be changes in what might be regarded as a normal level of interest rates if long-term changes not related to cyclical activity occur in areas that affect real interest rates or inflation. Changes in monetary policy worldwide have, for example, led to sustainable lower inflation and accordingly lower nominal interest rates compared with 20-30 years ago.

According to economic theory, real interest rates are determined to some extent by growth in the economy and households' time preferences. These time preferences refer to how households value consumption at different points in their life cycle. It is usually assumed that individuals strive for a relatively smooth consumption over time, but also that they have a certain amount of impatience which means they prefer not to postpone their consumption. Thus, an expected future increase in income will lead to an increased demand for loans, which will enable at least part of the future income to be consumed now. The rate of interest the household is willing to pay for the loan depends on the time preference and how rapid growth is expected to be. The higher the growth rate, the more households want to consume now instead of waiting.[10] Economic theory thus indicates that there will be a relatively high real interest rate if growth is high.

In a world with free movement of capital, the nominal interest rate in each country is not determined independently of the rates in other countries. Capital tends to flow to where interest rates are highest, which limits the differences in nominal rates. One means of determining what might constitute a normal nominal interest rate level could be to study how interest rates vary across countries and calculate the average nominal level. However, some differences can persist over a long period of time as a result of different risk and liquidity premiums. While the credit risks for government borrowing within the OECD sphere are small, those related to exchange rate fluctuations can be considerable, at least in the perspective of a few years. In the slightly longer term, however, exchange rate fluctuations and inflation differences tend to offset one another and nominal interest rates in Sweden probably cannot deviate very much from international interest rates after taking

10 For a theoretical discussion of long-term real interest rates, see the box "The concept of a real long-term equilibrium interest rate" in Inflation Report 2000:3 and also Jonsson, M , "The real interest rate and monetary policy", *Economic Review* No. 1, 2002, Sveriges Riksbank.

into account inflation rate differences (that is, real interest rates can be expected to be fairly similar).[11] Given this, interest rate levels that have been common historically may provide an indication of what a normal nominal level should be.

Calculations of a long-term normal interest rate (real and nominal) are made difficult by the fact that major changes in the economy in recent decades have led to long-term relations between various economic variables changing over time. Countries have gradually become more dependent on one another, both as a result of economic growth per se and because of fewer regulations governing international flows of capital, goods and services. In addition, Sweden and many other countries experienced extensive deregulation of their domestic financial markets during the 1980s. Nominal interest rates have also fallen since monetary policy has been aimed at creating a low, stable inflation rate. The extensive changes that have taken place have probably affected the level of what can be regarded as a long-term normal interest rate (both real and nominal) and mean that historical averages of interest rates can be misleading.

Another problem when calculating what might be considered a normal interest rate is that there is no unique, relevant interest rate for each country and each point in time; there is a whole spectrum of interest rates at different levels that depend on the borrower's credit risk, the duration of the loan and the liquidity of the securities (with regard to standardised contracts that can be transferred and traded on the market). The yield curve describes how interest rates on loans are due to the respective duration of the loans. From a monetary policy perspective, the entire yield curve is of interest. Central banks' monetary policy directly governs short-term nominal rates, but the effects of monetary policy on inflation, through for instance consumption and investment, are often assumed to be largely through the more long-term nominal interest rates.

The remainder of this box will give an account of data that can be used to estimate a range for a normal short-term nominal interest rate.[12] As pointed out above, there are many problems with these estimates. The figures must be interpreted with caution and do not provide any clear-cut conclusion.

Empirical estimates

One indicator that gives a rough estimate of a normal real interest rate is the long-term real growth in the economy.[13] Table B1 shows how real GDP growth has varied between different countries and different periods in time.[14] In all countries, growth was higher during the 1960s than it has been since. In the United States, growth in the decades that followed has remained stable at around 3 per cent per year, which is also the unweighted average for all the countries in the table over the entire period since 1960. Table B2 shows that the average growth in consumption across all of the countries in the sample has remained close to the average GDP growth, that is around 3 per cent, during the different decades. However, the differences between the countries are at times substantial and growth in both GDP and private consumption has on average been higher in the United States than, for example, in Germany, the United Kingdom and Sweden.

Table B3 shows that the international interest rate level was relatively low during the 1960s. During this decade inflation was also relatively low, as it has been recently, which

11 For a more detailed discussion of a normal interest rate in an international perspective, see for instance Archibald, J. and L. Hunter, "What is the neutral real interest rate, and how can we use it?", *Reserve Bank of New Zealand Bulletin*, Vol 64, No 3, 2001.
12 For a discussion of the long-term real interest rate, see the box "Real interest rate and monetary policy", in the Inflation Report 2000:1.
13 Standard theories involve growth and the real interest rate normally being fairly similar, but the exact relationship depends on which more specific assumptions are made in the different theories regarding the functioning of the economy. Some theories suggest that what is relevant for real interest rates is not GDP growth as in Tables B1 and B2, but growth per capita. Growth in GDP and per capita consumption are normally 0.5-1.0 percentage points lower than in the Tables B1 and B2.
14 The countries have been chosen arbitrarily but are all market-based OECD economies belonging either to the major countries (the United States, Germany, the United Kingdom) or are countries which introduced inflation targets around the same time as Sweden (Australia, New Zealand). The countries have been chosen to give examples of the state of the economy (and periods of time) characterised by different degrees of dependency on foreign trade, different monetary policy regimes, etc.

contributed to keeping down nominal interest rates. At the same time, the credit markets were strictly regulated then, which means that data from the 1960s cannot be used to determine what might be a normal interest rate level today. The 1970s and 1980s were periods of high inflation, which pushed up nominal interest rates around the world. During the 1980s, credit markets were deregulated and interest rates became more market-based. At the same time, public saving was negative in several countries, which may have contributed to higher real interest rates than in the 1960s and 1970s (see Table B4). In the 1990s the low-inflation policy was established and nominal interest rates returned to lower levels. Initial problems with confidence in the low-inflation policy probably contributed to keeping interest rates up for a period, particularly in Sweden. Since 1998, confidence in the new monetary policy regime can be regarded as having been established in full, making the period from 1998 onwards an interesting one to study from a Swedish perspective.[15] The average short-term nominal interest rate in Sweden has been around 3.3 per cent in recent years. This is marginally higher than in the United States and Germany, but lower than in the United Kingdom, Canada, Australia and New Zealand.[16] The short-term real interest rate in Sweden has in recent years been around the average for the countries in the sample: 2.2 per cent.

Differences in short-term interest rates between different countries during short periods may be justified on the grounds that the economies are in different phases of the economic cycle. A calculation of normal interest rate levels should therefore attempt to include cyclical factors. One simple means of adjusting for cyclical effects is to assume that interest rates are determined by a Taylor rule.[17] This assumes that the central banks will change their instrumental rates with regard to developments in inflation and GDP. The rule states that the central bank should set its rate at the long-term or normal level when inflation is in line with the target level and GDP is at its potential level.

More formally, the Taylor rule states:

$$i_t = i^* + 1.5(\pi_t - \pi^*) + 0.5(y_t - y_t^*) + \varepsilon_t$$

where i is the nominal instrumental rate, i^* is the nominal long-term rate, π is inflation, π^* is the inflation target, y is output, y^* is potential output and ε is a deviation taking into account the fact that the rule does not apply exactly.[18] By putting historical data over nominal instrumental rates (i), deviations from the inflation target ($\pi - \pi^*$) and the output gap ($y - y^*$) in this equation, the normal rate of interest, i^*, can be calculated. The calculation will be an estimate of the central bank's view of the normal rate i^*, given the assumption that the Taylor rule provides a good description of monetary policy.

There are both advantages and disadvantages with using this relatively simple specification for calculating the normal interest rate i^*. On the one hand it is easy to make comparisons when the calculation is made in the same way and using the same simple formula for all countries. On the other hand, the Taylor rule makes too rough an estimate of monetary policy to give a precise measure of the normal instrumental rate, not least because of the major changes in the formulation of monetary policy in recent decades. The relative significance of inflation and real output have probably changed over time, for example. Moreover, the monetary policy conducted now is to a great

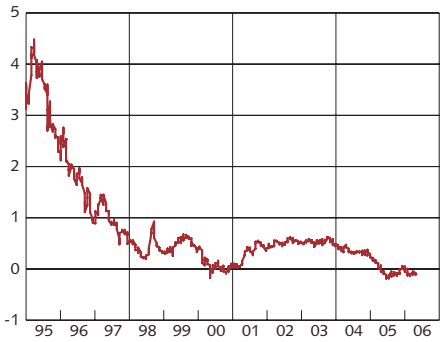
15 Surveys indicate that confidence in the new regime was established in autumn 1996 to the extent that inflation expectations one year ahead were close to 2 per cent. However, pricing in the money market indicates that confidence was first established during early 1998 in that the spread between a Swedish and a German 10-year treasury bond was down to the level that has applied since then, i.e. less than 0.5 percentage points (see Figure B1).

16 The real interest rate calculated ex post, that is, nominal interest rate adjusted for actual inflation rather than expected inflation, gives largely the same picture relative to other countries during 1998-2005. However, Canada's real interest rate was lower than the Swedish rate, which was 2.2 per cent (see Table 4). During the period 1996-2005 the average for the Swedish short-term nominal interest rate was slightly higher than in 1998-2005 (3.6 per cent).

17 See Taylor, J., "Discretion versus policy rules in practice", *Carnegie-Rochester Conference Series on Public Policy* 39, 1993.

18 Taylor's original study used the long-term real interest rate. In the disposition above, a long-term nominal interest rate and a long-term inflation target replace Taylor's long-term real interest rate. Output gaps are calculated using an HP filter on seasonally adjusted real GDP series. The problem of the end-point in the HP estimates is reduced by ensuring that logged GDP series are first forecast using an AR(4) process.

Figure B1. Yield spread between Swedish and German 10-year nominal government bonds
Percentage points



Source: The Riksbank

extent forward-looking and based on forecasts rather than actual observations of the output gap. Despite these objections, the results of the estimates of the normal instrumental rate based on the Taylor rule are interesting. On the whole, the estimates paint the same picture as the nominal rate itself; interest rates have fallen since the 1980s in all countries (see Table B6). In both the United States and Sweden the Taylor rule gives a normal instrumental rate during 1998-2005 that is higher than the average value of the short-term rate according to Table B3. This reflects the fact that both inflation and resource utilisation have been relatively low in the United States and Sweden during this period, and that monetary policy has therefore been more expansionary than the Taylor rule deems normal. The Taylor estimate gives a normal, cyclically-adjusted instrumental rate of 4.6 per cent for the period 1998–2005 in Sweden.[19] This is in the middle of the range for the countries in Table B5 during the period 1998-2005 (3.7–5.7 per cent).

Conclusion and some final observations

The assessments of what is a normal interest rate are uncertain for several reasons. There have been extensive changes in the economy in recent years and it is still difficult to distinguish which changes are long-term or structural changes and which have a more cyclical or temporary nature. The figures reported above can therefore only provide an indication of what is a normal interest rate. The results of this box indicate that the average level of the nominal short-term interest rate in Sweden during 1998–2005, i.e. 3.3 per cent, has been lower than normal, both from a historical perspective and taking account of cyclical effects.

The nominal interest rate is the equivalent of the real interest rate plus expected inflation. Both historically and in international terms, the real interest rate has tended to be close to the trend growth rate of the economy. For Sweden, this means around 3 per cent in the recent past. With a target of 2 per cent inflation, a normal level for the nominal interest rate should thus be around 5 per cent. However, this rough rule of thumb disregards differences between interest rates with different durations. Central banks' instrumental rates are by no means the same as market rates and moreover apply to very short-term loans. They are generally lower than short-term market rates, which in turn have in

Table B1. Average real GDP growth during different periods of time
Per cent

	1960–1969	1970–1979	1980–1989	1990–1999	1998–2005	1960–2005
United States	4.5	3.2	3.0	3.0	3.1	3.3
Germany	4.3	3.1	1.8	1.5	1.3	2.5
United Kingdom	3.0	2.4	2.3	2.1	2.7	2.5
Sweden	**4.4**	**2.4**	**2.3**	**1.7**	**2.9**	**2.6**
Canada	5.4	4.1	3.0	2.4	3.4	3.5
Australia	4.7	3.2	3.3	3.2	3.5	3.5
New Zealand	n.a.	n.a.	n.a.	2.6	3.3	2.7
Unweighted average	4.4	3.1	2.6	2.4	2.9	2.9

Note. For New Zealand, the sample covers 1988-2005.

Sources: US Department of Commerce, UK Office for National Statistics (ONS), Statistics Canada, Australian Statistician, Statistics New Zealand, Statistics Sweden, Federal Statistical Office Germany

19 Calculated using quarterly data, the inflation gap in 1998-2005 averaged -1.0 percentage points. During the same period the repo rate averaged 3.2 per cent. If the Taylor approach is based on the period 1996-2005, the estimate of the equilibrium interest rate will be 5.3 per cent.

recent times often been below 5 per cent (see Table B3). Estimates of Taylor rules normally yield instrumental rates of 3.7-5.7 per cent (see Table B5), which should, however, be interpreted with some caution given that both central banks' inflation targets and the output gap can be difficult to measure. All in all, the figures reported in this box indicate that a normal level for the repo rate is estimated to be in the range 3½–5 per cent, but as can be seen from the present circumstances and past experiences in Sweden and other countries, the repo rate can fall outside of this rather broad range for fairly long periods of time.

Table B2. Average real consumption growth during different periods of time
Per cent

	1960–1969	1970–1979	1980–1989	1990–1999	1998–2005	1960–2005
United States	4.5	3.4	3.2	3.2	3.7	3.5
Germany	n.a.	n.a.	n.a.	1.7	1.0	1.3
United Kingdom	2.3	2.6	3.3	2.2	3.4	2.7
Sweden	**3.6**	**2.1**	**1.7**	**1.0**	**2.4**	**2.1**
Canada	4.6	4.2	2.7	2.1	3.3	3.3
Australia	4.5	3.5	3.1	3.2	4.0	3.6
New Zealand	n.a.	n.a.	n.a.	2.5	3.8	2.9
Unweighted average	3.9	3.2	2.8	2.3	3.1	2.8

Note. For New Zealand, the sample covers 1988 onwards and for Germany, 1992 onwards.

Sources: US Department of Commerce, UK Office for National Statistics (ONS), Statistics Canada, Australian Statistician, Statistics New Zealand, Statistics Sweden, Federal Statistical Office Germany

Table B3. Average nominal yield on a 3-month treasury bill during different periods of time
Per cent

	1960–1969	1970–1979	1980–1989	1990–1999	1998–2005	1960–2005
United States	4.0	6.3	8.8	4.9	3.1	5.0
Germany	n.a.	4.8	6.0	5.4	3.2	5.6
United Kingdom	6.2	8.9	11.4	7.9	5.0	8.3
Sweden	**5.5**	**6.4**	**11.7**	**8.0**	**3.3**	**7.4**
Canada	4.4	7.0	11.3	6.2	3.6	6.7
Australia	n.a.	8.7	14.5	7.2	5.2	9.3
New Zealand	n.a.	n.a.	14.6	8.1	6.0	8.2
Unweighted average	5.0	7.0	11.2	6.8	4.2	7.2

Note. The series of 3-month yields are often incomplete. For Germany the series starts in July 1975, for the United Kingdom in January 1964, for Sweden in December 1962. For Australia the 3-month yield is a bank bill and the series begins in June 1969. For New Zealand the 3-month yield is a deposit rate that begins in December 1987.

Sources: OECD, Federal Reserve, Statistics Sweden, Reserve Bank of Australia, Bank of Canada, Reserve Bank of New Zealand

Table B4. Average ex post real yield on a 3-month treasury bill during different periods of time
Per cent

	1960–1969	1970–1979	1980–1989	1990–1999	1998–2005	1960–2005
United States	1.7	-0.5	3.5	1.9	0.8	1.4
Germany	n.a.	0.9	3.2	2.9	1.8	2.4
United Kingdom	2.2	-2.9	4.3	4.3	2.6	2.0
Sweden	**1.7**	**-1.8**	**4.0**	**4.8**	**2.2**	**2.2**
Canada	1.9	0.0	5.0	4.1	1.5	2.5
Australia	n.a.	-0.5	6.5	4.7	2.6	3.3
New Zealand	n.a.	n.a.	8.5	6.0	4.1	5.5
Unweighted average	1.9	-0.7	5.0	4.1	2.2	2.8

Note. Short-term real interest rate is defined as the yield on a 3-month treasury bill minus the average annual inflation over the past 12 months. The series of 3-month yields are often incomplete. For Germany the series starts in July 1975, for the United Kingdom in January 1964, for Sweden in December 1962. For Australia the 3-month yield is a bank bill and the series begins in June 1969. For New Zealand the 3-month yield is a deposit rate that begins in December 1987.

Sources: OECD, Federal Reserve, SCB, Reserve Bank of Australia, Bank of Canada, Reserve Bank of New Zealand, Statistics Canada, Australian Bureau of Statistics, Statistics New Zealand, OECD, UK Office for National Statistics (ONS)

Table B5. Calculated nominal long-term key rate based on a Taylor rule during different periods of time
Per cent

	1960–1969	1970–1979	1980–1989	1990–1999	1998–2005	1960–2005
United States	4.2	7.1	10.0	5.0	4.3	6.2
Germany	4.1	5.3	5.7	5.7	4.4	5.1
United Kingdom	6.0	9.4	11.4	8.2	5.3	8.4
Sweden	**5.1**	**6.3**	**9.3**	**5.8**	**4.6**	**7.4**
Canada	n.a.	n.a.	n.a.	5.8	3.7	4.6
Australia	n.a.	n.a.	11.8	9.6	4.7	9.3
New Zealand	n.a.	n.a.	18.8	11.4	5.7	10.8
Unweighted average	4.9	7.0	11.2	7.4	4.7	7.4

Note. Inflation targets prior to the introduction of quantitative targets are defined as the current decade's inflation average in the respective country. For instance, the inflation target during the 1960s is set at 2.3 per cent in the United States, which is the average for US inflation measured as a 4-quarter change in CPI during the period Q1, 1960 – Q4, 1969. For Canada the sample covers 1992 onwards, for Australia 1980 onwards and for New Zealand 1987 onwards.

Sources: OECD, Federal Reserve, Statistics Sweden, Reserve Bank of Australia, Bank of Canada, Reserve Bank of New Zealand

Resource utilisation, costs and inflation

The aim of this box is to illustrate the relationship between resource utilisation, cost levels and inflation. An important message is that there are no simple correlations between these variables. For instance, resource utilisation is not a quantity that can be directly observed and no clear definition is provided in economic theory. Resource utilisation can accordingly be measured in different ways and different measures do not produce an entirely clear-cut picture. The correlation between resource utilisation and inflation is moreover affected by the disturbances the economy is exposed to. For instance, the Swedish economy has been exposed to a number of "positive supply shocks" which have led to falling inflation and cost levels without resulting in a corresponding fall in resource utilisation.

Changes in the inflation rate are correlated with resource utilisation and/or cost levels in the economy. This view often characterises analyses that serve as the basis for forecasts and assessments of the best formulation of monetary policy. In economic studies, the correlations between inflation, resource utilisation and the cost levels are often described in terms of some variant of the Phillips curve.

According to modern "Neo-Keynesian" theory, inflation depends on inflation expectations and firms' marginal costs. In principle, the Phillips curve then has the following appearance:

$$\pi = a \cdot \pi^e + b \cdot mc,$$

where π denotes inflation, π^e households' and firms' expectations of inflation, *mc* a measure of firms' costs to increase production (their real marginal cost), and *a* and *b* are parameters with a positive value which depend on a number of different factors that affect the functioning of the economy, e.g. the degree of price rigidity. Neo-Keynesian theory thus stresses the cost situation (more specifically, the firms' real marginal cost) as a key determinant of the rate of inflation. A key assumption underlying this theory is that firms, for various reasons, choose not to change their prices for long periods of time. However, when they eventually do change a price, they take into consideration what they expect inflation and their production cost to be in the future, i.e. during the period that the price is to be unchanged.

The Neo-Keynesian Phillips curve is reminiscent of the traditional Phillips curve. The difference is that the Neo-Keynesian theory emphasises the firm's costs while the traditional theory emphasises resource utilisation as the central determinant. The traditional Phillips curve is usually described as follows:

$$\pi = \pi^e + c \cdot y,$$

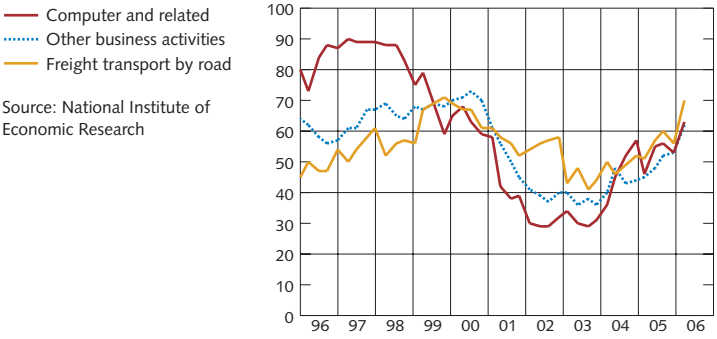
where *y* is a measure of resource utilisation and *c* a parameter larger than zero. According to the traditional Phillips curve, inflation is determined by resource utilisation and inflation expectations.[20]

The difference between the Neo-Keynesian and the traditional Phillips curves is not necessarily so great, since there is some correlation between the firms' real marginal cost and the degree of resource utilisation.[21] In practice, it is difficult to measure both resource utilisation and cost levels. There are a number of different measures with more or less strong theoretical and empirical support.

One commonly used way of describing resource utilisation is to measure the difference between the actual level of output, GDP, and some conceivable trend level. The trend level can, in turn, be calculated in various ways and is occasionally labelled "potential" GDP or "the long-term sustainable" GDP level. The difference

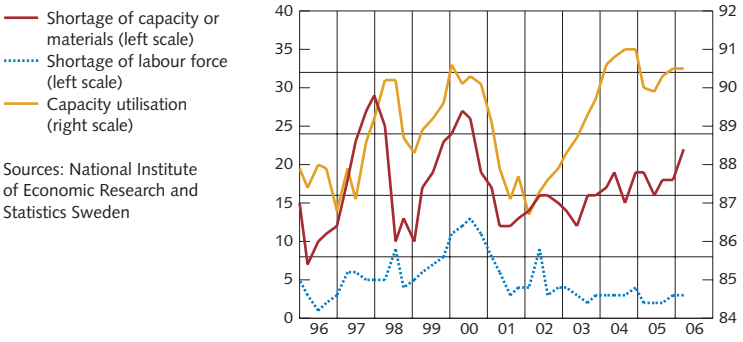
20 A description of the traditional Phillips curve can be found in any basic textbook such as Mankiw G., *Macroeconomics*, Worth Publishers, 2002.
21 According to Neo-Keynesian theory, a direct and simple relationship only exists in certain conditions. This is the case, for instance, if no capital accumulation takes place in the economy and if wages are completely flexible. See also Galí, J. Clarida, & M. Gertler, "The Science of Monetary Policy: A New Keynesian Perspective", *Journal of Economic Literature* 37, 1999 for a description of the Neo-Keynesian theory and the correlation between real marginal cost and resource utilisation.

Figure B2. Proportion of firms with full capacity utilisation in three service industries
Per cent



Source: National Institute of Economic Research

Figure B3. Bottlenecks and capacity utilisation in the manufacturing sector, proportion of companies
Per cent, seasonally adjusted data



Sources: National Institute of Economic Research and Statistics Sweden

between actual and trend GDP is referred to as the "output gap" in this context. It is also common for resource utilisation in the economy to be measured by an estimate of the amount of spare capacity in the labour market or the utilisation of existing production capacity in the form of machinery and buildings in firms (e.g. through surveys).

Resource utilisation is not a quantity that can be directly observed and no clear definition is provided in economic theory. Moreover, historical data are often subsequently revised. The picture of how high capacity utilisation was at a particular point in time can look different when new data are received and earlier data revised. This applies both for measures based on GDP data and measures based on the rate of utilisation of production factors.

In the remaining part of this box, some common measures of resource utilisation are first shown at the same time as an assessment is made about what these measures say about the present cyclical conditions. Subsequently, the historical correlations between inflation, resource utilisation and cost levels are shown.

Resource utilisation from a historical perspective

Figures B2–B4 show how different measures of resource utilisation in the Swedish economy have developed during the past decade. Figures B2 and B3 show the degree of resource utilisation in several service industries and the manufacturing industry, according to surveys. The figures show that the level of economic activity peaked during 2000 and subsequently slackened off. At the end of 2003 and the beginning of 2004, resource utilisation, measured in these ways, started to rise again. However, the picture is not entirely clear-cut. Firstly, it is unclear how the level of resource utilisation currently relates to the last peak in 2000. According to a couple of indicators, resource utilisation is approximately as high now as it was then, although the overall picture is none the less that there is far more spare capacity than in 2000. Secondly, the picture of resource utilisation changes if one looks at the shortage of labour in industry (in Figure B3), which is still low.

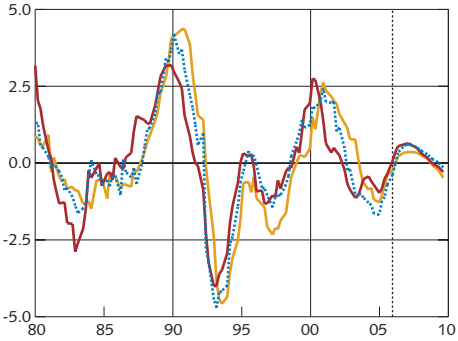
Figure B4 shows how GDP, employment and the number of hours worked deviate from their respective trends in the past 25 years.[22] The exact dates of the peaks and troughs differ between the series, although all in all they produce a rather coherent picture. Once again, we obtain a picture of a cyclical stage which peaked around 2000 and then slackened off. It is worth noting that there is a slight time lag in the turning points in the labour market in relation to production. The overall picture is that resource utilisation is lower than in 2000. This year was characterised by an upturn while

22 Trend deviations have been calculated by an HP filter. Series which have been decomposed have been extended with the Riksbank's forecasts for 2006–2009.

the situation in 2006 may, if the forecasts are accurate, be considered as being approximately normal (average).[23]

To sum up, utilisation of economic resources has increased in Sweden in recent years and is presently continuing to increase. From a historical perspective, the situation in 2006 can be described as being about normal. In manufacturing industry, the shortage of labour is as low as in the mid-1990s, although other measures and the situation in other industries indicate higher resource utilisation. Total employment and hours worked are not obviously below long-term trends even though this conclusion naturally depends on how one decides to calculate the trends.

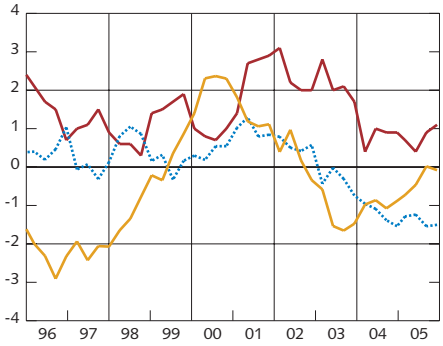
Figure B4. GDP, employment and hours worked
Percentage deviation from the trend



Note. Unbroken line after the vertical broken line refers to forecasts.

Sources: Statistics Sweden and the Riksbank

Figure B5. UND1X and the model-based measure of output gap and marginal cost
Percentage deviation from trend (gap and cost) and annual percentage change respectively (UND1X)



Source: The Riksbank

Resource utilisation and costs

While several different measures of resource utilisation in the economy indicated stronger economic performance in 2004 and 2005, inflation has been low. Initially, it was noted that Neo-Keynesian theory emphasises cost levels as an important driving force for inflation.

Figure B5 shows the actual development of inflation measured by UND1X (quarterly data) together with model-based measures of the marginal cost and output gap.[24] Marginal cost is calculated as the real labour cost per unit produced, which in the model is the same as labour costs in relation to GDP. The output gap is calculated as the difference between actual GDP and GDP in long-term equilibrium (steady state). When calculating this measure, the long-term trend of the GDP growth rate has been permitted to vary over time.[25]

To start with, it can be noted that the measure chosen for the output gap will produce approximately the same picture as the above measure in Figures B2-B4. Moreover, in Figure B5 the correlation between inflation and the output gap in the same quarter is lower (0.15) than the correlation between inflation and cost pressures (0.35). The correlations are stronger looking at inflation in a particular quarter and cost pressures or the output gap a few quarters earlier. According to Figure B5, there seems on average to have been positive correlations in such a way that a rising output gap or cost levels has been accompanied by rising inflation. However, during 2004 and 2005, cost levels fell and the output gap increased.

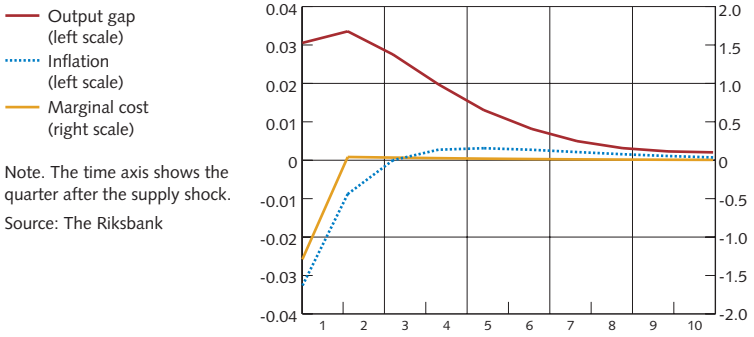
According to economic theory, one should not expect stable correlations over time, but the strength of the correlations will depend on what happens to inflation expectations and the

23 There are a lot of different approaches in economic theory to the meaning of a "normal" level of economic activity. It may, for instance, mean "equilibrium", "stable prices", etc. See Rogerson R., "Theory ahead of language in the economics of unemployment", *Journal of Economic Perspectives* 11, 1997 for a discussion on this topic. The concept of normal is used in this box to describe a situation where the economy is in neither a boom nor a recession.

24 For a description of the model, see Adolfson, M., S. Laséen, J. Lindé and M. Villani, "Bayesian Estimation of an Open Economy DSGE Model with Incomplete Pass-Through", *Sveriges Riksbank Working Paper Series* No. 179, 2005.

25 The output function in the model is given by $Y = \varepsilon \cdot z^{1-\alpha} \cdot K^{\alpha} \cdot H^{1-\alpha} - \phi$, where Y denotes GDP, z a permanent productivity shock, ε a temporary productivity shock, K input of capital services, H number of hours worked, ϕ a fixed production cost and α a parameter. The output gap is calculated as the difference between actual GDP and GDP in long-term equilibrium (steady state) $ln\ Y - ln\ Y^*$, where Y^* denotes the trend (steady state) level of GDP. Note that the output gap is affected by disturbances to the long-term trend in GDP since z varies over time.

Figure B6. Inflation, output gap and marginal cost after a temporary productivity increase
Percentage deviation from the trend



Note. The time axis shows the quarter after the supply shock.
Source: The Riksbank

disturbances the economy is exposed to. This is one reason why there is no simple empirical correlation between resource utilisation and inflation. The same applies, of course, to the correlation between inflation and real marginal cost. When interpreting economic development, it is therefore important to identify the type of disturbance that has affected the economy at different times.

The present situation in Sweden, with an approximately normal resource utilisation at the same time as cost pressures and inflation are unusually low, is easier to understand if, in line with Neo-Keynesian theory, changes in supply conditions are taken into consideration as a driving force for development.[26] Figure B6 shows model-based calculations of how inflation, real marginal cost and the output gap are affected by a temporary increase in the level of productivity. This increase in productivity is temporary insofar as productivity returns to its normal level after a while. The increase in productivity reduces the firms' costs leading to falling prices. Since the disturbance is temporary, the long-term trend equilibrium of GDP is not affected. The increased production opportunities therefore lead to an increase in both output and the output gap. The correlation between inflation and the output gap will thus be negative in this case and not positive as in traditional explanations of the Phillips curve relationship. This example illustrates that upturns in productivity could be a reason why inflation has remained at a low level while cyclical conditions have generally improved. However, this does not mean that changes in demand do not have any effects on inflation and the level of economic activity.

Conclusion

To sum up, the correlation between inflation, the cost levels, and different measures of resource utilisation, both theoretical and empirical, are discussed in this box. Important messages have been that there are no simple correlations between inflation, cost levels and resource utilisation, and the correlation between different economic variables depends on the disturbances the economy is exposed to. In recent years, inflation has been low at the same time as various measures of resource utilisation have indicated an upturn. This suggests that inflation in Sweden is affected by changes in the supply side of the economy, including increased productivity (technological improvements) and not just by the demand situation.

There are of course other circumstances that are important to bear in mind when interpreting the Swedish inflation path. The low cost pressure in Sweden not only depends on high productivity but also on wage increases being low from a historical perspective. This in turn is connected with the relatively low resource utilisation in the labour market which in turn depends on the good productivity development and previous weakening of economic performance in Sweden and internationally. In recent years, the path of inflation has also been affected to a large extent by low import prices. Sweden is a small open economy where around one-third of household consumption is imported and therefore import prices are an important explanatory factor.

26 Inflation expectations are a determinant for the inflation path in both the Neo-Keynesian and the traditional Phillips curve. During the past six years, however, the determinants of inflation two years ahead have been relatively constant at around 2 per cent. This indicates that the inflation outcomes in recent years cannot be explained by changes in households' and firms' inflation expectations.