Sveriges Riksbank Inflation Report June 1999

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Foreword

Monetary policy is targeted at keeping inflation at 2 per cent, with a tolerance for deviations up to ± 1 percentage point.

The purpose of the Inflation Report is to provide a basis for monetary policy decisions and to make our deliberations known to a wider public, so that monetary policy is easier to follow and understand. The Report is also intended to encourage a discussion of matters relating to monetary policy.

The arrangement of this Report is somewhat different from the March issue. Chapter 1 concentrates on developments in prices and in financial markets since the previous Report. The main factors that will be determining the path of inflation in the coming twenty-four months are considered in Chapter 2, which is structured to follow a simple inflation model so as to clarify the importance of these factors. Chapter 3 summarises the Riksbank's assessment of inflation prospects. The Report also contains a number of boxed texts, the purpose of which is to provide more detailed insights into matters of importance for inflation assessments and the formation of monetary policy. Some of the underlying statistical material is presented in an annex.

The Report reproduces the basic features of the presentations and discussions of inflation at the Executive Board meetings on 20 and 27 May 1999. It accordingly formed the background to the Board's monetary policy decision on 2 June 1999; the minutes of that Board meeting will be published in 2 August 1999.

Stockholm, June 1999

Urban Bäckström Governor of Sveriges Riksbank

Summary

■ The paths of consumer prices and underlying inflation since the March Report have been broadly as expected. In April 1999 the annual rate of CPI inflation was −0.1 per cent. The weak consumer price tendency is mainly a consequence of transitory effects from changes in indirect taxes, subsidies and interest expenditure. The underlying rate of inflation measured as UND1X, which excludes these transitory factors, was 1.4 per cent in April.

This Report presents the Riksbank's appraisal of inflation up to the end of 2001 Q2. In that the analysis is based on an unchanged repo rate, it elucidates the consequences for monetary policy. The most important determinants of inflation are then assessed and a main scenario for the path of inflation is presented, together with an appraisal of risks.

The main factors behind inflation are:

International economic activity and inflation. The picture of international activity is broadly unchanged. Some slowdown is foreseen during 1999 in the wake of the Asian crisis, followed by a successive recovery in the coming two years. During the spring, however, international economic prospects have become more favourable, above all as a result of a continuation of the strong trend in the United States. The first economies to be hit by the Asian crisis are gradually starting to recover. In the euro area, on the other hand, manufacturing activity has weakened and there are few signs of a rapid recovery. Notwithstanding the somewhat stronger growth prospects in the OECD area and rising oil prices, however, external inflationary pressure via import prices is judged to be only a little higher than was foreseen at the time of the March Report.

Demand relative to supply. The weak international trend, above all in Europe, is expected to subdue Swedish exports and investment in 1999. But activity in the Swedish economy in the forecast period is judged to be somewhat stronger than was assumed in March. Low interest rates are expected to contribute to a successive increase in domestic demand. Together with an upward tendency in international activity, this is taken to mean that GDP rises 2.5 per cent in 1999 and 3 per cent in both 2000 and 2001. There is still a comparatively large stock of unutilised resources in the economy, but it will probably be utilised successively in the coming 24 months, which is likely to entail somewhat higher inflationary pressure. The deregulation of the electricity and telephone markets, accompanied by changes in agricultural subsidies as proposed in the EU's Agenda 2000, are calculated to exert somewhat stronger downward pressure on prices than was assumed in the March Report. These factors partly counter the increase in underlying inflation associated with improved economic prospects.

Inflation expectations show some increase but the level is still low. Inflation is expected to be below 2 per cent in the coming twenty-four months. Further ahead, the expectations are in line with the target.

Transitory factors. Changes in indirect taxes, subsidies and house mortgage interest expenditure are judged to have downward CPI effects of 0.8 percentage points in twelve months time and 0.3 percentage points twenty-four months ahead. In the present situation these factors are disregarded in the formulation of monetary policy because they are judged to have no permanent effect on inflation or inflation expectations. This means that in practice monetary policy is currently based on an assessment of inflation as measured by UND1X. ■ With the improved economic prospects, underlying inflation in the main scenario is judged to be somewhat higher than was foreseen in the March Report. The rate of UND1X inflation, which excludes changes in indirect taxes, subsidies and interest expenditure, is judged to be 1.9 per cent twelve months ahead and 2.0 per cent after twenty-four months. CPI inflation is judged to be below the target, with rates of 1.0 per cent twelve months ahead and 1.6 per cent in twenty-four months time. The assessment of consumer price tendencies is thus much the same as in the March Report.

■ The risk spectrum must also be considered when monetary policy is formulated. There is still a risk of falling stock markets in the United States. But the global financial unrest has subsided and a recovery is becoming discernible in parts of Asia. This reduces the risk of a more lengthy and deeper international slowdown. Another risk concerns the oil price rise, which could continue at a faster rate than is assumed in the main scenario. Neither can one rule out domestic demand growth that is stronger than in the main scenario. Fiscal policy is an important factor here. The main downside risk has to do with the fact that in recent years inflation, in Sweden as well as internationally, has been lower than historical relationships indicated. This may indicate that the tradeoff between growth and inflation is lower than assumed in the main scenario. All in all, the risk spectrum is judged to be symmetrical around the main scenario.

■ The conclusion from the reported assessments is that, excluding transitory effects from changes in indirect taxes, subsidies and interest rates, and given that the repo rate remains unchanged at 2.90 per cent, inflation twelve to twenty-four months ahead will be marginally below the Riksbank's target. But the deviation is small, particularly when the altered risk spectrum is taken into account. The risk spectrum now appears to be fairly well balanced around the main scenario. Chapter 1

Developments since the March Report

Economic developments since the previous report are discussed in this chapter, starting with the picture of inflation in recent months and concluding with an account of recent movements in interest rates, the exchange rate and various money and credit aggregates.

Prices

From March to April 1999 the consumer price level rose 0.2 per cent. However, the 12-month change in April was –0.1 per cent, which is a somewhat weaker tendency than was forecast in the March Report. The effect of lower mortgage interest expenditure was about 0.1 percentage points lower than expected, while the import price tendency was somewhat underestimated.

The consumer price tendency has been somewhat weaker than expected.

Underlying inflation as measured by UND1X has been somewhat stronger than assessed in the March Report; the 12-month change in April was 1.4 per cent. The price rise for goods that are mainly imported exceeded expectations, mainly due to the recent price increases for petroleum-related products. Domestic prices, on the other hand, have

Figure 1. CPI and underlying inflation. Percentage 12-month change



Note. UND1X is defined as the CPI excluding interest expenditure and direct effects of altered indirect taxes and subsidies; UNDINHX is the CPI excluding interest expenditure, goods that are mainly imported and direct effects of altered domestic indirect taxes. The horizontal lines from 1995 onwards display the Riksbank's tolerance interval for the annual change in the CPI.

Inflation in Sweden has recently been lower than in most other EU countries. In April the 12-month change in HICP, the internationally harmonised index of consumer prices, was 0.3 per cent. Low import prices and reduced indirect taxes offset rising prices for services, for instance.

For goods that are mainly imported, the price level excluding taxes in April 1999 was 0.3 per cent lower than a year earlier. In recent months, however, the price level has moved up appreciably, mainly due to price increases for oil and clothing. But the 12month price change for other consumer goods is still negative. One example is the steep price fall for computers (-34 per cent in the past twelve months), which is partly a consequence of the rapid evolution of this technology.

The fall in house mortgage interest expenditure has been somewhat greater than was assumed in the March Report. This is mainly explained by the Riksbank's repo rate cut at the end of March. For the 12month CPI change in April, the decline in this expenditure had a downward effect of 0.8 percentage points. Indirect taxes and subsidies have been altered substantially in the past twelve months. These changes, including the freeze on assessed property values, had a downward effect on CPI inflation in April of 0.5 percentage points. All in all, decreased interest expenditure and changes in indirect taxes and subsidies lowered CPI inflation in April by 1.3 percentage points.

To sum up, the consumer price tendency in recent months has been somewhat weaker than was expected in the March Report. The Riksbank's reduction of the repo rate meant that mortgage interest expenditure has been somewhat more subdued than foreseen, while underlying inflation has been somewhat stronger.

PRODUCER PRICES FALLING

The producer price level, which is a weighted sum of export and home market prices, continued to fall in 1999 Q1. The decline was more marked than a year earlier; the 12-month change in March was -2.7 per cent. Considerable price reductions have been noted above all for minerals and fabricated steel and metal products.

The weak producer price tendency comes mainly from lower export prices, which is partly explained by the exchange rate's relatively market appreciation in this period.¹ A breakdown by use cat-

Figure 2. HICP for Sweden, euro area and EU high and low. Percentage 12-month change



Note. EU high and EU low show the highest and lowest current national figure, respectively, among the EU countries apart from Greece. Sources: Eurostat and Statistics Sweden.

| Table 1. | | JanMarch | 12-m. to Jan. | 12-m. to March. |
|---|---------------------------------|----------|---------------|-----------------|
| Price indexes for manufacturing 1999 | Export price index | -1.8 | -1.9 | -3.4 |
| Percentage change | Home market price index | -0.3 | -1.5 | -1.7 |
| | Import price index | -1.2 | 0.1 | -1.2 |
| | Price index for domestic supply | -0.8 | -0.8 | -1.5 |
| | Producer price index | -1.2 | -1.8 | -2.7 |

Source: Statistcs Sweden.

egories shows that the negative trend this year and on a 12-month basis is mainly due to steeply falling prices for intermediate goods and to some extent to decreased prices for investment goods.

Unlike export prices, home market prices have declined only marginally in recent months. The latest 12-month change figure, however, is about -1.7 per cent, mainly due to the price fall for intermediate goods. Energy-related products have also contributed to this downward trend, despite the recent increase in oil prices.

The difference between consumer and producer price tendencies for consumer goods is considerably smaller than earlier this year.

Import prices to producers fell sharply from January to February 1999, to a considerable extent on

account of the krona's appreciation in January; the price level then rose again from February to March, partly in connection with higher prices for energy-related products. The 12-month change in March 1999 was about –1.2 per cent, whereas the change had been slightly positive as recently as in January. The downturn came mainly from lower prices for imported consumer goods. It also means that the different tendencies in consumer prices compared with producer prices for imported consumer goods have been substantially reduced (Fig. 10).

Producer prices for consumer goods destined for the home market have been a good indicator of con-

1 The exchange rate used by the Board of Customs.

Figure 3. CPI effects of changes in indirect taxes, subsidies and house mortgage interest expenditure. Percentage points



Sources: Statistics Sweden and the Riksbank.

sumer prices a few months ahead. In March this index rose only 0.4 per cent (Annex: Fig. 4) and accordingly points to a continuation of low consumer price increases for goods.²

The 1999 Q1 business tendency survey from the National Institute of Economic Research shows that firms are planning for a continuation of decreased prices in the coming months, above all in export markets. Moreover, the Q1 producer price increases for consumer goods were less than firms had planned. Q2 price increases are planned by a limited proportion of firms. For service sectors, the price level was largely unchanged in 1999 Q1 and future price increase are planned by just a few service industries.

COMMODITY PRICES

The level of commodity prices has risen this spring on account of the strong increase in the price of crude oil. The OPEC agreement on 23 March to cut production as of April by about 2 million barrels a day was already affecting oil prices in March. Since the March Report, the barrel price of Brent oil has moved up about 20 per cent to USD 14.7. and this has left its mark on prices for petrol and heating oil. In March and April the price of petrol rose substantially, which to date has added about 0.2 percentage points to CPI inflation. Basic metals prices have also moved up about 16 per cent since the March Report, partly due to expectations of stronger international activity. The price rise has not included all commodities. The price of coffee, for example, has fallen about 15 per cent to date this year.

Prices for Sweden's main export commodities show different tendencies. The price of iron ore has dropped sharply and is now at the level from 1993. The 12-month change in pulp prices was still negative in mid March but this was followed by a strong price rise up to the end of April.

To sum up, the producer price tendency for goods (excluding energy-related products) has been weaker than expected, which suggests a restrained development of consumer prices in the coming months. The recent unexpectedly strong increase in oil prices has, however, affected consumer prices for petrol and heating oil.

2 Measured by the price index for the domestic supply of consumer goods, which is a weighted index of producers' import and home market prices.

Figure 4. Consumer and producer prices for goods. Percentage 12-month change



Sources: Statistics Sweden and the Riksbank.

CPI BELOW LOWER TOLERANCE LIMIT

The tolerance interval surrounding the Riksbank's inflation target reflects the fact that monetary policy is not capable of controlling inflation in the short run. In connection with unforeseen commodity price falls or tax changes, moreover, inflation figures outside this interval cannot be excluded either. All this is a consequence of the time lag before an unexpected inflation trend can be countered with monetary measures. Transitory effects should therefore be a secondary consideration both in the formulation of monetary policy and in its subsequent appraisal. It follows that monetary policy and inflation target fulfilment ought to be appraised, not from isolated monthly figures but in a longer, annual perspective.

In the period since January 1995, when the inflation target began to apply, the annual rate of CPI inflation has averaged 1.1 per cent, which is below the target but inside the tolerance interval. Underlying inflation has been higher; in this period the change in UND1X has averaged 1.7 per cent and UNDINHX 2.3 per cent. On average, then, effects of changes in interest expenditure, indirect taxes and subsidies, and prices of goods that are mainly imported have had a very marked downward impact on the path of the CPI.

In April 1999 the 12-month rate of CPI inflation was -0.1 per cent and thus still outside the lower tolerance limit. Factors behind the low rate included effects of approximately -0.8 percentage points from falling house mortgage interest costs and another -0.6 percentage points from decreased indirect taxes and subsidies.

While inflation's underlying trend has also been weak, it is appreciably above CPI inflation. In April the 12-month change in UND1X was 1.4 per cent. Moreover, excluding the effect from prices of goods that are mainly imported, the underlying domestic rate in April, measured as UNDINHX, was 2.1 per cent.



Interest rates, exchange rate and money supply

BOND RATES STILL LOW

Long bond rates have fallen by degrees in recent years, in Sweden as well as abroad. Important domestic factors behind the lower interest rates in Sweden are the consolidation of government finances and a successive enhancement of confidence in monetary policy's commitment to price stability, which among other things has lowered inflation expectations.

Even with the recent upward tendency, the level of Swedish long bond rates is still historically low.

After the publication of the March Report, Swedish long bond rates went on falling; recently, however,

they have turned upwards again, mainly in connection with the global increase, occasioned primarily by signs that the strong trend in the US economy is continuing. But even with the recent upward tendency, the level of the Swedish ten-year rate is still historically low, around 4.5 per cent (Annex: Fig. 10). The corresponding euro rate has risen about as much. The interest rate differential is accordingly unchanged at around 0.4 percentage points (Annex: Fig. 11). A differential of this magnitude is a sign that confidence in the Swedish economy among players in financial markets is still good.

In the United States, bond rates have gone on rising since the March Report, so that during 1999 the differential with euro rates has widened by about 0.5 percentage points. This probably reflects the relatively stronger economic growth in the American economy. Swedish interest rates have largely followed the euro rates, which is to be expected in the light of

MONETARY POLICY'S ECONOMIC IMPACT

The Riksbank's main monetary policy instrument is the repo rate, which is the short-term rate for the private banks' deposits in and borrowing from the Riksbank. Simplifying somewhat, the Riksbank influences other interest rates in Sweden by altering the repo rate. Via these market interest rates an influence is exerted in turn on economic activity, for example business investment and household consumption, and thereby ultimately on price formation. However, the effect of the Riksbank's actions is not the same for every type of interest rate. The rates with the shortest maturities are controlled by the repo rate more or less directly, while those with longer maturities are also influenced by factors that the Riksbank does not control directly, for example the construction of fiscal policy, the development of international interest rates and the credibility of economic policy's overall commitment to price stability. It should also be noted that households and most firms finance their procurements and consumption mainly at interest rates above the quoted market rates. The loans are usually

provided by banks and house mortgage institutions at rates that to some extent mirror credit risks and competition between different institutions.

Monetary policy also influences the course of inflation via the exchange rate because exchange rate movements have effects on demand and investment mainly in the internationally oriented sector of the economy. Under normal conditions a repo rate increase, or expectations of this, leads to a stronger exchange rate because the higher interest rates make Swedish assets more attractive than equivalent interest-bearing investments in other currencies; this draws foreign capital to Sweden, with an increased demand for Swedish kronor. All else equal, a relatively permanent weakening or strengthening of the exchange rate will affect demand via shifts in relative prices between Swedish and foreign goods. This in turn affects inflation. Inflation is also influenced directly by exchange rate movements in that these alter import prices.

stable confidence in the Swedish economy and the similar development of economic activity here and in the rest of Europe.

MONETARY POLICY MORE EXPANSIONARY

The deteriorating prospects for international growth and inflation in the autumn of 1998 had consequences for cyclical activity and inflationary pressure in Sweden. Financial market players increasingly expected a reduction of Swedish interest rates. These expectations were fulfilled when the monetary stance was adjusted in a more expansionary direction in December 1998 and February 1999.

Since the March Report, the expansionary shift in monetary policies in the rest of the world has continued, with a reduction of instrumental rates in a number of countries in Asia, Europe and Latin America. As inflation prospects were still subdued, the Riksbank chose to reduce the repo rate in connection with the publication of the March Report. The cut of 0.25 percentage points, to a rate of 2.90 per cent, was approximately in line with money market expectations. It brought the Swedish repo rate below the level of the ECB's instrumental rate. However, at the beginning of April the ECB reduced its rate by 0.5 percentage points to 2.50 per cent.

Since the March Report, the Swedish three-

month rate has declined about 0.3 percentage points and is currently approximately 2.90 per cent. A more expansionary monetary stance has contributed to increasingly low short-term rates; since November 1998 the Riksbank has lowered the repo rate in five steps that total 1.2 percentage points.

Current survey data and money market prices seem to mirror expectations of an unchanged repo rate in the near future.

The Riksbank's reduction of interest rates and the more expansionary monetary stance in Europe have probably contributed to expectations among external observers of a stronger economic trend in Sweden and somewhat less subdued inflation prospects. At present, survey data (Annex: Table 1) and money market pricing mainly seem to mirror expectations of an unchanged repo rate in the near future.

KRONA STABLE DESPITE DEPRECIATION AGAINST USD

In the March Report it was judged that the TCW exchange rate index would appreciate to 121 twelve months ahead and to approximately 118 in two years time. Since the Report was published, the TCW index has been more or less stable, which is a somewhat weaker tendency compared with the



Source: The Riksbank.

March assessment (Annex: Fig. 14). Since the turn of 1998, however, the TCW exchange rate has strengthened by a total of approximately 3 per cent.

The TCW exchange rate has been more or less stable since the publication of the March Report.

Against the euro the krona has appreciated to date this year by approximately 6 per cent (Annex: Fig. 40). This is no doubt partly explained by the calmer situation compared with the last autumn's financial market turbulence, when the krona weakened markedly, particularly against the German mark. In addition, the appreciation against the euro probably reflects the good economic fundamentals in Sweden, with good growth, low inflation and stable government finances. A further explanation for the appreciation at the beginning of this year could be increased expectations of Sweden's future participation in the ERM and EMU.

Most of the krona's appreciation against the euro occurred in January and February; the appreciation since the March Report has been marginal. The short-run fluctuations in the SEK/EUR rate have continued to diminish to levels that were observed before the turbulence last summer and autumn. Moreover, currency market pricing points to expectations that the volatility of the SEK/EUR rate will remain low.³

The krona and the euro have both weakened against the US dollar, which has been supported by the continued strength of the American economy.

The krona and the euro have both weakened against the US dollar, which has been supported by the continued strength of the American economy. As the dollar is a major contract currency, another factor behind its appreciation is probably the commodity price increases, above all for oil. To some extent, moreover, the dollar has no doubt benefited from its role as a safe haven for investors in connection with the unrest occasioned by the hostilities in Kosovo.

To sum up, the latest repo rate cut has meant that since the March Report the short-term market rates have fallen. Swedish long bond rates, like their euro counterparts, have to some extent followed the upward trend in the United States. The krona has weakened against the US dollar but the TCW index has been relatively stable.

Figure 6.

Real 3-month and 5-year interest rates and real effective (TCW) exchange rate. Per cent and index: 18 November 1992=100



Source: The Riksbank.

REAL SHORT-TERM INTEREST RATES The combined impact of interest rates and the exchange rate on total demand is judged to have become somewhat more expansionary than was assumed at the time of the March Report. From February to May this year the monthly level of the short real interest rate⁴ fell 0.3 percentage points to about 2.0 per cent (Fig. 6). This was mainly because the repo rate cut in connection with the March Report pushed the nominal short interest rates down.⁵

The movements in the long real interest rate have had a somewhat restrictive effectal. The increase since the March Report has brought the long real rate up to approximately 2.0 per cent,⁶ which is entirely due to higher nominal interest rates—since February the five-year inflation expectations have been broadly unchanged at 1.8 per cent.

The real TCW exchange rate has been comparatively weak in the past year; with the lower price trend in Sweden compared with the rest of the world, since the March Report the monthly level has gone on weakening. This makes the exchange rate effect somewhat more expansionary than before.

To sum up, in the present situation the combined effects of interest rates and the exchange rate are judged to be somewhat more expansionary than was assumed at the time of the March Report. The short real interest rate has fallen, partly as a result of the Riksbank's repo rate cut, accompanied by some increase in the long real interest rate. The real exchange rate has become somewhat weaker.

LOWER CORPORATE BORROWING COSTS Borrowing by households and most Swedish firms is mostly arranged with banks and other credit institutions. Investment financing directly in the money market is generally feasible only for very large companies. The spread between bank lending rates and the money market rates mirrors differences in credit risks, competitive conditions and the creditors' pricing strategies.

Last autumn there was a lag before the creditors' lending rates were adapted to the downward trend in money market rates. In 1999 Q1, however, the average bank rate for corporate loans fell as much as the money market rates, approximately half of a percentage point.⁷ For loans to households, however, there still seems to be some delay in that the spread in March 1999 was approximately 0.2 percentage points wider than in December 1998.

CREDIT SUPPLY STILL GOOD

Individual households and firms are not always considered to be sufficiently creditworthy because they are judged to be less prone to repay the loans. A similar circumstance is that, if interest rates rise and demand is accordingly subdued, the expected profitability of firms declines, which weakens their propensity and ability to carry debt. Firms that cannot or do not wish to obtain credit have to curtail operations and postpone investments, which dampens demand. As regards the credit mechanism, lending rates as well as volumes are therefore informative in the assessment of inflation prospects.

In April 1999 the 12-month change in total lending by credit institutions to the resident nonbank sector (households, firms and local authorities) was 6.5 per cent, which is above the most recent rate in the previous Report (Annex: Fig. 16). Lending to households was rising in April at a 12-month rate of 8.4 per cent, which is also some acceleration since the previous Report.⁸

Bank lending to the resident non-bank sector is still rising; in April the 12-month rate was 11.6 per

³ See box on p. 16.

⁴ The nominal three-month T-bill rate adjusted for the CPI change that households expect in the coming twelve months.

⁵ Figures from Statistics Sweden show that the price change expected by households in the coming twelve months was 0.9 per cent in April 1999 or 0.1 percentage point more than in February 1999.

^{6~} The average monthly level of the five-year T-bond rate adjusted for the rate of inflation five years ahead that financial investors expect according to Aragon's survey. The average for 1999 Q2 is based on the period up to 25 May.

⁷ *Financial Market Statistics 4, April 1999,* Sveriges Riksbank. The figures refer to the six-month T-bill rate.

⁸ Mortgage loans from housing institutions for owner-occupied and tenantowned dwellings, plus loans to the household sector from banks and other credit market companies.

cent. Corporate lending is growing fastest. This was accompanied by a marked acceleration of lending by housing intermediaries to households, which probably mirrors the situation in the housing market, with rising prices and a higher turnover for houses and tenant-owned dwellings.

All in all, the supply of credit still seems to be good in that the development of the credit aggregates shows an acceleration in the growth of lending to households as well as firms. This points to continued growth in retail trade and private consumption. The risk of an uncontrolled development of consumption financed with loans is judged to be slight in that households are mainly satisfying an accumulated demand for durable goods at a time when they are probably in a good position to pay.

Growth of the credit and money supply aggregates points to rising inflationary pressure in the future.

The growth of the credit and money supply aggregates is still comparatively high and points to rising inflationary pressure in the future. The narrow money supply (M0, defined as the resident non-bank sector's holdings of notes and coins) has been a good indicator of inflation about six quarters ahead. In April the 12-month rate of M0 growth was 7.6 per cent, which is somewhat lower than in March but considerably higher than in January and February (Annex: Fig. 18). The continued high rate suggests that the development of private consumption will remain strong.

The broad money supply (M3, which also includes the non-bank sector's bank deposits and certificates of deposit) is sometimes markedly affected by portfolio rearrangements between bank deposits and alternative assets that are not included in this aggregate. Even so, M3 is considered to be a useful indicator of inflation. In April the growth rate was 6.8 per cent, which is higher than the latest figure in the previous Report (Annex: Fig. 18). A large part of the upswing is judged to come from increased corporate deposits.

Both the credit and the money supply aggregates point to a continuation of the strong tendencies for retail trade and private consumption, as well as rising inflationary pressure in the future.

IMPLIED EXCHANGE RATE PROBABILITY DISTRIBUTIONS

In the period since the March Report the Swedish krona has been stable against the euro and global financial and currency markets have been comparatively calm. It may be of interest to study whether and, if so, in what way market assessments of uncertainty about the krona's exchange rate have changed recently, as well as current perceptions of the exchange rate's future path. In the March Report it was noted that a picture of market perceptions of the uncertainty about this path can be formed from currency option prices. This approach has now been developed, using option prices to derive *implied probability distributions for the exchange rate*. Distributions of this type can be interpreted as the market's *ex ante* assessment of the probability distribution for the future exchange rate.⁹

In that the price of an option can generally be writ-

ten as a function of the probability distribution of the underlying asset, implied probability distributions can be estimated from observed market prices for options.¹⁰ The implied exchange rate distribution accordingly conveys information of the same type as the OTC market prices for currency options (at-the-money volatility, strangle and risk reversal). The advantage of implied distributions is that they yield various quantitative indicators of the market's risk assessment and these can be interpreted in terms of probabilities, which is often more instructive than the information conveyed by quoted option prices.

The estimated distributions for SEK/EUR derived from one-month option prices on 20 October 1998, 29 January and 25 May 1999 are shown in Fig. B2.¹¹ For 20 October 1998 the estimated implied distribution is dis-

Figure B2.

Implied SEK/EUR probability distributions one month ahead on 20 October 1998, 29 January 1999 and 25 May 1999. One month forecast horizon. Yield in SEK/EUR*



* Return in relation to the forward rate, that is, the mean of the distribution. Sources: Reuters and the Riksbank.

persed (a high standard deviation). At that time the financial markets were turbulent in connection with Russia's debt moratorium and the Swedish krona weakened. This naturally generated considerable uncertainty about the future exchange rate. When the financial unrest subsided after the turn of the year, uncertainty about the krona's future path decreased at the same time as the krona began to recover against the euro. This appreciation, which continued throughout January, may also have been supported by increased expectations that Sweden would be joining the euro area.

That uncertainty about the future exchange rate decreased early in 1999 is clear from the standard deviation of the implied distribution on 29 January 1999, which is considerably lower than on 20 October 1998. While the uncertainty had decreased in January, it will be seen from Fig. B2 that the distribution is positively skewed (the right-hand side of the distribution is longer and has a fatter tail). This in turn can be interpreted as indicating that a marked weakening of the krona one month ahead was considered more probable than a corresponding appreciation. Since the beginning of February the krona has been relatively stable, and exhibited a low volatility. The probability distribution for 25 May 1999 shows that the market considered that the uncertainty had continued to decrease since January. The distribution is even more compressed than it was on 29 January, though it is still positively skewed.

The implied distributions in Fig. B2 are snapshots of market expectations on those particular dates. It can also be of interest to study how the market's assessment of uncertainty has varied over a longer period. One approach involves studying the path of a confidence interval.¹² The interval is chosen so that it includes a fixed proportion of the probability distribution's mass, say 90 per cent. In other words, it can be interpreted as the interval within which the market believes that the exchange rate will end up in at the end of the forecast horizon with a 90 per cent probability. The interval accordingly provides an indication of the degree of uncertainty in the currency market over time. A broad interval signifies high market uncertainty about the future exchange rate.

The 90 per cent confidence interval for SEK/ DEM¹³ one month ahead is presented in Fig. B3 for the period from 1 August 1993 to 25 May 1999. It clearly demonstrates that uncertainty about the future exchange rate has varied over time. Option prices show that uncertainty about the future increases during periods of financial and currency market turbulence. This pattern was particularly clear in connection with the Mexican crisis around the turn of 1994 and the Russian crisis in the early autumn of 1998. Besides the increased uncertainty about the krona's future rate, there is a tendency for the krona to weaken against the German mark in turbulent periods. As last autumn's financial market unrest subsided, the krona did strengthen against the euro (and thereby against the German mark) and the market perceived a diminishing degree of uncertainty. This means that market players no longer perceive the same probability as before of large short-run fluctuations in the value of the krona

The implied SEK/EUR distribution does indicate, however, that a marked depreciation of the krona in the coming month is considered to be somewhat more probable at present than a marked appreciation. 9 Note, however, that what is estimated is just the *risk-neutral* distribution, that is, just the distribution that would obtain if the market players had a neutral attitude to risk.

10 More specifically, we have estimated implied distributions for the future exchange rate with the method described in Malz, A.M. (1997), Option-implied probability distributions and currency excess returns, *Federal Reserve Bank of New York Staff Report* no. 32; the method is also described and the interpretation of the results is discussed in Aguillar, J. & Hördahl, P. (1999), Option Prices and market expectations, *Quarterly Review 1*, Sveriges Riksbank.

11 For the period up to the end of 1998, options data for SEK/DEM were used and the results were transformed into SEK/EUR with the DEM/EUR conversion rate (1.95583).

 $12\;$ Note that as the implied distributions are risk-neutral, the mean value invariably equals the forward rate.

 $13\;$ We used the SEK/DEM rate because in this case we are studying a time series that goes further into the past.



Chapter 2

Determinants of inflation

This chapter presents the assessment of the main factors that will be determining inflation in the coming twenty-four months. International factors are considered first, followed by a survey of demand relative to supply in the Swedish economy. The discussion then focuses on effects of deregulations, the extent to which the consumer price index is affected by political decisions, changes in interest expenditure and also inflation expectations.

International activity and inflation

In many respects the international economic situation is now more robust than at the time of the March Report. The strength of the US economy has been reconfirmed and the interest rate cut by the European Central Bank (ECB) at the beginning of April has countered the slowdown in the euro area. The succession of crises in emerging markets also

FACTORS BEHIND THE PATH OF INFLATION

Because of the time lag before monetary measures affect economic activity and inflation, policy has to be guided by an inflation *forecast*. The present forecast, like those in earlier Inflation Reports, starts from an unchanged repo rate. This is a technical assumption and its primary purpose is educational—to clarify whether a repo rate adjustment is called for and, if so, in which direction. Thus, an inflation assessment which results in the conclusion that, at the time horizon of twelve to twenty-four months which is the Riksbank's primary concern, inflation will be above (below) the target rate, normally implies that there is reason to raise (lower) the repo rate. With a time horizon of twelve to twenty-four months, the factors that, in addition to monetary policy, essentially determine the development of inflation are as follows.

1) International activity and inflation

In that Sweden's economy is highly dependent on foreign trade, external economic developments are an important consideration in the assessment of inflation.

Economic activity in the rest of the world affects demand for Swedish exports and is therefore an important component in the assessment of total demand. *External inflation* affects the price of imported goods in foreign currency, while *exchange rate movements* condition the extent to which changes in world market prices pass through to *import prices* in Swedish kronor. An appreciation of the krona tends to reduce the impact on domestic inflation from a given external price rise. The effect on domestic inflation is also conditioned by the development of profit margins on imports. Moreover, changes in world market prices that are not countered by exchange rate movements affect the competitive position for Swedish exports and this can have repercussions on the rate of wage increases and other production costs in Sweden.

2) Demand relative to supply

Demand that exceeds long-term production capacity normally generates inflationary pressure. Monetary policy therefore has to be gauged so that demand is kept as close as possible to the development of production capacity. A variety of indicators can be used to obtain an overall picture of the inflationary pressure that is emanating from demand in relation to supply. One of these indicators is the National Institute's business tendency data on industrial capacity utilisation. Another is the labour market situation, where, for example, comparatively high wage increases despite high unemployment may indicate a limited possibility of enlarging total demand without incurring wage inflation. A third type of indictor is the *output gap*—an econometric estimate of the difference between GDP's registered and potential long-term levels.

The higher the level of production relative to potential output, the greater the probability of capacity shortages arising in parts of the economy. The occurrence of bottlenecks can therefore be a sign that output is approaching its potential long-term level. A shortage of a particular category of labour may be such a sign. A complication here, however, is that high demand and high wage increases for a certain category of labour can also result from better productivity and profitability compared with other activities. In that case, such wage increases are not a direct inflationary threat, though they do call for efficient wage formation and labour market flexibility. Assessments must also allow for the fact that, in time, high investment, an increased labour supply or improved technology lead to increased production capacity.

Changes in demand do not, however, exert an influence on all prices through market mechanisms. Some prices are set by administrative decisions, based above all on the cost side or with a sizeable element of subsidy. Examples of fully or partly administered prices in Sweden are housing rents and charges for medical care and certain municipal services. One consequence for monetary policy is that for certain prices, the impact of interest rate adjustments is subject to particularly long lags. Monetary policy can influence these prices only through effects on the general development of costs, e.g. wages. $^{\scriptscriptstyle 14}$

3) Other cost shocks, effects of political decisions and interest expenditure

Inflationary impulses can also be generated by cost increases that are specific instead of stemming from a general increase in world market prices or strong domestic demand. A price movement for primary products as a consequence of supply-side shocks is one example. Similar impulses can come in the form of changes in indirect taxes and subsidies, or from deregulations. Such inflationary impulses are normally transitory in the sense that they entail an immediate change in the general price level. They may still have a lasting impact on the inflation process. In that case inflation expectations will be affected. In order to gauge trend inflation (inflation excluding transitory impulses), the Riksbank uses various indicators of underlying inflation.

4) Inflation expectations

High demand prompts producers to raise prices and employees to bargain for higher wages. But inflationary price and wage increases can also stem from high inflation expectations as such, because economic agents strive to maintain or increase their real income level. In this way, if confidence in monetary policy is lacking, inflation expectations are liable to be self-fulfilling.

When assessing the significance of inflation expectations for monetary policy, it must be born in mind that the expectations often relate to the prospect of a particular policy. The fact that inflation expectations are in line with the target does not therefore necessarily show that the monetary stance is well balanced—the expectations themselves may rest on a presumption that the instrumental rate is going to be adjusted.

The factors outlined above are those, which, according to accepted economy theory as well as practical experience, affect inflation. An analysis of these factors is accordingly an important component of the foundation for monetary policy decisions.

14 For an account of administered prices in the CPI, see *Inflation Report 1997:3*, p. 8.

seems to be coming to an end after the effects of the collapse of the Brazilian currency turned out to be unexpectedly small. The first economies to be hit by the Asian crisis are gradually beginning to recover. The global financial unrest has subsided and risk premia have accordingly decreased.

Compared with the March Report, GDP growth in the OECD area has been revised upwards, to 2.0 per cent for 1999 in view of the strong growth in the United States and to 2.0 per cent for 2000 on account of a recovery in the euro area. Growth is expected to continue in 2001 at a rate of 2.1 per cent.

STRONGER EXPORT MARKETS During the spring, tendencies in Sweden's main export markets have become somewhat stronger.

Activity in Europe at a low, but turning point.

In Sweden's largest export market, the euro area, industrial activity was very weak at the beginning of the year, above all in Germany and Italy, in the wake of the Asian crisis. A number of confidence indicators now suggest, however, that this downward tendency is coming to an end. One important factor behind the greater optimism is the ECB's interest rate cut of 0.5 percentage points in April. As a recovery in manufacturing is still being hampered by weak global demand, it is rather the persistent strength of domestic private consumption that heralds a recovery in 2000 and 2001, when demand in the euro area is expected to lift manufacturing as well as the services sector. The optimism among households is underpinned by rising disposable incomes and gradually falling unemployment.

In Sweden's important European export markets outside the euro area—Denmark, Norway and the United Kingdom—activity is weakening during 1999. However, the slowdown in the Danish and British economies looks like being less marked than had been feared, mainly thanks to reduced instrumental rates. The budgetary tightening in Denmark does not seem to have moderated domestic demand as heavily as expected. The slowdown in the United Kingdom looks like being moderate and brief; lower inflationary pressure has been followed by interest rate reductions that already seem to have strengthened British business and consumer confidence. Activity on Norway has remained weak but may benefit from the rising oil prices this spring.

Continued strength in the United States.



Source: Ecowin.

The US economy continues to exceed expectations. Preliminary figures show an annual GDP growth rate in 1999 Q1 of 4 per cent. Employment is still rising but strong productivity growth means that wage costs have actually become more subdued. Notwithstanding the high productivity growth, however, there has been some increase in inflationary pressure, mainly in connection with rising oil prices. Consumer confidence, buoyed by record equity prices, is now in the vicinity of the high levels from before the Russian crisis. The previously weak manufacturing activity also shows signs of picking up. Still, there is much which suggests that activity in the United States will slacken during 2000 and 2001, particularly if the rapid increase in share prices in recent years does not continue. The growth of private consumption is then expected to be subdued and more in line with the development of household income. At the same time, rising long term interest rates due to somewhat higher inflation expectations, as well as a weaker profit trend, are expected to check investment.

Turning-point in emerging markets.

Now that the Brazilian real and inflation rate have stabilised, the slowdown in 1999 in Brazil and Latin America on account of the real's collapse looks like being less extensive than expected. The Latin American market is relatively small for Swedish exports but the favourable picture in Brazil has subdued the global financial unrest and tended to reduce risk premia for credits to the emerging markets. It also looks as though, two years after the Asian crisis erupted, the economies in Southeast Asia have reached a turning-point. Industrial production and GDP are no longer falling markedly in any country in this region, while in a number of countries domestic consumption and share prices are rising again. The forecast for 1999 now points to a recovery led by South Korea. An upswing in the entire region is foreseen at the beginning of 2000, albeit with some reservations, connected for instance with growing budget deficits. In Sweden's rapidly growing export markets in Central and Eastern Europe, activity seems to be making an appreciable recovery this year now that the effects of the Russian crisis have proved to be relatively short-lived.

Even with the upswing in the rest of Asia, activity in Japan will remain very weak. With a continued price fall and households' disinclination to increase their consumption, GDP is still declining this year. Still, with a notably expansionary fiscal policy and a base rate close to zero, during the spring there have been some signs that business and con-

Figure 8. Consumer confidence and share prices in the United States. Indexes



Source: Ecowin

sumer confidence had reached a low. But GDP is not expected to stabilise before 2000 because high surplus production capacity has led to dramatic cutbacks and steeply rising unemployment.

All in all, the picture of international activity looks more favourable for growth prospects for Swedish exports than at the time of the March Report. The trend will remain weak during 1999, while a clearer improvement is expected in 2000 and 2001.

INFLATION LOW DESPITE STRONGER GROWTH

Although the economic situation has brightened in most export markets and oil prices have risen this spring, no dramatic upward pressure is foreseen on inflation in the OECD area. The surplus capacity for export production in the major OECD countries, together with persistently weak demand for commodities, should continue to hold back producer price increases in the coming years. In the United States, however, the producer price tendency seems to be pointing somewhat more strongly upwards, whereas the trend in the euro area is still downwards. With the oil price increases in recent months, export prices for manufactured products in national currencies are expected to rise in the OECD area. But even with a rapid pass-through, the effects of the higher oil prices on consumer prices in the OECD area are expected to be very slight.

The combination of increased oil prices and somewhat stronger international activity prompts some upward revision of the 1999 forecast for OECD export prices in national currencies. The export price fall is now expected to be less marked than foreseen in the March Report, only –0.6 per cent. In 2000, OECD area export prices are expected to rise again by 1.3 per cent; the upward trend is less strong than expected earlier because a somewhat lower trade-off is now envisaged between growth and inflation. The Riksbank's assessment of the trade-off is thereby in line with those by the OECD and the IMF, for example. In 2001 the rising trend continues at a rate of 1.5 per cent.

The CPI for the OECD area is expected to rise 1.4 per cent in 1999, followed by some acceleration to 1.6 per cent in 2000 and 1.9 per cent in 2001 on account of the recovery in Europe and Asia.

Figure 9. Producer and consumer prices in the OECD area and the euro area. Percentage 12-month change





A NEW ECONOMIC ERA IN THE UNITED STATES? SOME REFLECTIONS

Economic growth in the United States in recent years has surpassed most forecasts at the same time as unemployment has fallen to levels that have not been seen since the 1960s. Instead of the rising inflation associated with earlier upswings, however, inflation has gone on falling. Observers have therefore begun to talk of a new economic era.

What has happened? Different notions

At a general level there are two notions of what has happened. One attributes the recent trend to a number of transitory factors, the other considers that the US economy has undergone such major changes that earlier relationships have been modified or even ceased to apply.15

The hypothesis of a 'new economy' assumes that structural changes have permanently raised potential output and lowered equilibrium unemployment (the rate at which inflation is stable). It argues that more efficient modes of production, facilitated by the IT revolution, for example, have contributed to a marked increase in labour productivity, thereby countering price pressure from labour and enabling permanently low inflation despite strong labour demand. The increased IT input has also made labour more flexible and mobile across

industries and sectors. Moreover, access to rapid information has facilitated the search process in the labour market. At the same time, changes in welfare systems since the mid 1990s (for example tax incentives to make low-paid jobs more attractive and stricter systems for grants) have strengthened the work incentive. A further factor is said to be that increased internationalisation has substantially increased competition in product markets and increased the need for corporate cost controls. All these factors, which to some extent existed earlier, have combined to bring about a new paradigm, with a drastic reduction of natural unemployment.¹⁶ A more extreme variant of this school of thought is that natural unemployment, if it ever existed, has ceased to apply. Others consider that the US economy will continue to grow, that earlier restrictions whereby overheating arose are no longer binding and the business cycle is dead.

The other hypothesis is that 'a series of favourable supply shocks' has temporarily kept inflation down in a situation in which the rate of price increases would otherwise have accelerated and obliged the Federal Reserve to tighten monetary policy. Examples of such factors are lower food and energy prices (mainly oil) and low import prices on account of a strong dollar and weak international demand. Rapidly falling prices for high-

Figure B4.

GDP, unemployment and CPI in the United States. Percentage 12-month change and per cent





tech products, computers in particular, and a low cost trend for medical and health care services as a result of amended regulations are also commonly cited factors behind the persistently low inflation. A common feature of these factors is that they are perceived as transitory. The very low oil price and the strong dollar, for example, can be attributed, at least in part, to weak global growth in the wake of the Asian crisis. As global activity picks up, it is argued, the effects of the Asian crisis will fade.¹⁷

Productivity growth has improved, but by how much?

A look at productivity per man-hour in the corporate sector (excluding agriculture), which is usually considered to be the best indicator of long-term economic development, shows that nothing sensational has happened in the current upward phase. In the period 1992-98 annual productivity growth averaged a modest 1.3 per cent as against 2.8 per cent in the 'golden era' 1947-73. In a shorter perspective, 1996 to the beginning of 1999, however, productivity growth is more impressive, around 2 per cent.¹⁸ This should be seen, moreover, in relation to the advanced cyclical phase in the US economy, when productivity has tended to decline historically. All in all, there are many indications of some increase in potential growth.

Looking back, it can be seen that in the past five or six years the US economy has benefited from a number of transitory factors with downward price effects, not least the low import prices connected with the Asian crisis. This has helped to keep inflation down at the same time as falling long bond rates have contributed to a strong upswing for consumption and investment as well as rapidly rising stock markets, thereby generating a good circle.

It seems probable that potential growth has tended to rise in the 1990s. It seems unlikely, on the other hand, that economic activity has ceased to follow a cyclical pattern. Even if structural unemployment has decreased, sooner or later the point is reached where unemployment cannot go on falling without inflationary pressure picking up. There is much evidence that the US economy is now in the vicinity of that point. The big question is whether there will be a gradual slowdown, without rising inflationary pressure, or a more abrupt change, a classic case of overheating.

18 Some observers consider, however, that a lack of reliable statistics results in an underestimation of services productivity.

¹⁵ The 'new economy' concept is discussed more fully in, for example, Gordon, R.J. (1998), Foundations of the Goldilocks economy: supply shocks and the time-varying NAIRU, *Brookings Paper on Economic Activity*.

¹⁶ International prices, search costs, tax wedges and the generosity of social security systems have long bee cited as some of the main determinants of NAIRU; see, for example, Layard, R., S, Nickell & R. Jackman (1991), *Unemployment: Macroeconomic Performance and the Labour Market. Oxford University Press.*

¹⁷ See, for example, Brinner, R.E. (1999), Is inflation dead?, *New England Economic Review*.

Interest rates and exchange rate

The development of interest rates and the exchange rate is an important factor for future price tendencies. To some extent, the Riksbank's assessment of future movements in these rates is conditioned in turn by the circumstance that the inflation forecast for the coming twenty-four months is based on the technical assumption of an unchanged repo rate. For market interest rates, the impact of the repo rate is crucially dependent on maturities—for the shortest bills the effect is considerably greater than for long bond rates. The three-month rate is therefore presumed to be virtually stationary during the forecast period. However, the reduction of the repo rate by 0.25 percentage points, to 2.90 per cent, in connection with the March Report does entail a corresponding downward revision of the forecast threemonth rate. For the same reason, some downward revision is called for in the forecast for the long bond rate. By the end of the forecast period, moreover, it is assumed that Swedish long bond rates will have risen, from the current low levels, by over half of a percentage point.

A gradual appreciation of the krona in the forecast period was envisaged in the March Report. A long-term appreciation is still expected, in accordance with the Riksbank's earlier equilibrium estimates.¹⁹ In the forecast period, however, the path of the krona is judged to be somewhat weaker than envisaged in March. The reasons for this are that the krona has appreciated more slowly than expected this spring and Swedish short-term interest rates have fallen relative to the rest of the world. The TCW index is judged to be just above 120 twelve months ahead and about 118 after twenty-four months. 20

In the United Kingdom the instrumental rates were recently adjusted downwards. This is judged to contribute to a weakening of sterling relative to the Swedish krona. The US dollar is assumed to remain strong in the short run, partly because a tightening of the monetary stance appears more probable than the opposite; somewhat further ahead, however, a weakening of the dollar is foreseen as US economic activity slackens relative to the trend in Europe.

The long-term undervaluation of the krona relative to the euro is judged to be less marked than in terms of a TCW index.

The krona is also judged to appreciate against the euro. In that the cyclical positions of Sweden and the euro area are largely the same, the long-term undervaluation of the krona relative to the euro is judged to be less marked than in terms of a TCW index. In other words, there is more room for an appreciation of the TCW index in that sterling and the US dollar are judged to weaken in time as activity in the United Kingdom and the United States slackens.²¹

To sum up, short-term interest rates are assumed to be more or less stationary in the forecast period, given the underlying assumption of an unchanged repo rate. Longer Swedish bond rates are assumed to be just over half of a percentage point higher in twenty-four months time. As before, the Swedish krona is judged to appreciate.

19 See Inflation Report 1998:3, box on pp. 27-29.

20 This assessment is largely in line with the expectations of financial market investors (Annex: Table 1).21 See box on pp. 27-28.

THE SEK/EUR EXCHANGE RATE

The euro is the dominant foreign currency for Sweden's economy. Its weight in the TCW index is around 56 per cent. The euro area receives about 40 per cent of Swedish exports of goods and supplies about 50 per cent of imports. Sweden's membership of the European Union underscores the links with the euro area. Were Sweden to join the euro area, the Swedish krona would be replaced by the euro. The Swedish Riksdag has stated that participation in ERM2 can be seen as a preparation for Sweden's membership of the euro area. The Government decides the exchange rate system for the krona but in the event of Sweden adhering to ERM2, the Riksbank would have a responsibility for the rate at which the krona is tied to the euro. The central rate. however, is ultimately a matter for negotiation and would be decided together with the Government in discussions with the other EU member states.

Historical picture

In that the euro has functioned as a currency only since the monetary union was established at the beginning of 1999, its relationship with the krona is equally brief. A longer period can be illustrated, however, by relating the krona to the currencies that have been converted into euro. This 'euro component' of the TCW index is shown in Fig. B6 together with the non-euro currencies and the total index. Except in the second half of 1998, since 1996 the krona has been more stable against the currencies that have been converted into euro than against the noneuro currencies in the TCW index. Early in 1999 the krona appreciated very rapidly and strongly both against the euro and in terms of the TCW index. Since February, however, the krona has been fairly stable against the euro and tended to weaken against the non-euro currencies.

One explanation for the krona's tendency to be more stable against the euro compared with other currencies is that Sweden's cyclical position in recent years has been roughly in phase with the euro area, while activity in countries such as the United Kingdom and the United States has been stronger (Fig. B7). As a result, the monetary stance in Sweden in this period has not differed much from the euro area, while countries such as the United Kingdom and the United States have had a more restrictive stance. This tended to strengthen the currencies of the latter countries relative to the euro as well as the krona.

Future path

The Inflation Report's main scenario assumes that in the coming years the krona will appreciate in terms of the TCW index by approximately 7 per cent. This raises the question of the krona's future path against the

Figure B6.

The Swedish krona's nominal effective exchange rate with euro-area and other currencies in the TCW index. Index: 18 November 1992=100



Figure B7.

Cyclical position in terms of OECD indicator of the output gap in the United States, the United Kingdom, Sweden and Euro-11. Per cent of potential GDP



Note. For 1999 and 2000 the output gaps are based on forecasts. Source: OECD.

euro. To throw light on the issue one needs to consider the degree of internal and external imbalances in Sweden and the euro area. Internal balance in this context is defined as full capacity utilisation and price stability, external balance as a stable GDP share for external debt.

The real exchange rate is considered to be in *long-term equilibrium* when the economy is in both internal and external balance. In a state of internal balance with

current-account surpluses or deficits that are moving external debt towards its long-term level, the exchange rate is said to be in *medium-term equilibrium*. If external debt relative to GDP is above its long-term level, for instance, a period with current-account surpluses and an exchange rate below its long-term level is needed to complete the adjustment of debt, given that the economy is in internal equilibrium. The *short-run equilibrium exchange rate* is determined by the country's cyclical



position and monetary stance relative to the rest of the world. Short-run equilibrium implies that monetary policy is consistent with achieving internal balance within a certain period at the same time as the current-account trend is consistent with achieving external balance in the long run.²²

Sweden's weak cyclical position compared with the United States and the United Kingdom, with the relatively more expansionary monetary stance this entails, indicates that the krona's TCW exchange rate can be expected to strengthen in the future. In time, the krona will probably appreciate against the US dollar and sterling as the Swedish economy moves towards full capacity utilisation and activity in the US and British economies slackens. On the other hand, the cyclical positions of Sweden and the euro area do not differ appreciably. There are no indications that the monetary stance in Sweden is, or is expected to become, more expansionary than in the euro area. This assessment is essentially confirmed by the expectations of future monetary policy that can be derived from Swedish and German forward interest rates (Annex: Fig. 12).²³ All in all, this suggests that the krona will not strengthen as much against the euro as in terms of the TCW index.

What, then, are the arguments in favour of an appreciation of the krona against the euro? Traditional indicators of competitiveness suggest that the krona is comparatively weak at present, at least in a historical perspective (Fig. B8). This by itself should affect the krona's exchange rate. One ground for a comparatively low exchange rate with the euro in the present situation and an appreciation further ahead is that, relative to the euro area, Sweden's external debt is higher, so a longterm undervaluation of the krona against the euro is needed in the coming years to support a trend towards external balance.

Sweden's net external debt is considerably higher than that of many euro countries, including Germany, France and Italy (Fig. B9).²⁴ Although the level of Sweden's external debt is exaggerated in Fig. B9 on account of measurement problems, there are reasons for reducing it.²⁵ The trend towards an increased proportion of pensioners some time after the turn of the century, for instance, calls for increased saving and thereby decreased external debt. As the external debt-to-GDP ratio declines towards its long-term equilibrium level, there is less need for current-account surpluses and the krona appreciates.

To sum up, the krona is judged to strengthen against the euro in the coming years but the appreciation can be expected to be less than in TCW terms.²⁶ This is because decreased cyclical differences point to a diminishing short-term interest rate differential with the United States and the United Kingdom, accompanied



by the prospect of this differential with the euro area being rather small in the future. The similarity of inflation prospects in Sweden and the euro area should imply continued stability in the krona's rate against the euro. In time, however, the krona will probably appreciate against the euro as Sweden's external debt approaches the levels in the euro area. This view is also supported to some extent by market expectations of the future exchange rate as reported in survey data. The May survey by Statistics Sweden indicates that, on average, money market players expect the krona to strengthen in the coming twenty-four months to a rate of 8.70 against the euro. 22 The concepts of long-term, medium-term and short-run equilibrium are discussed more fully in *Inflation Report 1998:3*, box on pp. 27-29.

23 The forward interest rate differential does not exclusively represent differences in monetary policy expectations because it includes a Swedish risk premium, estimated earlier to about 0.3 percentage points.

24 No data are available on the external position of the euro area.

25 Preliminary calculations indicate that in 1998 Sweden's external debt was equivalent to about 20 per cent of GDP; see Blomberg, G. & Östberg, J. (1999, forthcoming), Market-valued external position—a new picture of Sweden's dependence on the rest of the world, *Quarterly Review 2*, Sveriges Riksbank.
26 This assessment is fairly close to the exchange rate expectations of financial market investors (Annex: Table 1).

Import prices

Import prices affect inflation both directly and indirectly. Changes in international export prices and in the krona's exchange rate have a *direct* impact on consumer prices because a sizeable part of the CPI consists of imported goods and substitutes for imports. Moreover, movements in international prices and the exchange rate affect inflation *indirectly* via effects on the relationship between domestic demand and supply. It is the direct effect that is discussed here.

The link between international price movements for commodities and manufactured products on the one hand and Swedish producer and consumer prices on the other is complex. The exchange rate is highly important for the prices to producers but the pass-through, particularly for manufactured goods, is liable to be both lagged and incomplete. This is even more the case for the pass-through to consumer prices, which can take several years.²⁷ The pass-through for commodity prices is more immediate, which has to do with these items being homogeneous and priced in the world market.

Commodity prices are assumed to rise.

Since the March Report the development of international prices for manufactured exports has been adjusted upwards for 1999, partly in view of the stronger outturn to date and rising commodity prices. Some downward revision has been made, however, to the export price forecast for 2000, because the trade-off between growth and inflation is judged to be marginally lower than assumed earlier. The Riksbank's assessment is therefore in line with those of the OECD and the IMF, for example. The krona has strengthened more slowly this spring than expected but, as in the March Report, an appreciation is assumed in the forecast period. It is also assumed that the commodity price rise in recent months will be followed by some further increase. The forecast for international oil prices twenty-four months ahead has been revised upwards from US\$15 to US\$16.5 a barrel. Some further increase is likewise foreseen for other commodity prices (see the box on pp. 30-32).

The international price rise for manufactured exports in the coming twelve to twenty-four months is judged to somewhat slower than assumed in March.

The somewhat stronger international price trend in 1999 that follows from rising commodity prices, together with the assumption of a weaker exchange rate tendency, leads to an upward revision of the consumption-weighted development of prices to producers for manufactured imports. For 2000 and 2001, however, some downward revision has been made on account of a weaker international price trend and the effect on consumer price inflation is judged to be small (Fig. 7).

For imported goods including petroleum products, consumer prices are judged to rise by 2 per cent in 1999, which is almost 1 percentage point more than assumed in the March Report. The revision is partly a consequence of decreased subsidies for medicines (which are classified as being mainly imported). In the remainder of the forecast period the annual import price change is expected to be the same as foreseen in March, around 1 per cent. The aggregate annual contribution to the CPI from import prices is judged to be about 0.5 percentage points in 1999 and about 0.2 percentage points in both 2000 and 2001.

International export prices are judged to fall less markedly in 1999 than was assumed earlier. In the period twelve to twenty-four months ahead, however, external price pressure is likely to be somewhat weaker than envisaged in the March Report. The total contribution to the CPI from import prices is judged to be about 0.5 percentage points in 1999 and about 0.2 percentage points in both 2000 and 2001.

27 See Inflation Report 1998:4, box on pp. 27-28.

Figure 10.

Price indexes for goods that are mainly imported excluding changed taxes on consumer goods and consumption weighted import prices to producers. 1999-2001 forecast.

Percentage 12-month change



Note: Crude oil and petroleum products excluded from both series. Sources: National Institute of Economic Research, Statistics Sweden and the Riksbank.

COMMODITY PRICES AND INFLATION

Direct and indirect effects on CPI

Commodity prices have a low weight but, being highly volatile, their effect on other prices can be considerable. Commodity price movements affect the CPI directly and indirectly. In that commodities are homogeneous products and priced in world markets, the direct passthrough tends to be immediate and fairly complete. The indirect effect is more dispersed over time and less predictable. Oil price changes affect the CPI directly in the form of prices for petrol and domestic heating oil, and indirectly via more refined energy-related products and intermediate goods. The effects of price movements for other commodities are predominantly indirect, via intermediate goods, and also more elusive.

From Fig. B10 it will be seen that for crude oil, the paths of producer and consumer prices are not entirely parallel. This is largely because these prices include additional processing. For the same reason, neither is the pass-through from commodity to producer prices complete in the case of other commodities, such as metals. Another factor behind the incomplete pass-through in producer and consumer prices is exchange rate changes. For example, the commodity price fall, calculated in USD, during 1998 was countered by the weaker development of the krona. In addition, the consumer price is dependent on profit margins, wages, taxes and other expenditures for transportation and retailing. $^{\rm 28}$

Econometric estimations suggest that at present, a 10 per cent increase in the price of crude oil has a direct CPI effect of approximately slightly less than 0.1 percentage point. In time, this is accompanied by roughly as large an indirect effect.

Consumer prices less sensitive to commodity prices

The part played by petroleum-related products and other commodities in Sweden's economy has decreased. The total weight for petroleum products in consumer prices (excluding indirect taxes) has decreased from about 4 per cent in the 1980s to about 2 per cent in the '90s. Crude oil imports have also risen more slowly than other imports. Other commodities have also declined as a share of total imports.

Price dynamics—commodity cycles relative to the global business cycle

Prices of certain commodities, copper for example, tend to follow the business cycle to some extent. This is less the case for other commodities, such as crude oil, for

Figure B10.

Prices of crude oil and petroleum products. Percentage 12-month change. 1999-2001 forecast



which the price is also dependent on other factors, such as climatic conditions, OPEC decisions and global conflicts. There are signs that certain other commodity prices can function as leading indicators, above all aluminium with a lag of four to six quarters.

In the period 1980-96, non-energy-related commodities can be said to have followed a cyclical path between consecutive price peaks (in 1980, 1988 and 1996).²⁹ In between, prices have fallen 25-30 per cent initially (on average during the first 34 months), partly in connection with weak global growth, and then levelled out or turned upwards again.

Present price tendencies and the Riksbank's forecast

In the course of 1998, prices fell more than 30 per cent for crude oil and around 20 per cent for basic metals, partly in connection with the drop in demand on account of the Asian crisis. These decreased prices made an appreciable contribution to the weak price tendency in Sweden. The direct effect of the oil price in 1998 was about -0.4 percentage points and the indirect effect is estimated to have been almost as large. To date in 1999 the direct CPI effect of the oil price rise is in the region of about 0.2 percentage points. Since the beginning of 1999, the world market price of coffee has fallen about 15 per cent while the consumer price for coffee has decreased 1.7 per cent, which has a marginal downward effect on the total CPI. The pass-through from falling coffee prices is probably lagged about one quarter. Recently there has been some recovery in other commodity prices but it is considered that this has not yet had an appreciable effect on the producer price index for intermediate goods.

Global growth in 1999 is judged to be relatively weak, 2.0 per cent, which suggests a limited commodity price rise this year. Increased demand is foreseen in the longer term, however, and should lead to rising prices. On the supply side, new technology will probably result in a considerable reduction in extraction costs.

In the somewhat longer run, the prospect of growing demand is judged to imply a further increase in commodity prices. The price forecast for crude oil (the most important commodity for imports) has been revised upwards from US\$15 to US\$16.5 a barrel in twenty-four months time. In real terms, however, this is a weak tendency (Fig. B11). Other commodity prices are likewise expected to rise gradually in the forecast period.

28 Ibid.

29 Global Commodity Markets—a comprehensive review and price forecast, World Bank, April 1999.

Figure B11.

Crude oil price at constant (1990) and current prices. USD per barrel. 1999–2001 forecast



Demand and supply

The analysis in this section follows the earlier national accounts system (SNA 68).

FOREIGN TRADE

The trend for imports as well as exports in 1998 was somewhat stronger than had been expected, though export growth slackened towards the end of the year and the volume of imports fell. The foreign trade statistics for 1999 Q1 suggest that this tendency continued.

The picture of exports conveyed by different indicators is still mixed. The export order inflow has begun to rise from the low at the end of 1998 but the 12-month change is still negative. The purchasing managers index suggests that the orders situation continued to improve in March and April. At the same time, the Q1 business tendency survey from the National Institute of Economic Research points to the export order inflow being weaker than firms had expected earlier, though firms are clearly more optimistic about Q2.

Global export market growth in 1999 is expected to be relatively weak, followed by some improvement in the next two years. Market growth this year is being held back mainly by the slackening of activity in the euro area. Important factors behind rising market growth in 2000 and 2001 are a gradual recovery in Southeast Asia and a cyclical upturn in the United Kingdom and Norway. Compared with the March Report, some upward revision has been made to market growth in 2000.

Some weakening of Sweden's competitive position is foreseen in the forecast period as a whole, mainly on account of a clear appreciation of the krona during 2000 and 2001. Some loss of market share is therefore foreseen. In the short run, however, there has been some improvement in the prospects for Sweden's competitive position, mainly on account of the weaker exchange rate. For 2000 and 2001, price shifts relative to the rest of the world are calculated to be small. To some extent, price restraint by Swedish firms is expected to counter the effect of an appreciating krona.

Exports and imports are both expected to be somewhat stronger in the forecast period than was assumed in the March Report.

All in all, export growth in both 1999 and 2000 is expected to be somewhat stronger than foreseen in the March Report. Import growth is likewise expected to be somewhat stronger, above all as a consequence of higher exports and investment. In 2001, a weakening of exports and imports is foreseen, mainly due to some slackening of private consumption and an appreciating krona.

Export growth is judged to be about 4.5 per cent in 1999, almost 6 per cent in 2000 and over 5 per cent in 2001, accompanied by import growth rates of about 5.5, almost 7 and over 6 per cent, respectively. The GDP contribution from net exports is estimated to be neutral in both 1999 and 2000, which is a slight improvement on the March assessment. For 2001, however, the contribution is expected to be slightly positive.

FISCAL POLICY

In the latter part of the 1990s, fiscal policy has been guided by two goals: the target of a consolidated public sector surplus (for 2000 and 2001: 2 per cent of GDP) and the ceiling on central government spending excluding debt interest expenditure. This spring it was for that additional expenditures which had been approved earlier could not be accommodated under the spending ceiling. Additional cuts in central government spending in both 1999 and 2000 were therefore announced in the Spring Bill. But even with these cuts, with an unchanged fiscal policy there is a risk of the spending ceiling being exceeded.

Fiscal policy is still expected to become more expansionary in the course of the forecast period. However, with the expenditure cuts for 1999 and 2000 that were announced in the Spring Bill (affecting labour market measures and subsidised medicine, for example), fiscal policy in these years is judged to be somewhat tighter than was assumed in the March Report. The Spring Bill indicates that an estimated margin for public sector transfers to households is being planned for 2000 and 2001 but neither the form nor the size of these transfers have been clarified. The Riksbank envisages that in view of the margin an unchanged fiscal policy is expected to provide in relation to the targets for government finance, fiscal policy will be eased during 2001. If the Government considers that central government finance were to permit it, however, a conceivable tax cut might be implemented already in 2000. The Riksbank's assumption, however, is that no new tax cuts for 2000 will be decided by the Government.

The view of public consumption has not changed since the March Report. The growth of public consumption is expected to remain below GDP growth throughout the forecast period.

Fiscal policy in 1999 and 2000 is expected to be somewhat tighter than assumed earlier but a more expansionary trend is still foreseen in the forecast period.

All in all, fiscal policy in 1999 and 2000 is estimated to be somewhat tighter than assumed in the March Report, given than there are no further tax cuts in 2000, but the effect on demand is judged to be less restrictive than in recent years. The growth of public consumption is put at just over 1 per cent in 1999, just under 1 per cent in 2000 and around 1 per cent in 2001.

PRIVATE CONSUMPTION

The annual growth of private consumption in 1998 reached 2.6 per cent, the strongest increase since

1987. The latest statistics suggest that growth is still good. Growth continues to come mainly from infrequent purchases. Preliminary figures indicate that Q1 retail turnover was over 5 per cent up on the same period the previous year. New car registrations by private individuals have also gone on rising.

Swedish households' expectations of their own economy in the coming twelve months remain optimistic and have stabilised at a level that is historically high. At the same time, however, households continue to be more pessimistic about general economic development in Sweden.

The general picture of consumption in the coming years has not changed since the March Report. Rising real wages, lower interest expenditure, higher employment and some tax relief are expected to stimulate private consumption in the forecast period. A further contribution in this respect is the latest repo rate cut

Rising real wages, lower interest expenditure, higher employment and some tax relief are expected to stimulate private consumption in the forecast period.

To sum up, the recent easing of monetary policy and the direction of fiscal policy provide grounds for continued optimism as regards private consumption in the coming years. The favourable tendencies in the labour market point in the same direction. Private consumption is judged to rise by over 3 per cent in 1999, around 3 per cent in 2000 and around 2.5 per cent in 2001, which represents some upward revision of the consumption forecast for the first two years. The trend in 2001 is judged to remain strong, though some fall-off is expected to come mainly from weaker consumption of durable goods.

INVESTMENT AND STOCKBUILDING

Total gross capital formation rose 9.6 per cent in 1998. Investment growth was particularly strong in the non-manufacturing corporate sector, with volume increases of 30-40 per cent in segments such as leasing and other business services, distributive trades and financial enterprises. Manufacturing investment, on the other hand, rose only 3.0 per cent, with a negative trend towards the end of the year. Residential investment and investment by public authorities rose 5.1 and 6.4 per cent, respectively. Although the annual volume growth of investment has averaged almost 5 per cent in the past five years, as a share of GDP gross capital formation is still relatively low. This is mainly because residential investment fell sharply at the beginning of the 1990s, partly due to changes in the system for housing finance.

In 1999, the international slowdown is expected to contribute to an unchanged annual volume of manufacturing investment. In the National Institute's business tendency surveys, a decreased proportion of firms report a shortage of production capacity. The February investment survey, however, points to a volume increase in the region of 5 per cent. Both the April survey and the purchasing managers index also point to a somewhat faster recovery. Manufacturing investment in 1999 is judged to be somewhat higher than expected in the March Report, partly on account of the better outlook for economic activity. In 2000 and 2001, investment growth is expected to remain considerably above the rate for GDP.

In the non-manufacturing corporate sector, investment is expected to go on rising, though at an appreciably more subdued rate than in 1998. Last year's volume growth may have been affected to some extent by occasional factors such as computer purchases by employees, the turn of the millennium and the adjustment of administrative systems to the introduction of the euro. In 1999, manufacturing activity is expected to have a negative effect on investment in segments of the corporate sector that are linked to manufacturing. Fairly high percentage growth rates are foreseen, however, for residential investment in the coming years. Investment by public authorities is also judged to go on rising in the forecast period, though at a lower rate than in 1998.

Stockbuilding during 1998 made a contribution to GDP growth of 0.3 percentage points. Business tendency data point to a deterioration in the stocks situation in manufacturing in 1999 Q1; the as-ofnow judgements on raw materials as well as finished goods show increased dissatisfaction with excessively large stocks, though this does not necessarily mean that these stocks have actually grown. The survey

Figure 11.

Private consumption and retail turnover. Volume, seasonallyadjusted quarterly data and moving 3-month average, respectively; index: 1991=100





data indicate some destocking of raw materials and some increase in stocks of finished goods.

All in all, gross fixed capital formation is expected to rise more than 5 per cent in 1999, almost 8 per cent in 2000 and over 7.5 per cent in 2001. The assessment of stockbuilding's contribution to GDP growth is broadly the same as in the March Report: a negative impact in 1999 and 2000 is followed by a neutral effect in 2001.

GDP

Growth prospects in Sweden have improved somewhat since the March Report. This partly reflects the combination of somewhat stronger international activity and a more favourable competitive position for Sweden. The repo rate cut in March is also judged to have some positive effects on investment in particular but also on private consumption. Moreover, there are signs that manufacturing activity is improving somewhat more quickly than envisaged earlier.

All in all, GDP growth is judged to be 2.5 per cent in 1999 and 3 per cent in both 2000 and 2001.

The weaker international trend, above all in Europe, is still

judged to have a certain downward effect on growth during 1999. A successive increase in domestic demand is foreseen, partly in the light of low interest rates. Together with some international recovery, it is judged that this will generate comparatively strong economic growth in Sweden in 2000 and 2001. All in all, annual GDP growth is judged to be 2.5 per cent in 1999, followed by 3 per cent in both 2000 and 2001.

EMPLOYMENT AND PRODUCTIVITY

Employment rose strongly towards the end of 1998 and the trend continued in the early part of this year. The increase has been strong in the private services sector, above all in business services and education, as well as in the local government sector. In the first four months of 1999 the number in employment was over 100,000 higher than a year earlier. In the latter half of 1999, employment growth is likely to be checked somewhat. The strong outturn so far this year still prompts an upward revision of the forecast for 1999. During 2000 and 2001, employment is expected to rise by an average annual figure of 50,000 persons.

Employment is expected to rise by an average of 50,000 persons a year in 2000 and 2001.

Figure 12. Manufacturing: confidence indicator and production. Net figure and percentage 12-month change



Sources: National Institute of Economic Research and Statistics Sweden.

The inflow to the labour force has been accelerating since last summer. This is explained both by the completion of the first year of the drive to enhance education and by the return of latent job-seekers to the labour force. Measures that will contribute to a further increase in the labour force were announced in the Spring Bill. During the forecast period, annual labour force growth is judged to be between 30,000 and 40,000 persons.

The unemployment rate is judged to be under 6 per cent in 1999, around 5.5 per cent in 2000 and under 5 per cent in 2001.

Productivity growth in 1999 is judged to be somewhat weaker than assumed earlier, partly in view of the strong increase in employment in the services sector, where productivity growth is relatively lower than in manufacturing. When manufacturing activity improves in 2000 and 2001, however, productivity growth is judged to be above 1.5 per cent, which is in line with the average for the period 1990-98.

CAPACITY UTILISATION

The various econometric estimates used by the Riksbank indicate that the annual level of the total output gap in 1998 was about -2 per cent. As the Swedish economy is expected to grow more rapidly than its potential output, in the forecast period the output gap is judged to narrow by degrees.

The Swedish economy is expected to grow more rapidly than its potential output; in the forecast period the output gap is therefore judged to narrow by degrees.

Capacity utilisation in manufacturing, as measured by Statistics Sweden, fell 1.4 percentage points from 1998 Q3 to Q4, to 88.7 per cent. The National Institute's business tendency surveys show that the level in manufacturing then continued to decline, from 85 per cent in December 1998 to 83 per cent in March 1999. The survey data also show that delivery times have gone on shortening and only around one-fifth of firms report that output is being restricted by the supply of production factors. The initial position in manufacturing for a period of good growth is thus relatively favourable. In the services sector, however, capacity utilisation is still very high in many types of business services, for example.

All in all, in the coming years the comparatively strong economic growth in Sweden is judged to reduce the existing supply of unutilised resources.

WAGES AND UNIT LABOUR COSTS

The brighter economic prospects in the coming twenty-four months are assumed to contribute to a somewhat stronger wage trend, above all in the private corporate sector. A large proportion of the current wage agreements will be up for renegotiation not later than in the first half of 2001. The forecast for 2001 therefore includes an initial assessment of wage tendencies after the next round of negotiations. The forecast productivity growth and the inflation expectations of labour market organisations point to average wage increases of 3.5-4 per cent in the forecast period. Moreover, falling unemployment and a narrowing output gap in the forecast period can be expected to lead to successively higher wage pressure. On the other hand, the real wage increases in recent years have been higher than expected and this may tend to subdue wage increases in the forecast period.

Wage increases in the forecast period are judged to average 3.5-4 per cent.

The increase in unit labour costs is judged to be somewhat higher than foreseen in the March Report. It is mainly higher wage increases that are expected to contribute in increased pressure from costs. During 1999, somewhat weaker productivity growth is also expected to add to unit labour costs.

MILLENNIUM EFFECTS ON ACTIVITY AND INFLATION

The transition to a new millennium little more than six months ahead calls for considerable adjustments in much of the economy and above all in the field of computer technology. It is conceivable that these preparations and adjustments will prove to be of a magnitude that has consequences for the real economy.

A variety of effects may arise. Additional or earlier IT investments and extra expenditure for consultants may generate increased demand up to the turn of this year. A temporary increase in production may also result from firms building up some additional stocks before the year-end so as to cope with any stoppages internally or among suppliers. Shifts in demand for certain categories of labour or goods may affect wage and price formation in segments of the economy. After the turn of the year, investment demand may then fall and stocks be reduced, leading to a temporary dip in production.

Effects of this type are probably at work in the economy over a couple of years rather than immediately before and after the turn of the millennium. Firms that need to replace hardware and software for the millennium transition will hardly do so at the last minute. In other words, the transition should already have had some effect on investment demand. In 1998, non-manufacturing investment in the corporate sector, for example, rose 15 per cent and it is possible that this sharp growth included increased IT investment for the millennium transition.

Macroeconomic effects may also arise if the millennium preparations are so inadequate that output is markedly disrupted. Such an effect on the real economy would probably be more concentrated to the turn of 1999.

Forecasters in different countries have attempted to estimate the impact of any effect on economic activity. However, as the assessments seem to rest on different assumptions and cover different assortments of effects, the picture they provide is not uniform. The impact of the millennium is not considered separately in the inflation forecast that is presented in this Report. The main reason lies in the difficulty in making a quantified distinction between IT investments occasioned by the millennium transition and those that would have been made in any event. Still, the transition can be said to have been considered in the sense that adjustments by households and firms ought to be included in statistics and indicators of planned and implemented investments, stocks assessments, wage statistics for different occupational groups and so on, material that is used in turn for the assessment of inflation.

Concerning the risk of macroeconomic shocks around the turn of the year on account of production stoppages, no sizeable risks of this kind are suggested by the available information. In a survey by the Federation of Swedish Industries, 90 per cent of firms saw a limited risk of their own operations being disrupted. Experience from earlier stoppages in some countries (major power breakdowns in New Zealand and Canada, for example) also suggest that the effects on the total economy would be small even though the sector concerned suffers appreciable harm.

It is conceivable that the risk of production being disrupted that is currently reported by Swedish firms will change as the year-end approaches. Moreover, farreaching international integration means that inadequate preparations in another country can affect production conditions in Sweden. It is therefore important to monitor the situation closely. The Riksbank studies macroeconomic statistics and indicators with particular reference to any signals of expected production stoppages and any signs of more marked shifts in demand or inflation on account of the millennium transition.

Price effects of deregulations

Although the Swedish electricity market was deregulated back in 1996, to date there has been very little effect on consumer prices, apparently because it has been necessary to install time metres. The abolition of this requirement as of November 1999 is expected to have considerable price effects. Certain tendencies for electricity prices to fall are already visible in the CPI, though the picture is complicated by a change of methods by Statistics Sweden. The reduction of electricity prices is calculated to total of about 10 per cent, with a downward effect on the CPI of about 0.3 percentage points in the forecast period as a whole.

Telephone prices may also go on falling. Reforms involving number portability (keeping the same number when changing operators) and equal access to the network, which come into force in the second half of 1999, will make it simpler to change operators and probably lead to increased competition and price pressure.

The decision on Agenda 2000, taken by Heads of State or of Government of the EU member states in March 1999, mainly concerns reforms of agricultural support, above all decreased price subsidies for grain crops and beef as well as compensation to farmers in the form of increased direct subsidies. Calculating the impact of these reforms on consumer prices is obviously difficult but Riksbank envisages a total CPI effect of almost one half of a percentage point spread over ten years, of which about half during 2000 and 2001.

In the light of new information, falling telephone and electricity prices are expected to have a downward CPI effect of about 0.2–0.3 percentage points, in addition to what was assumed in the March Report. Changes to farm subsidies in accordance with the final proposals in Agenda 2000, which could not be taken into account earlier, are calculated to make a contribution of -0.1 percentage point in both 2000 and 2001, which is rather more than assumed in the March Report. These factors tend to counter the higher price pressure associated with the stronger economic activity.

Effects of political decisions and interest expenditure

A number of changes to indirect taxes and subsidies have been presented since the March report, for instance in the Spring Bill. For 1999 there is the proposal to defer the tax on waste materials until 2000 and raise the ceiling for the "high-cost subsidy" on annual personal expenditure for medicines. The Government also proposes to prolong the temporary reduction of property tax on multi-family housing from 1999 to 2000 and introduce a maximum charge for day nurseries as of 2001.³⁰

The downward CPI effect of changes in indirect taxes, subsidies and interest expenditure is somewhat greater than in the March Report.

The CPI is also affected by earlier proposals and decisions. In 1999 the main downward effects come from the tax freeze on assessed values of owner-occupied housing, the indexing of energy taxes and the temporary cut in property tax on multi-family housing³¹ An upward effect comes from the termination of the tax reduction for housing repairs.

A return to indexing assessed values of owneroccupied housing as of 2001, after a freeze since 1997, has also been discussed and would have considerable consequences for the development of consumer prices. As in the March Report, it is assumed that indexing will not be reintroduced in 2001. Moreover, the reassessment of the taxable value of multi-family buildings in 2000 will result in new assessed values in 2001. Here, too, the Riksbank assumes that taxable values are frozen for 2001. The downward CPI effect from house mortgage interest expenditure is judged to be more marked than in the March Report, partly on account of the Riksbank's latest repo rate cut. All this combined means that, compared with that Report, the difference between the changes in the CPI and the UND1X is expected to be somewhat larger in 1999 and somewhat smaller in 2000.

To sum up, changes in interest expenditure, indirect taxes and subsidies are judged to have a downward effect on CPI inflation twelve months ahead of 0.8 percentage points, followed by a downward effect of 0.3 percentage points in twenty-four months time. 30 Day nursery charges are not currently included in the CPI but as it has been decided that they will be included in the HCIP as of 2001, the Riksbank has chosen to assume that they will be incorporated in the CPI from the same date.
31 Statistics Sweden treats changes in the property tax on multi-family housing as an indirect effect; indirect effects of changes in indirect taxes and subsidies are included in Statistics Sweden's index of underlying inflation.

Table 2.

CPI contributions from changes in indirect taxes, subsidies and interest expenditure. Percentage points

| | 1999 Dec. | 2000 June | 2000 Dec. | 2001 June |
|--|-----------|-----------|-----------|-----------|
| Altered indirect taxes and subsidies, direct effects | 0.0 | 0.0 | 0.0 | 0.0 |
| Temporary freeze on residential property assessment, | | | | |
| direct effect | -0.1 | -0.1 | -0.1 | -0.1 |
| Change in interest expenditure | -0.8 | -0.8 | -0.6 | -0.2 |
| Total contribution to CPI | -0.9 | -0.8 | -0.6 | -0.3 |

Note. If "Total contribution to CPI" is adjusted for UND1X being only about 93 per cent of CPI then the difference in inflation as measured by CPI and UND1X is obtained. Source: The Riksbank.

| Table 3. | | 1999 Dec. | 2000 June | 2000 Dec. | 2001 June |
|-------------------|--|-----------|-----------|-----------|-----------|
| decisions | Maximum day nursery charge | 0.0 | 0.0 | 0.0 | -0.1 |
| Percentage points | Altered subsidy for medicines | 0.2 | 0.0 | 0.0 | 0.0 |
| r ereentage penne | Property tax on multi-family buildings | -0.1 | 0.0 | 0,0 | 0.1 |
| | Total contribution to UND1X | 0.1 | 0.0 | 0.0 | 0.0 |

Source: The Riksbank.

Inflation expectations

LOW INFLATION EXPECTATIONS DESPITE SLIGHT INCREASE

Implied forward interest rates are commonly used to assess expectations of the future path of short-term interest rates. For the short as well as the medium term, the forward rate tendency largely reflects market expectations of future monetary policy and inflation. The long-term forward interest rates mainly provide information about confidence in general economic policy's commitment to price stability and the long-term global real interest rate.

The medium-term forward rates (maturities of one to two years) have risen about 0.3 percentage points since the March Report (Annex: Fig. 37). This can indicate somewhat higher inflation expectations as well as a perception among money market players that in the coming years monetary policy will be given a somewhat less expansionary turn.

Apart from a temporary increase during the financial turbulence last autumn, the long-term interest rate differential with Germany has been relatively stable for a considerable time. To date this year the differential has averaged around 0.3 percentage points (Annex: Fig. 39). Quite recently, however, the spread has widened to approximately 0.5 percentage points. Even so, the picture suggests that confidence in the inflation target policy remains stable.

Inflation expectations in the longer run are in line with the target.

Another indication of market expectations of future inflation is provided by the long-term inflation expectations that can be derived from the difference between real and nominal forward bond rates (5-15 years).³² This difference is approximately 1.9 percentage points, which is somewhat higher than at the time of the March Report (Annex: Fig. 41). As the real bond rates yield compensation for inflation in terms of the annual percentage change in the short-term CPI index, the forward interest rate dif-

ferential above points to expectations of inflation in the longer run that are in line with the target.³³

SURVEYS SHOW SOME INCREASE

INFLATION EXPECTATIONS, BUT ARE STILL LOW A number of surveys of inflation expectations have been published since the March Report. The general impression is that these expectations are rising. The short-run expectations are below 2 per cent by a broad margin, the medium-term expectations (up to twenty-four months) are somewhat below the target and the long-term expectations are in line with the Riksbank's target (Table 4 and Annex: Figs. 42 and 43).

The May survey by Statistics Sweden indicates rising inflation expectations among all the categories interviewed and for virtually all time horizons. The largest changes since the previous survey concern money market agents and purchasing managers in manufacturing.

In April the rate of inflation expected by households in the coming twelve months was 0.9 per cent, an increase of 0.1 percentage point compared with the previous survey. The corresponding expectations in manufacturing in March averaged 0.6 per cent, an increase of 0.1 percentage point compared with December. The rate of 0.7 per cent expected in the services sector³⁴ in March was the same as in December 1998.

³² These rates are the nominal and real ten-year rates in current five-year contracts.

³³ The annual change in the short-term index is the legal definition of inflation that is used, for example, to adjust the level of the base amount and indexed bonds. Statistics Sweden and the Riksbank, on the other hand, measure inflation in terms of 12-month change figures. The main difference between the two methods lies in how the year-end adjustment of weights is handled. On average, the annual change in the short-term index has been about 0.2 percentage points below the rate of inflation measured with 12-month change figures.

³⁴ Inflation expectations in the services sector are represented here by an unweighted average of expectations in the sub-sectors.

Table 4.

Inflation expectations in May 1999. Annual percentage change. Statistics Sweden's survey unless otherwise indicated

| Annual percentage change in CPI in: | | 1 year | | 2 years | 5 years |
|--|-----|--------------------|-----|--------------------|-------------------------|
| Money market agents | 0.9 | (0.2 /0.1) | 1.4 | (0.3 /0.4) | 1.9 (0.2 /0.4) |
| Employer organisations | 1.0 | (0.1 /0.3) | 1.3 | (0.1 /0.4) | 1.7 (0.1 /0.5) |
| Employee organisations | 1.2 | (0.1 /0.1) | 1.5 | (0.1 /0.2) | 1.8 (0.0 /0.2) |
| Purchasing managers, trade | 1.3 | (0.2 /0.2) | 1.6 | (0.2 /0.4) | 1.9 (0.2 /0.4) |
| Purchasing managers, industry | 1.4 | (0.2 /0.2) | 1.7 | (0.3 /0.4) | 2.0 (0.2 /0.4) |
| Aragon's survey | | | | 1.2 | 1.8 |
| Households (HIP) | | 0.9 | | | |
| Manufacturing firms (tendency surveys) | | 0.6 | | | |
| Services firms (tendency surveys) | | 0.7 | | | |
| Implicit inflation expectations: | | | | 1-2 years | 3-5 years |
| Money market agents | | | 1.9 | (0.4 /0.7) | 2.2 (0.1 /0.4) |
| Employers organisations | | | 1.6 | (0.1 /0.5) | 2.0 (0.1 /0.6) |
| Employees organisations | | | 1.8 | (0.1 /0.3) | 2.0 (- 0.1 /0.2) |
| Purchasing managers, trade | | | 1.9 | (0.2 /0.6) | 2.1 (0.2 /0.4) |
| Purchasing managers, industry | | | 2.0 | (0.4 /0.6) | 2.2 (0.1 /0.4) |
| Aragon's survey | | | | | 2.2 |

Note. The figures in parentheses are the changes in percentage points from Statistics Sweden's February survey (bold type) and from Prospera's April survey. Sources: Statistics Sweden, Prospera Research AB, National Institute of Economic Research and Aragon

Fondkommission.

Figure 13. Money market agents' inflation expectations. Per cent



* From Statistics Sweden, others Prospera Research AB. Sources: Prospera Research AB and Statistics Sweden.

CHAPTER 3

Inflation assessment

This chapter summarises the Riksbank's assessment of inflation prospects, given that the repo rate is left unchanged at 2.90 per cent. The principal features of the main scenario (the price trend in the coming twenty-four months that is considered most probable) are described, followed by the Riksbank's appraisal of the uncertainties and risks in the inflation prospects.

Inflation prospects in the main scenario

Growth in the OECD area is judged to be marginally stronger than forecast in the March Report. The main explanation is the continuation of the strong trend in the US economy. In the euro area, on the other hand, manufacturing activity has weakened and there are few signs of a rapid recovery, though the ECB's interest rate cut is expected to have a positive effect on growth in 2000 and 2001. It is now expected that economic growth in Norway will be somewhat weaker this year, while the Danish and British economies are somewhat stronger in 2000.

The krona has been by and large stable since the time of the March Report. As previously, a continued appreciation is assumed, accompanied by a gradual increase in long bond rates. With the largely unchanged assessment of the exchange rate and the repo rate cut at the end of March, the combined effect on demand from interest rates and the exchange rate is judged to be somewhat more expansionary than assumed in the previous Report.

The international price trend is expected to remain subdued. Together with the krona's assumed appreciation, this implies weak external price pressure. However, a somewhat weaker path for the exchange rate and higher world market prices for oil and, to some extent, manufactured products does mean that in the short term, import prices are expected to rise somewhat more than foreseen in the March Report. Still, for 2000 and 2001 the forecast is largely unchanged.

Stronger economic activity in Sweden implies somewhat higher inflationary pressure.

The weak international prospects, above all in Europe, are expected to leave their mark this year on the production of Swedish manufactured exports and investment. Even so, economic activity in Sweden in the forecast period is expected to be somewhat stronger than assumed in March. A successive increase is foreseen in domestic demand, partly in view of the low level of interest rates. Together with some recovery in international activity, this points to GDP growth rates of 2.5 per cent in 1999 and 3 per cent in both 2000 and 2001.

There is still a comparatively large stock of unutilised resources in the economy, but it will probably be utilised successively in the coming 24 months, which is likely to entail somewhat higher inflationary pressure. The somewhat better growth prospects lead to the assumption of an annual rate of wage increases of 3.5-4 per cent, which is somewhat more than forecast in the March Report. But as productivity growth is expected to remain strong, the increase in labour costs is moderate.

There has been some increase in inflation expec-

tations but the level is still low. In the coming twentyfour months, inflation is expected to be below 2 per cent. Expectations for the somewhat longer run are in line with the inflation target.

Deregulations in the telephone and electricity markets counter the somewhat higher price pressure associated with the improved economic prospects.

With the better prospects for the Swedish economy, underlying inflation is judged to be somewhat higher than foreseen in the March Report. Deregulations in the telephone and electricity markets, together with proposed changes in agricultural subsidies in connection with Agenda 2000, are calculated to subdue prices somewhat more than was assumed in March. These factors tend to partly counter the increase in underlying inflation that is associated with improved economic prospects (Fig. 14). All in all, underlying inflation, measured as UND1X, is judged to be 1.9 per cent twelve months ahead and 2.0 per cent after twenty-four months.

Underlying inflation, measured as UND1X, is judged to be 1.9 per cent twelve months ahead and 2.0 per cent after twenty-four months. In the main scenario, CPI inflation is judged to be below the target and to be 1.0 per cent twelve months ahead and 1.6 per cent after twenty-four months. This is broadly the same as the assessment of consumer prices in the March Report (Fig. 14). The continued fall in interest expenditure, partly on account of the Riksbank's repo rate cut in March, is the main factor here. Consumer prices will also be affected by a number of Government proposals in, for example, the Spring Bill. The total effect of those and other proposals is estimated to raise the level of the CPI almost 0.1 percentage point in 1999, followed by a largely neutral impact in 2000 and 2001.

UND1X differs from the CPI in that the latter includes changes in house mortgage interest expenditure, indirect taxes and subsidies. The combined effect of these transitory factors on the CPI is estimated to be -0.8 percentage points twelve months ahead and -0.3 percentage points after twenty-four months. The Riksbank normally disregards these factors when formulating monetary policy because they are judged to have no permanent effect on either inflation or inflation expectations. Consumer prices are also susceptible to transitory factors of other kinds, for example prices movements for

Figure 14.

CPI and UND1X. Outcome and the main scenario in this and the previous Report.



Note. In the March Report the main scenario was based on an unchanged reported of 3.15 per cent, while the present Report starts from a reported of 2.90 per cent in the coming twenty-four months. Sources: Statistics Sweden and the Riksbank.

| Table 5.Inflation forecasts. | | Annual rate 1999 | Annual rate 2000 | 12-month rate june 2000 | 12-month rate june 2001 |
|------------------------------|---------|---------------------|---------------------|----------------------------|----------------------------|
| Percentage change | CPI | 0.2 | 1.0 | 1.0 | 1.6 |
| | UND1X | 1.4 | 1.8 | 1.9 | 2.0 |
| | UNDINHX | 1.9 | 2.0 | 2.1 | 2.5 |
| | HICP | 0.6 | 18 | 2.0 | 19 |

Source: The Riksbank

imported goods and commodities. At present the magnitude of such transitory factors is judged to be such that they are of no consequence for the formation of monetary policy. This means, that in practice monetary policy is currently based on an assessment of inflation as measured by UND1X.

Risk spectrum

The inflation assessment in the main scenario is the path the Riksbank considers most probable. However, the forecasts for economic activity and inflation include elements of uncertainty and this risk spectrum is also relevant in the formation of monetary policy.³⁵

The inflation assessment in the March Report was judged to carry some downside risk on account of the possibility that international activity would be weaker than envisaged in the main scenario. The chief threat to world economic growth continues to be the financial imbalances in the United States, where the high activity is being prolonged by strong consumption growth, low saving and stock market highs with notably optimistic profit expectations. A stock market collapse in the United States would radically alter the prospects of a recovery in Europe. A weaker price trend could also come from more structural factors, such as persistently strong competitive pressure generated, for example, by the impact of information technology or the establishment of EMU.

At the same time, it is conceivable that the more expansionary monetary policies in Europe and Japan will lead to a stronger recovery, particularly if they were to be combined with growth-enhancing structural measures. Moreover, the global financial unrest has continued to subside. The effects to date of the Brazilian crisis have turned out to be small and some recovery is discernible in parts of Asia. Against this background, the risk of a longer and more profound international economic slowdown is judged to have receded. Another factor is the oil price rise, which could continue at a faster rate than assumed in the main scenario. All in all, the spectrum of international risks is symmetrical.

The risks for domestic inflation also appear to be symmetric around the main scenario. It is conceivable that the growth of domestic demand will be stronger than envisaged in the main scenario. While it is difficult to tell just how this would affect inflation prospects, there is naturally a risk of the price rise being stronger than allowed for in the main scenario. An important factor in this context is the future direction of fiscal policy. The Riksbank envisages the restraining effect on demand from fiscal policy will be less marked than during the budget consolidation in recent years. However, with the measures for 1999

³⁵ The main scenario's inflation forecast and the uncertainty interval presume that the monetary stance is unchanged in the coming twenty-four months. In other words, the interval illustrates the uncertainty in the inflation forecast on which monetary policy is currently based. There is less uncertainty, however, about the actual development of inflation than the interval suggest, because the monetary stance is continuously adapted in order to steer inflation in the desired direction.

and 2000 that were announced in the Spring Bill, fiscal policy in these years now seems to be somewhat less expansionary than was assumed in the March Report. There is also a risk of the krona not appreciating as quickly as the main scenario assumes.

The main downside risk has to do with the fact that in recent years inflation has been lower than historical relationships indicated. The difficulties in estimating potential output and unutilised capacity have contributed to this. Moreover, the part played by lower inflation expectations has probably been underestimated. In the coming years, with the prospect of stronger activity and increased inflationary pressure, it will be even more important to detect indications of bottlenecks and capacity shortages in order to assess the validity of earlier relationships.

The risk of a more lengthy international economic slowdown has decreased and the risk spectrum is therefore symmetrical around the main scenario.

All in all, the risk of a more lengthy international economic slowdown has decreased since the March Report, which gives a risk spectrum that is symmetrical around the main scenario. From Fig.15, which presents the Riksbank's assessment of uncertainties surrounding the inflation forecast in the main scenario, it is also evident that the various upside risks balance the downside risks.³⁶ As the risk spectrum is judged to be symmetrical, the uncertainty intervals above and below the main scenario's forecast are the same width. On the whole, as can be seen from the width of the uncertainty interval, the inflation prospects seem to be about as difficult to assess as at the time of the March Report.

The risk spectrum for underlying inflation, measured as the annual change in UND1X, is also symmetrical (Fig. 16).

As monetary policy is formulated primarily on the basis of an assessment of price tendencies twelve to twenty-four months ahead, the inflation prospects with this horizon are of particular interest. In the main scenario, the 12-month rate of CPI inflation is expected to be 1.0 per cent in June 2000 and 1.6 per cent in June 2001. As the risk spectrum is broadly balanced, the mean and the median coincide.

The probabilities of inflation twelve and twenty-four months ahead being inside certain intervals are presented in Table 6. There is little likelihood of CPI inflation being above 2 per cent in twelve months time; the probability of this twenty-four months ahead is greater. There is a considerable risk, on the other hand, that inflation in the forecast period will be outside the lower tolerance limit. This mainly has to do with transitory effects on consumer

Figure 15.

CPI with uncertainty interval. Percentage 12-month change



Note. The uncertainty intervals show the 50, 75 and 90 per cent chances of CPI inflation being inside the respective range under the assumption of unchanged repo rate. The dotted line shows the forecast in the main scenario. The horizontal lines at 2 per cent and at 1 and 3 per cent represent, respectively, the Riksbank's inflation target and the tolerance interval for the annual change in the CPI. Sources: Statistics Sweden and the Riksbank.

| Table 6. | | CPI<1 | 1 <cpi<2< th=""><th>2<kci<3< th=""><th>CPI>3</th><th>Total</th></kci<3<></th></cpi<2<> | 2 <kci<3< th=""><th>CPI>3</th><th>Total</th></kci<3<> | CPI>3 | Total |
|---|------------------|-------|---|--|-------|-------|
| 12-month CPI inflation. Percentage probability | 2000 (June-June) | 50 | 40 | 9 | 1 | 100 |
| | 2001 (June-June) | 33 | 30 | 23 | 14 | 100 |
| | | | | | | |

Note. The figures denote the probability of inflation being below 1 per cent, between 1 and 2 per cent, between 2 and 3 per cent, and over 3 per cent. Source: The Riksbank.

| Table 7. | | UND1X<1 | 1 <und1x<2< th=""><th>2<und1x<3< th=""><th>UND1X>3</th><th>Total</th></und1x<3<></th></und1x<2<> | 2 <und1x<3< th=""><th>UND1X>3</th><th>Total</th></und1x<3<> | UND1X>3 | Total |
|---|------------------|---------|---|--|---------|-------|
| 12-month UND1X inflation. Percentage probability | 2000 (June-June) | 9 | 46 | 39 | 6 | 100 |
| | 2001 (June-June) | 21 | 30 | 29 | 20 | 100 |

Note. The figures denote the probability of inflation being below 1 per cent, between 1 and 2 per cent, between 2 and 3 per cent, and over 3 per cent.

prices in connection with falling interest expenditure.

However, inflation measured as UND1X, which excludes transitory effects from changes in indirect taxes, subsidies and interest rates, will probably be inside the tolerance interval for the development of consumer prices up to the end of the forecast period. The probability of UND1X inflation being below 2 per cent is judged to be somewhat greater than the probability of it exceeding that level. Compared with the March Report, however, the situation is less clearcut. The forecast rate in the main scenario is somewhat higher and the risk of a longer international





economic slowdown has decreased, which means that the upside and downside risks in the inflation assessment are now fairly well balanced.

The conclusion from the reported assessments is that, excluding transitory effects from changes in indirect taxes, subsidies and interest rates, and given that the repo rate remains unchanged at 2.90 per cent, inflation twelve to twenty-four months ahead will be marginally below the Riksbank's target. But the deviation is small, particularly when the altered risk spectrum is taken into account. The risk of a more lasting international economic slowdown is judged to have decreased. The risk spectrum now appears to be fairly well balanced around the main scenario.

36 For an account of how the uncertainty interval is derived, see Blix, M. & Sellin, P (1999, forthcoming), Inflation forecasts with uncertainty bands, *Quarterly Review*, Sveriges Riksbank; for a fuller analysis, more focused on models, see *idem* (1999), *Uncertainty bands for inflation forecasts*, Sveriges Riksbank Working Paper no. 65.

INFLATION ASSESSMENTS AND MONETARY POLICY

The target for monetary policy is a 2 per cent annual change in the CPI, with a tolerance interval of ± 1 percentage point in the medium run.

Policy is constructed mainly in the light of an assessment of price developments in the coming twelve to twenty-four months. In each Report the time perspective is shifted approximately one quarter into the future. This means that even if the Riksbank's appraisal of future economic activity and inflation is unchanged, different monetary policy conclusions may be called for because the period being assessed has shifted ahead. For the time being, monetary policy will be based primarily on an assessment of consumer price tendencies from 2000 Q3 up to and including 2001 Q2.

The inflation assessment in the main scenario is the forecast that the Riksbank's regards as most probable. But as the prediction of future inflation is not a straightforward matter, the Riksbank also assesses the uncertainties in inflation's future path. In practice, therefore, the overall picture of inflation prospects consists of an assessment of probabilities. Together with a main scenario—the most probable outcome—a number of risk scenarios are weighted into the final assessment on which the formation of monetary policy is based. The uncertainty surrounding the main scenario is not necessarily symmetric. Upside risks predominate at times, while on other occasions there may be a greater probability of inflation being lower than in the main scenario. The assessment in the main scenario is accordingly supplemented by the appraisal of the risk spectrum, which can constitute an important argument for tightening or loosening the monetary stance.

Monetary policy is sometimes described as follows: if the overall picture of inflation prospects (based on an unchanged repo rate) indicates that in twelve to twentyfour months time inflation will deviate from the target, then normally the repo rate should be adjusted to counter the deviation. In this context it may be worth mentioning, however, that the formation of monetary policy can be influenced by the inflation assessment's uncertainty as such. A high degree of uncertainty can be a reason for a more cautious attitude, thereby avoiding excessively large fluctuations in interest rates and the formation of expectations.

There are two grounds for refraining at times from directing monetary policy so that the CPI target is fulfilled in twelve to twenty-four months time. One is that in the relevant time perspective consumer prices may be pressed up or down by a factor or factors with an effect on inflation that is not expected to be permanent. Examples of such factors are changes in interest expenditure and altered taxes and subsidies. The other ground is that, after a major deviation, a rapid return to the targeted rate may be costly for the real economy. If either of these situations applies, the magnitude of the deviation from the CPI target that may be motivated twelve to twenty-four months ahead is clarified by the Riksbank in advance.

INFLATION IN THE 1990S

In many countries the path of inflation and real economic activity in the 1990s seems to have developed at odds with historical experience of the relationship between these two variables. This has generated a debate, above all perhaps in the United States, as to whether, for example, the comparatively stable shortrun relationship between real activity and inflation (the Phillips curve) that was previously obtained needs to be revised. Some observers argue, moreover, that the macro economy is now in a new structural situation (the 'new economy') whereby, for various reasons, higher growth than before can be achieved without necessarily generating inflationary tendencies.³⁷

A similar debate is in progress in Sweden, where inflation has been lower than some observers, including the Riksbank, had envisaged, even though growth in this period has been comparatively good historically, with high capacity utilisation in manufacturing.

An econometric model can be used to investigate whether the relationship between real activity and inflation has changed. Note that as all models of this type inevitably start from some simplified assumptions, the results must be interpreted cautiously and regarded simply as pointers for a more comprehensive assessment.

The analysis starts from the following decomposition of registered inflation:

$$\boldsymbol{\pi}_t = \boldsymbol{\pi}_t^{LS} + \boldsymbol{\pi}_t^{E} + \boldsymbol{\pi}_t^{T}, \qquad (1)$$

where π_t is the measured inflation rate, π_t^{LS} long-run inflation, π_t^{E} the component of inflation generated by cyclical fluctuations in the economy (often regarded in turn as an indicator of variations in aggregate demand), and π_t^{T} the component of inflation generated by various types of transitory effects and supply shocks, for example changes in indirect taxes, subsidies and oil prices.³⁸ Restrictions on the models for the individual components (π_t^{LS}, π_t^{E} och π_t^{T}) are such that it can be demonstrated that in long-term equilibrium measured inflation and long-run inflation are identical. From these restrictions it also follows that only *deviations* from π_t^{LS} covary with cyclical real economic fluctuations, which with reference to Phillips-curve theory means that π^{LS} should represent *expected inflation*.

The picture of the inflation process conveyed by the model agrees in important respects with other analytical approaches (used by the Riksbank as well as other observers) and with the overall picture outlined in recent Inflation Reports. The most notable finding is perhaps, as shown in Fig. B12, the marked decline of expected inflation in the 1990s. Today, expected inflation as measured in the model is broadly in line with the Riksbank's inflation target, which implies strong confidence in the target and means that the low-inflation regime can be said to be relatively firmly established.³⁹

Another conclusion from Fig B12 is that the level of demand has had an appreciable downward effect on inflation almost continuously in the 1990s but that even supply effects and transitory factors of various types have exerted an appreciable downward influence.⁴⁰ This picture of inflation's path can be said to indicate that monetary policy in the 1990s has been rather successful in bringing expected inflation down to a more favourable level but that overall measured inflation has also been lower as a result of a weak demand trend and various more transitory factors. Given the chosen specification, in 1998 Q4 the contribution from the latter type of effects was as much as -1.6 per cent (-2.1 per cent including the contribution from supply shocks).⁴¹

The dominance of falling expected inflation in the 1990s makes it difficult to analyse the partial relationship between demand and inflation. There is as of today no strong indication of a significant change in this relationship. While the reduction of expected inflation does indicate that the average *level* of measured inflation will be lower in the future, it is thus not certain that inflation's *cyclical fluctuations* have decreased. It is conceivable, however, that the development of inflation expectations also plays some part in inflation's short-run fluctuations, in which case the result could be a lower average *level* as well as lower *variability* even though the direct relationship between demand and inflation has not changed.

The picture conveyed by the model agrees in essen-

tials with the perception on which the Riksbank's current main scenario for future inflation is based. The lowinflation regime is assumed to be relatively well established, which implies that inflation will not return-via a marked upward adjustment of expectations—to the high average levels noted in the 1970s and '80s. It is, of course, necessary to be alert so that monetary policy credibility does not decline and inflation expectations start to rise sharply. A prompt, resolute monetary policy response would be called for in such a situation. In the Riksbank's present main scenario, however, the existence of unutilised resources, together with transitory effects from changes in indirect taxes, subsidies and interest expenditure, explains why inflation is currently below the 2 per cent target. As demand improves and effects of a more transitory nature subside, inflation is expected to rise towards the Riksbank's target.

37 For a discussion and analysis of conditions in the United States, see Gordon, R.J. (1998), Foundations of the Goldilocks economy: supply shocks and time-varying NAIRU, *Brookings Papers on Economic Activity 2.* See also the box on pp. 24-25 in this Report.

38 A discussion of the model was presented in a box on pp. 35–37 in *Inflation Report 1999:1.* The approach is described in Apel, M. & Jansson, P. (1999), A *Parametric Approach for Estimating Core Inflation and Interpreting the Inflation Process*, Sveriges Riksbank Working Paper no. 80.

39 Note that expected inflation in the model is somewhat higher than the expected rate derived from survey data, at least in the latter part of the study period. It is not surprising, however, that different methods do not yield identical results for inflation expectations. Moreover, when allowance is made for the purely statistical nature of certain differences, the discrepancies are less dramatic.

40 In the specification used here, the origins of transitory effects are changes in the short-term nominal interest rate, the nominal oil price, nominal import prices and indirect taxes; supply shocks are approximated with changes in the real oil price and productivity.

41 As the decomposition in (1) is also affected by a constant, the contributions from the various components do not sum exactly to the rate of measured inflation. Moreover, the aggregate contribution from the components includes indirect as well as direct effects on inflation.



CPI inflation and underlying factors. Percentage 12-month change



Annex

Figure 1.

CPI, HICP* and GDP deflator. Percentage 12-month change



*Harmonised index for international comparisons of consumer prices.

Note. The horizontal lines from 1995 onwards represent the Riksbank's tolerance interval for the annual change in the CPI.

Sources: Statistics Sweden and the Riksbank.



Note. The figures in parentheses are the component's CPI weight in 1999. Sources: Statistics Sweden and the Riksbank.

6 5 4 3 3 2 0 -1 1992 1994 1996 1997 1998 1999 1993 1995 - UNDINHX CPI UND1X

Note. UND1X is defined as the CPI excluding interest expenditure and direct effects of changes in indirect taxes; UNDINHX is the CPI excluding interest expenditure, goods that are mainly imported and direct effects of changes in domestic indirect taxes. The horizontal lines from 1995 onwards represent the Riksbank's tolerance interval for the annual change in the CPI. Source: Statistics Sweden.

Figure 2.

CPI components: goods, housing and services. Percentage 12-month change

Figure 3.

CPI and underlying inflation. Percentage 12-month change

Figure 4.

CPI components: domestic and imported inflation. Percentage 12-month change



Note. The figures in parentheses are the component's CPI weight in 1999. Source: Statistics Sweden.

Figure 5.

Producer and consumer prices for goods. Percentage 12-month change







Figure 6.

Import prices to producers. Percentage 12-month change

Note. The figures in parentheses are the component's share of the 1999 Import Price Index excl. products from agriculture and forestry, hunting and fishing. Source: Statistics Sweden.

Figure 7. CPI: market prices and administered prices. Percentage 12-month change



Note. The figures in parentheses are the component's CPI weight in 1999. Series are revised for altered tax calculations and definitions.

Sources: Statistics Sweden and the Riksbank.





Note. The sum of Services at administered prices, Housing rents and part of Owner-occupied housing excl. interest expenditure constitutes the CPI item that is usually labelled Goods and services at administered prices.

Sources: Statistics Sweden and the Riksbank.

Figure 9.

Crude oil price index and import-weighted commodity price index excl. crude oil. Daily quotations, January 1996=100



Note. The commodity price index covers aluminium, copper, nickel, zinc, gold, silver, lead and tin, each weighted for its annual share of total Swedish imports; the aggregate share is approximately 2 per cent, while the share for crude oil is about 3 per cent (1998). Quotations until 21 May 1991. Sources: Ecowin, Statistics Sweden and the Riksbank.





Note. The ten-year T-bond rate refers for 1992 to the Swedish issue no. 1030, maturing on 15 June 2001, for 1993 to issue no. 1033, maturing on 5 May 2003, for 1994, 1995 and 1996 to issue no. 1035, maturing on 9 February 2005 (from end October 1996 to end 1996 to issue no. 1038, maturing on 25 October 2006), for 1997 to issue no. 1037, maturing on 15 August 2007, and for 1998 to issue no. 1040, maturing on 5 May 2008. Source: The Riksbank.



Source: The Riksbank.

Table 1.

Figure 11.

treasury paper.

points

Long-term (10-year) interest rate differential with German

Daily and weekly quotations,

respectively; percentage

Interest rate and exchange rate expectations of money market agents in May 1999; expectations in March 1999 in parentheses.

| In 3 months | In 1 year | In 2 years |
|---------------|--|---|
| 2.90 (3.00) | 3.15 (3.00) | 3.50 (3.50) |
| 125.0 (124.0) | 122.3 (120.0) | 120.0 (120.0) |
| 8.90 (8.85) | 8.80 (8.70) | 8.70 (8.60) |
| | In 3 months 2.90 (3.00) 125.0 (124.0) 8.90 (8.85) | In 3 months In 1 year 2.90 (3.00) 3.15 (3.00) 125.0 (124.0) 122.3 (120.0) 8.90 (8.85) 8.80 (8.70) |

Note. The survey data were obtained on 8 March and 10 May 1999 and represent expectations of rates 3, 12 and 24 months ahead.

Median, per cent and index: 18 November 1992 = 100 Sources: Statistics Sweden.

Figure 12. Actual and expected Swedish and German repo rates. Daily quotations, per cent

Figure 13.

1999.

cent

Market expectations of

Mean and 90 per cent

confidence interval; per

repo rate 6 months ahead,

1 Januay 1996 to 25 May



Note. As of 1999 the German rate has been replaced by the ECB's instrumental rate. Source: The Riksbank.

10 10 9 9 8 8 Ν 7 7 6 6 5 5 4 4 3 3 2 May '96 Jan. '97 May '97 Sep. '97 May '98 May '99 Jan. '96 Sep. '96 Jan. '98 Sep. '98 Jan. '99

Note. The data are plotted on the date of the expectations and are estimated with the Longstaff-Schwartz equilibrium model, given the current money market rates and the volatility of the short-term interest rates (see Inflation Report 1998:3, pp. 15–16). Source: The Riksbank.



Effective nominal TCW exchange rate. Daily quotations, index: 18 November 1992=100

Figure 14.



Figure 15.

Real effective exchange rate derived from export prices, consumer prices and unit labour costs in manufacturing. Index: 18 November 1992 = 100



Note. Real exchange rate calculated as foreign prices/costs divided by Swedish prices/costs, all expressed in a common currency; an increase in the index accordingly stands for a depreciation of the krona's real exchange rate and thus a strengthened competitive position. Sources: IMF and the Riksbank.



Note. The non-bank sector consists of households, firms and local authorities. From January 1995 onwards the figures include banks' repos with the non-bank sector. Lending by housing institutions has been adjusted for the transfer of state housing loans to this category in July 1995. Source: The Riksbank.



Note. The interest ratios show household gross interest expenditure relative to disposable income before and after tax relief; the debt ratio shows household debt relative to annual disposable income. Sources: Statistics Sweden and the Riksbank.

Figure 16.

Lending by credit institutions to resident non-bank and household sectors; bank lending to resident non-bank sector. Percentage 12-month change

Figure 17.

Household sectors' debt position. Per cent





Note. MO covers the resident household and corporate sectors' holdings of banknotes and coins; M3 covers M0 plus the non-bank sectors' bank deposits and certificates of deposit. Source: The Riksbank.



Source: Ecowin.

Figure 20.

Figure 19.

change

Inflation: European Union,

United States and Japan. Annual percentage

Consumer confidence: Sweden, euro area and United States. Seasonally adjusted, index: 1985=100 and net figures



Source: Ecowin.





Note. Riksbank forecast for OECD 1998. Sources: OECD and Statistics Sweden.

Figure 22. Manufacturing confidence: Sweden, euro area and United States Net figures





Figure 23.

External debt is and balance on current account. Per cent of GDP; year-end level and moving 4-quarter average, respectively



Note. External debt is defined as net of all domestic sectors' foreign assets and liabilities. Source: The Riksbank.





Figure 25. Price index for owneroccupied housing (1981=100) and Stockholm Stock Exchange share price index (30 December 1979=100)



Note. Month-end share prices.

Sources: Statistics Sweden and Stockholm Stock Exchange.

Figure 26. Implied distribution of

OMX index returns. Calculated from 60-day option prices



Note. The implicit risk-neutral probability distribution of the yield on the OMX index 60 days ahead, estimated on three occasions on the basis of listed prices for 60-day options (see Inflation Report 1998:3). Source: The Riksbank.

Figure 27.

Private consumption and retail turnover. Volume, seasonally-adjusted quarterly data and moving 3-month average, respectively; index: 1991 = 100



Source: Statistics Sweden.

Figure 28.

Households' personal economic expectations and private consumption. Net figures and percentage 12-month change



Note. The statistics on households' personal economic expectations were revised in October 1995. Source: Statistics Sweden.



Government borrowing requirement: total and excluding interest expenditure. Moving 12-month total; SEK billion



Source: National Debt Office.

Figure 30. Unemployment and job vacancies. Seasonally-adjusted monthly data; per cent and thousands, respectively



Sources: National Labour Market Board and Statistics Sweden.

Figure 31. Employment (persons). Seasonally-adjusted moving 3-month average; index: 1980 Q3=100

change





Sources: Association of Local Authorities, Federation of County Councils, Statistics Sweden and the Riksbank

Table 2.

Sectorwise wage formation. Annual percentage change

| | Outcome 1995 | 1996 | 1997 | 1998* | 1999* (JanFeb.) |
|--------------------|-----------------|------|------|-------|--------------------|
| Private sector | 4.2 | 6.3 | 4.3 | 3.8 | 3.2 |
| manufacturing | 4.8 | 7.5 | 4.5 | 3.9 | 3.0 |
| trade | 3.9 | 5.2 | 4.3 | 3.7 | 2.7 |
| construction | 4.1 | 4.0 | 3.0 | 3.2 | 5.0 |
| Public sector | 2.1 | 6.3 | 4.7 | 2.0 | ** |
| central government | 3.9 | 7.0 | 4.1 | 1.3 | 4.2 |
| municipalities | 1.0 | 5.3 | 4.4 | 2.2 | ** |
| county councils | 2.7 | 7.8 | 6.0 | 2.4 | ** |
| Total economy | 3.3 | 6.3 | 4.4 | 3.1 | ** |

Note. The figures include retroactive wage payments but do not mirror inter-sector reassignments of activities. * Preliminary. ** Statistics Sweden has taken over the wage statistics for municipalities and county councils; outturn data for 1999 are not yet available.

Sources: Association of Local Authorities, Federation of County Councils, Statistics Sweden and the Riksbank.

Figure 33.

Unit labour costs (ULC) and labour productivity. Moving 4-quarter average; percentage 12-month change







Figure 34. Productivity: total economy and manufacturing. Annual percentage change

Source: Statistics Sweden.

Figure 35.

Output gap calculated with three alternatives: Whittaker-Henderson filter (WH), Unobserved Component method (UC) and production function approach (PF). Per cent



Note. The WH filter is based on a projection of GDP, using the Riksbank's forecast for 1999-2000. Source: The Riksbank.





Sources: Statistics Sweden and National Institute of Economic Research.



Implied forward interest rates. Effective annual rate, per cent

Figure 37.

Source: The Riksbank.

Figure 38.

Implied forward interest rates: United States and Germany. Effective annual rate, per cent





Figure 39.

Forward 10-year interest rate differential with Germany and SEK/DEM exchange rate Weekly quotations; percentage points and SEK/DEM









Source: The Riksbank.



Note. Implicit inflation expectations are derived from the difference between implied 5–15-year real and nominal bond rates.

5-year expectations (Aragon survey)

Sources: Aragon Fondkommission and the Riksbank.

Implicit expectations



Figure 41.

Per cent

Inflation expectations.

CPI and inflation expectations of households and manufacturers. Percentage 12-month change



Note. The curves for expectations have been shifted twelve months into the future so that they coincide with the period to which the expectations refer. As of 1996, households' ten most extreme responses at either end are excluded; prior to 1996 the curve shows these responses in the range 0-15 per cent. The horizontal lines from 1995 onwards represent the Riksbank's tolerance interval for the annual change in the CPL

Sources: National Institute of Economic Research and Statistics Sweden.



Figure 43. Bond investors' expectations of inflation two and five years ahead. Per cent

> Note. The implicit expected average inflation rate in the period from three to five years ahead has been calculated by the Riksbank. The horizontal lines from 1995 onwards represent the Riksbank's tolerance limits for the annual change in the CPI.

Sources: Aragon Fondkommission and the Riksbank.

Figure 44.

Money market agents' inflation expectations. Per cent



Note. *From Statistics Sweden (otherwise Prospera). Sources: Prospera Research AB and Statistics Sweden.

Figure 45.

Average of CPI forecasts from selected forecasters. Annual percentage change



Note. The time axis denotes the date of the forecast. The observations are unweighted averages of forecasts published by FöreningsSparbanken, Handelsbanken, Merita-Nordbanken, SEB, Unibank,

Aragon, Hagströmer & Qviberg, Matteus Fondkommission, Ministry of Finance, National Institute of Economic Research, Swedish Post, Confederation of Professional Employees, Trade Union Confederation, and Wholesale & Resale Research Institute.

Sources: Those named in the note, Statistics Sweden and the Riksbank.



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

Sources: Statistics Sweden and the Riksbank.



Percentage 12-month change

Figure 47. UND1X with uncertainty intervals. Percentage 12-month change



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

Sources: Statistics Sweden and the Riksbank.

| Table 3. | | CPI<1 | 1 <cpi<2< th=""><th>2<cpi<3< th=""><th>CPI>3</th><th>Total</th></cpi<3<></th></cpi<2<> | 2 <cpi<3< th=""><th>CPI>3</th><th>Total</th></cpi<3<> | CPI>3 | Total |
|--|------------------|-------|---|--|-------|-------|
| CPI inflation. Percentage probability 12- | 2000 (June–June) | 50 | 40 | 9 | 1 | 100 |
| month figures | 2001 (June–June) | 33 | 30 | 23 | 14 | 100 |

Note. The figures show the probability of CPI inflation being in the column's interval. Source: The Riksbank.

| Table 4. | | UND1X<1 | 1 <und1x<2< th=""><th>2<und1x<3< th=""><th>UND1X>3</th><th>Total</th></und1x<3<></th></und1x<2<> | 2 <und1x<3< th=""><th>UND1X>3</th><th>Total</th></und1x<3<> | UND1X>3 | Total |
|--|------------------|---------|---|--|---------|-------|
| UND1X inflation. Percentage probability | 2000 (June–June) | 9 | 46 | 39 | 6 | 100 |
| releentage probability | 2001 (June–June) | 21 | 30 | 29 | 20 | 100 |

Note. The figures show the probability of UND1X inflation being in the column's interval. Source: The Riksbank.

Figure 48. Forecasts for CPI-inflation. Percentage 12-month change



Note. The main scenario in the five latest Inflation Reports, June 1998 to June 1999. Sources: Statistics Sweden and the Riksbank.

Figure 49. Forecasts for underlying inflation. Percentage 12-month change



Note. The main scenario for UND1 in the Inflation Reports from June 1998 and September 1998 and for UND1X thereafter.

Sources: Statistics Sweden and the Riksbank.