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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.

This Inflation Report reproduces the main features of the presentations and discussions of inflation at the Executive Board meetings on 5 and 10 October 2001.

The assessment of inflation presented here is the Riksbank's overall appraisal of inflation prospects in the current situation. Assessing the present situation is unusually difficult. The normal problems with determining when activity is likely to turn upwards after stocks have been adjusted, investment has adapted to more realistic expectations and so on, are now compounded by the difficulties in appraising the effects of the terrorist attacks in the United States and the ensuing reactions.

The Report constitutes the background to the Bank's monetary policy decision on 15 October 2001. Executive Board members may differ in their opinions about how inflation's main determinants will develop and the resultant impact on future inflation. Any divergent opinions of inflation prospects are recorded in the separate minutes of the Board meeting on 15 October, to be published on 30 October 2001.

The Riksbank Act (1988:1385, Chapter 6, Article 4) requires the Riksbank to hand over a written monetary policy report to the Parliamentary Standing Committee on Finance at least twice a year. The Riksbank has chosen to use the Inflation Report for this purpose.

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

This Report presents the Riksbank's appraisal of inflation prospects up to the end of 2003 Q3. The basis for comparisons is the preceding Report, compiled in May. Since then there have been three monetary policy meetings, at which the Riksbank's appraisal of inflation has gradually changed. Compared with the appraisal in September, when the repo rate was lowered 0.5 percentage points, the revisions to the picture of inflation are relatively limited. In order to clarify the consequences for monetary policy, the analysis starts from the technical assumption that the repo rate is unchanged.

Chapter 1 presents the Riksbank's summary assessment of inflation prospects. Chapter 2 contains a discussion of the most probable development of inflation's principal determinants. The assessment of the risk spectrum in inflation prospects follows in Chapter 3. The report also contains a number of boxed texts, the purpose of which is to provide additional knowledge about matters of importance for inflation assessments and the formation of monetary policy.

Stockholm, October 2001 Urban Bäckström Governor of Sveriges Riksbank

Inflation assessment

The assessment of inflation prospects up to the end of 2003 Q3 is summarised in this chapter, given the technical assumption that the repo rate is held unchanged at 3.75 per cent. Recent developments are presented first, followed by an account of the main features of the scenario for the coming two years that is considered most probable. The chapter ends with a summary assessment of the spectrum of risks in inflation prospects.

Summary

There has been some increase in inflation since the previous Report in May. It has come from the underlying domestic component (Figs. 1 and 2), while imported inflation has been almost 1 percentage point lower than expected, almost entirely due to the lower price of petrol.

With the synchronous economic slowdown in the United States, Japan and Europe, demand in the rest of the world is slackening this year and next to a considerably greater extent than foreseen in May. The weak situation is partly due to an adjustment of saving imbalances as well as profit expectations. The terrorist attacks in the United States occurred in a cyclical situation that was already uncertain and weak, with the prospect of the aftermath of the attacks having an exacerbating effect, at least in the short run. However, an upturn is foreseen in the second half of next year, more or less in accordance with the normal cyclical pattern. The expansionary economic policy contributes to this. A number of central banks have lowered instrumental rates and real interest rates have fallen appreciably. Fiscal policy has become notably expansionary in many countries.

Even so, price impulses from abroad in the coming years will be lower in Sweden on account of generally more subdued international resource utilisation. This applies even though the path of the exchange rate is judged to be weaker than envisaged in the May Report.

Domestic resource utilisation will also be lower, though it is judged to move up during the forecast period. It is mainly an expansionary economic policy (with tax cuts, for example), low interest rates and a weaker exchange rate that contributes to a recovery during 2002 that is distinct, even compared with other countries. The improved growth prospects stem in the first place from a favourable development of disposable income that underpins a stable increase in household consumption; the weaker exchange rate and its effect on net exports also contributes.

Inflation's domestic component will be somewhat higher than assumed earlier in the short run, mainly due to price increases for goods and services that are not judged to have a permanent

Figure 1. Indices of inflation. Percentage 12-month change



Note. UND1X is the CPI excluding house mortgage interest expenditure, and direct effects of changes in indirect taxes and subsidies; UNDINHX also excludes total price changes for goods that are mainly imported. UNDIMPX measures price changes for goods that are mainly imported excluding direct effects of changes in indirect taxes and subsidies.

Sources: Statistics Sweden and the Riksbank.

Figure 2. UNDINHX with and without food, electricity and telecom products. Percentage 12-month change



 Meat, electricity, telecom, Swedis fruit and vegetables (17%)

Sources: Statistics Sweden and the Riksbank



Figure 3. The Swedish krona's TCW exchange rate. Index: 18 November 1992=100 effect on inflation. Further on, inflation approximately follows the earlier forecast. Features of this assessment include effects of lower capacity utilisation and more subdued profit expectations on the one hand and, on the other, signs of somewhat higher inflation expectations and the possibility of some worsening of the relationship between inflation and growth in a wide sense.

The uncertainty about future inflation is even greater than at the time of the May Report. In a way, that is natural in the cyclical phase that now seems to prevail. Signs of a further slowdown are still coming in and it is difficult to tell when the downward phase, which to date has stemmed to a high degree from investment, will bottom out. At the same time, monetary and fiscal policy are both strongly expansionary, which should contribute to an upturn in the course of next year. An additional factor is the increased uncertainty in the wake of the terrorist attacks.

The risk spectrum is considered to be balanced, in keeping with the previous Report. Even after the downward revisions in the main scenario, the downside risk associated with a weaker international trend is considerable. It is countered by the risk of a less favourable relationship between growth and inflation. Another upside risk for inflation is the notably weak exchange rate; there are grounds for this assessment even though a persistently weak krona is the most probable alternative when economic activity is weak and inflationary impulses from resource utilisation are consequently lower. With the risk spectrum taken into account, the rates of UND1X inflation one and two years ahead are judged to be 1.7 and 2.0 per cent, respectively.

Developments since the May Report

Shortly after the May Report had been published the Swedish krona depreciated markedly from a level that was already low (Fig. 3). That accentuated the risk of the krona not strengthening to the calculated extent. The combined effect of relatively high resource utilisation, unexpectedly rapid price increases and greater uncertainty about the krona's future path was considered to constitute an increased risk of rising inflation expectations. Against this background, in mid June the Riksbank decided to intervene in the currency market.

At the monetary policy meeting on 5 July the risk of the inflation target being exceeded still existed, for the same reasons as at the time of the interventions. Resource utilisation was judged to be high, notwithstanding the ongoing slowdown, and there were no grounds for being more optimistic about the krona's future path. Moreover, although the substantial price increases in recent months were considered to be mainly transitory, there was a risk of them influencing inflation expectations. There were signs of slackening growth in the euro area and Japan but it was judged that towards the end of the year, developments in the United States would result in a gradual recovery that would spread

to other countries. The Riksbank decided to raise the repo rate from 4 to 4.25 per cent.¹

Inflation expectations, which according to some measurements had tended to move up in the late spring, returned in the summer to a level in line with the inflation target. The exchange rate stabilised.

The monetary policy meeting on 23 August judged that the rate of inflation two years ahead would be approximately 2 per cent. Against this background the repo rate was left unchanged. It was considered that demand had continued to weaken, both in Sweden and internationally, which should reduce the risks associated with imported inflation.

In connection with increasing signs in August of a more marked economic slowdown in the rest of the world as well as in Sweden, share prices started falling again. The krona, which had appreciated in July, began to weaken once more.

Early in the autumn the picture of an international economic slowdown became even more accentuated. A number of indicators pointed to a worsening of demand in the United States even before the terrorist attacks on 11 September. The uncertainty stemming from the attacks was liable to subdue demand in the rest of the world even more. After the U.S. Federal Reserve and other central banks had cut their instrumental rates on 17 September, on the same day the Riksbank chose to lower the repo rate 0.5 percentage points. An increased risk was perceived of inflation two years ahead being below the target, mainly because business and household confidence in the future might weaken and lead to a slowdown that was deeper and more protracted.

The terrorist attacks led to great uncertainty in the financial markets. As at the time of the international financial crisis in the autumn of 1998, the Swedish krona weakened along with the Australian and the New Zealand dollar, for example, share prices dropped and the yield curve became steeper. Recently, however, the krona has become somewhat stronger as the markets have stabilised.

The increase in both CPI and UND1X inflation since May has been somewhat greater than expected (Fig. 1). It is underlying domestic inflation (UNDINHX) that has been higher. Prices have gone on rising for meat, vegetables and electricity, for example (Fig. 2). Even excluding these items, domestic inflation has become somewhat higher than was expected. On the other hand, imported inflation (UNDIMPX) has been about 1 percentage point lower than expected, almost entirely due to movements in the price of petrol.

¹ See the minutes of the meeting, published on 26 July.







EXCHANGE RATE PASS-THROUGH

In the period since the move to a flexible exchange rate regime, the value of the Swedish krona has fluctuated markedly and in much of this period it has been low. Even so, the rate of price increases has been low and inflation expectations have been firmly anchored around the target.

Consumer prices for manufactured imports have been comparatively stable ever since 1990 (Fig. B1). There does not seem to be any clear relationship with the exchange rate. On the other hand, producer prices for manufactured products follow the exchange rate relatively closely.

An important question is how soon and to what extent an exchange rate movement shows up in prices. Another, considerably more difficult question is whether this pass-through has changed after the move to a flexible exchange rate. It is not just in Sweden that this question has been raised. Other countries, for example the United Kingdom, Finland, Canada, Brazil, New Zealand and Australia, also experienced a considerable depreciation of the exchange rate in the 1990s without consumer prices being affected as much as expected. A number of studies also provide some support for the notion of a decreased exchange rate pass-through in recent years.

The exchange rate affects inflation through a number of channels. The direct effect comes from import prices. The exchange rate also influences resource utilisation and inflation expectations, with an indirect impact on the rate of price increases.

ESTIMATIONS AT DIFFERENT STAGES

The pass-through from exchange rate movements is studied here with respect to producer and consumer prices. The direct pass-through to consumer prices is analysed first, then the exchange rate's pass-through to producer prices and the pass-through from there to consumer prices. Some general conclusions are then presented.

1. The direct pass-through to consumer prices

The exchange rate pass-through to consumer prices for manufactured products can be estimated directly. As indicated in Fig. B2, in such an estimation it is reasonable to include a measurement of domestic resource utilisation, for instance corporate sector unit labour costs. The results indicate that in year 1, approximately 17 per cent of a change in the exchange rate shows up in consumer prices. Statistical tests do not support the occurrence a structural break in the relationship.²

2. Pass-through to producer prices

In the case of producer prices, the pass-through from the exchange rate and international export prices is larger because domestic costs for processing, storage, distribution and marketing contribute less than they do to consumer prices. About 40 per cent of an exchange rate movement shows up in producer prices in the short run and almost 80 per cent in the long term (Fig. B3). Neither has the relationship appear to have changed appreciably over time.

It follows that any change in the exchange rate passthrough to consumer prices is not a consequence of a decreased pass-through to import prices to producers.

3. Pass-through from producer to consumer prices

The next stage is an analysis of the pass-through from producer to consumer prices. The long-term effect of a change in producer prices has decreased from almost 70 per cent in the period 1981-92 to just over 55 per cent in the period since then; the change is statistically significant. The short-run effect has, however, been unchanged at around 12 per cent. At the same time, the importance of unit labour costs for consumer prices has risen from about 20 per cent to about 50 per cent.

CONCLUSIONS

An altered pass-through from the exchange rate to producer prices for imported goods could not be demonstrated. But the pass-through from producer to consumer prices does seem to have decreased. Although the measurement problems are considerable, this suggests that the exchange rate pass-through to consumer prices is now somewhat lower than in the period with a fixed exchange rate.

One explanation for the decreased pass-through may be the economic policy realignment. A comparison of the exchange rate pass-through in five countries (Sweden, New Zealand, Canada, the United Kingdom and Australia) that have adopted an inflation target with the situation in countries that also have a flexible exchange rate but do not target inflation explicitly (e.g. Germany, Norway, Switzerland and the United States) suggests that the pass-through can be affected by the

2 Estimations done on quarterly data from 1977- 2001 for producer prices and from 1980- 2001 for consumer prices. Figure B3. Effect on the level of import prices to producers from a transitory 1 per cent depreciation of the krona in 1990 Q2.



direction of economic policy.³ There are some indications that price fluctuations have decreased relatively more in the countries that target inflation and that this has helped to reduce the exchange rate pass-through.⁴

There are arguments to the effect that the economic policy realignment for low inflation can have reduced the exchange rate pass-through. Due to price rigidities, there is a time lag before firms pass on changes in marginal costs; if the changes are temporary, the pass-through will then be small when low inflation has been established. And as price setting is also dependent on expectations of competitors' behaviour, more stable inflation expectations make firms more hesitant about passing exchange rate effects on.⁵

Another argument in favour of a reduced passthrough is that increased exchange rate fluctuations may of themselves induce firms to adjust profit margins rather than prices.⁶ With a flexible exchange rate, exporters and importers may perceive upward and downward movements as relatively transitory, whereupon they may adjust their margins pending a return to what they regard as a more normal level. It is also conceivable that the international markets for goods and services are segmented, so that producers adjust their prices to the demand situation in each national market. A foreign firm would accordingly absorb a temporary dip in profits in Sweden, for example out of consideration for market share, dealers and customer relations.⁷ This phenomenon has been observed in Sweden, particularly in connection with the devaluations in the 1970s and 1980s.

Consumer prices for imported products may also have been restrained in the 1990s for other reasons. EU membership and the common market have probably contributed to price convergence for products in international trade. The Swedish price level's downward shift towards the EU average for such items as furniture, clothing and footwear may have countered the exchange rate pass-through. Another contributory factor may be the deregulations and changes in the structure of wholesale and retail trade. Moreover, the composition

- 4 Cf. the two boxes on pp. 17-24.
- 5 Taylor, J. (2000), Low inflation pass-through and pricing power of firms, *European Economic Review*, 44:7, pp. 1389- 1408.
- 6 Mann, C. (1986), Prices, profit margins and exchange rates, *Federal Reserve Bulletin*, 72, pp. 366-379.
- 7 Krugman, P. (1987), Pricing to market when the exchange rate changes, in Arndt, S.W. & Richardson, J.D., *Real-financial linkages among open economies*, MIT press.

³ Gagnon, J.E. & Ihrig, J. (2001), Monetary policy and exchange rate pass through, International Finance Discussion Paper, 704, Board of Governors of the Federal Reserve System, Washington, D.C.

of imports has changed markedly in recent years. Importers may have chosen to cope with a stronger euro and dollar by relying more on imports from other countries with currencies that have not appreciated as much against the krona.

A number of these factors that may have tended to reduce the exchange rate pass-through - for example price convergence, increased international competition and structural changes in wholesale and retail trade may be rather temporary. One cannot count on the exchange rate pass-through to consumer prices being stable in the future.

The main scenario

The economic downturn abroad has been more pronounced and protracted than foreseen at the time of the May Report. A synchronous global slowdown in manufacturing activity has worsened the outlook for profits, subdued investment and contributed to a further fall in share prices. In some respects – the stock adjustments, for example – the cyclical path is fairly typical but it is accentuated by the abrupt end to the overoptimism, not least in stock markets. To this should be added the continued crisis in Japan and the unrest generated by the terrorist attacks in the United States, which is assumed to lead to lower paths for consumption and investment.

International growth prospects have worsened.

International growth both this year and next is judged to be lower than assumed earlier. Effects of the terrorist attacks and the stock market fall are assumed to weaken consumption and investment propensities, particularly in the United States. Moreover, the events in the United States have led to a further worsening of growth prospects in Japan and the euro area, though the impact of the terrorist attacks on international growth is highly uncertain. A crucial factor in this context is security policy developments. Production and consumption in the United States are judged to be lower in the short run. Further ahead, reconstruction work in the United States and a more expansionary economic policy in most countries are expected to contribute to a recovery of global economic activity. All in all, growth in the OECD area is calculated to be 1.0 per cent this year and 1.5 per cent in 2002, which for both years is a downward revision of the earlier forecast by 1.0 percentage point (Table 1). Growth in 2003 is expected to reach 2.6 per cent, or somewhat less than foreseen in the May Report.

Table 1. GDP growth. Percentage annual change

	2001	2002	2003
United States	1.0 (1.9)	1.5 (2.7)	3.1 (3.2)
Euro 12	1.6 (2.4)	2.0 (2.7)	2.6 (2.8)
Japan	-1.2 (1.0)	-0.4 (1.7)	1.6 (2.0)
OECD 19	1.0 (2.0)	1.5 (2.5)	2.6 (2.8)

Note. The figures in parentheses are the revisions compared with the May Report.

Source: The Riksbank

International export prices in foreign currency have fallen since the May Report. In view of lower international capacity utilisation, it is foreseen that throughout the forecast period they will continue to be weaker than expected earlier.

The extent to which international price changes show up in Swedish inflation is partly connected with the path of the exchange rate, which has been weaker than expected. A major factor here in the first half of this year was presumably the sudden worsening of the situation for exports and poorer terms of trade. Moreover, extensive portfolio flows accompanied a stock market fall in Sweden that was more marked than elsewhere at the same time as the new pension funds were enabled to invest in foreign shares. When the krona then depreciated rapidly at the same time as inflation outcomes were surprisingly high, this affected inflation expectations. Recently the pattern has been somewhat different, with a depreciation that instead of being primarily a Swedish phenomenon, has its counterpart in other countries, Australia for example. It seems to be mainly connected with the general financial unrest; capital moves to countries whose currencies have a good historical record in turbulent times.

Fundamental considerations, for example conditions for growth and a surplus on the current account, favour an appreciation of the krona in the coming years. The prospects of stronger manufacturing activity and a stabilisation of stock markets point in the same direction. But mainly in view of the weak initial position, at the end of the forecast period the value of the krona will probably be lower than the Riksbank counted on in May. All in all, the krona's weaker path, together with lower real short- and long-term interest rates, contributes to more expansionary monetary conditions during the forecast period.

Mainly in view of the weak initial position, at the end of the forecast period the value of the krona will probably be lower than assumed earlier.

The international slowdown affects inflation in Sweden via its impact on total demand, for example. Both exports and imports this year have been appreciably slacker than expected. The more subdued development of exports, despite the weak exchange rate, has to do with, for example, the product mix and market conditions in some key sectors. A gradual improvement in export market growth is foreseen in the forecast period; together with favourable relative prices, in the years ahead this is expected to generate increasingly high export growth, though with a largely unchanged market share. One of the assumptions here is that the negative effects of structural changes in telecom production, for example, will come to an end in the year ahead. Import growth is also judged to pick up in the forecast period in connection with rising domestic demand. All in all, the positive contribution to GDP growth from net exports in the coming years is expected to be somewhat larger than foreseen in the May Report, mainly as a result of the weaker exchange rate.

On the other hand, weaker domestic demand than foreseen in the May Report is expected mainly this year but also in the rest of the forecast period. This is largely due to a more subdued development of both household consumption and fixed gross capital formation. The continued stock market fall and increased pessimism about the future have dampened consumption but a recovery is foreseen in connection with a stabilisation of wealth and, above all, rising disposable income as a result of, for Figure 4. Inflation Report forecasts of supply and demand in 2002.



example, an expansionary fiscal policy and persistently high employment. Even with the increase in consumption, households' financial saving rises markedly from 2000 to 2003. Another feature of the picture is an annual growth rate of about 1 per cent for public consumption.

The weaker situation in manufacturing, with lower capacity utilisation, a weaker profit trend and falling share prices, motivates some downward revision of fixed gross investment throughout the forecast period.

GDP growth is judged to be lower, particularly this year, than expected earlier.

All in all, in the main scenario this year's GDP growth rate is now judged to be 1.3 per cent or almost one percentage point lower than foreseen in May. Growth rates of 2.2 and 2.8 per cent are foreseen for 2002 and 2003, respectively, which is also somewhat lower than forecast earlier (Fig. 4). A basic tenet behind the main scenario is that the more expansionary realignment of economic policy in a number of countries does in fact lead to a successive recovery in Sweden as well as in the rest of the world. Following the cut of 0.5 percentage points in September, the Riksbank's repo rate is 0.25 percentage points lower than at the time of the May Report. The exchange rate is also tending to stimulate the economy. Moreover, it looks as though fiscal policy will be more expansionary than assumed earlier.⁸

Resource utilisation is judged to be lower throughout the forecast period.

With the weaker GDP growth, total resource utilisation in the Swedish economy is likely to decline this year. However, the unutilised resources will be brought into production successively during the latter part of 2002 and 2003, so that the total input of resources at the end of the forecast period approximately matches potential production capacity. But compared with the May forecast, resource utilisation is expected to be lower throughout the forecast period and this tends to subdue inflationary pressure's domestic component.

The rate of wage increases to date this year has been slower than expected. At the end of the year, however, the disbursement of retroactive wage increases will lead to a somewhat higher rate but this is still expected to be lower than assumed earlier. With a weaker labour market, next year's wage rise is likewise judged to be slower than forecast earlier. All in all, the annual rate of wage increases in the forecast period as a whole would then average between 3.5 and 4 per cent. The extent to which this can be combined with low inflationary pressure hinges in part on the development of productivity. With some downward revision of productivity growth throughout the forecast period, unit labour costs in the coming years would be marginally higher than forecast in May.

8 To some extent this reflects the additional measures that have been proposed, for instance tax cuts for pensioners. But it mainly has to do with new calculations showing that both the tax cuts and the transfers to households will be larger than assumed earlier.

Imported inflation one year ahead is judged to be approximately as forecast previously. This reflects the assessment that effects of the weaker exchange rate will be largely countered by a slower increase in international export prices, lower oil prices and lower resource utilisation. Two years ahead, however, import prices are judged to rise more slowly than assumed earlier, mainly due to weaker price impulses from the rest of the world and an appreciation of the krona that is somewhat more rapid than forecast earlier, albeit from a lower level (Fig. 5).

Even with lower resource utilisation this year, in the coming half-year inflation generated in Sweden is judged to be higher than forecast in May, mainly on account of further price increases, for example for electricity. This is followed by the prospect of domestic inflation falling back successively as the earlier price increases for food, electricity and telecom, for example, drop out of the 12-month change figures. Two years ahead, domestic inflation is judged to be broadly the same as forecast earlier (Fig. 6). The close relationship between costs and prices means that unit labour costs can be used as an alternative indicator of underlying inflationary pressure, particularly when no sizeable change is foreseen in profit margins. The path of unit labour costs is approximately the same as assumed earlier: the rate of wage increases has been revised downwards by approximately as much as productivity.

The fact that in spite of weaker economic growth, the increase in domestic inflation in the past six months has been appreciably greater than forecast earlier raises questions about the relationship between growth and inflation in a wide sense. While it is true that a large part of inflation's increase can be attributed to more transitory price increases - for certain food products and electricity for example - even when these items are excluded the rate of domestic inflation has been high. This could indicate that resource utilisation has been somewhat higher than assumed earlier but that is gainsaid by other factors, for example the low wage outcomes. But in view of the higher inflation figures, in the coming two years it is judged that inflation will be marginally higher than indicated by the relationships with resource utilisation that have been used earlier.

Both CPI and UND1X inflation two years ahead are judged to be in line with the targeted rate.

In view of the high outcomes recently, it is assumed that in the short run, both CPI and UND1X inflation will be higher than envisaged earlier. At the end of the forecast period, on the other hand, inflation is likely to be lower than foreseen in May, mainly on account of weaker price impulses from the rest of the world but also to some extent because the lower resource utilisation points to smaller profit margins (Fig. 7). In the main scenario with an unchanged repo rate, CPI inflation is judged to be 1.5 per cent one year ahead and 2.1 per cent after two years. The corresponding forecasts for UND1X inflation are 1.7 and 2.0 per cent (Table 2).

Figure 5. UNDIMPX with and without certain items. Outcome and main scenario.



 UNDIMPX excl. petrol, heating oil and imported fruit and vegetables (83%)
Petrol, heating oil and imported fruit and vegetables

(17%)

Sources: Statistics Sweden and the Riksbank

Figure 6. UNDINHX with and without specified items. Outcome and main scenario. Percentage 12-month change



UNDINHX excl. meat, electricity, telecom, fruit and vegetables Meat, electricity, telecom, fruit and vegetables

Sources: Statistics Sweden and the Riksbank.

Figure 7. CPI and UND1X. Outcome and main scenario.



Sources: Statistics Sweden and the Riksbank.

In recent years the Riksbank has chosen to base monetary policy on inflation measured by UND1X, that is, on an index that excludes changes in interest expenditure, indirect taxes and subsidies. There are no strong reasons at present for changing this. This speaks in favour of basing monetary policy on an assessment of UND1X inflation.

Table 2. Inflation forecasts in the main scenario. Per cent

	Ar	inual rate	12-m	onth rate
	2001	2002	Sept. 2002	Sept. 2003
CPI	2.6 (2.5)	2.0 (2.1)	1.5 (2.1)	2.1
UND1X	2.8 (2.5)	2.4 (2.1)	1.7 (2.1)	2.0
UNDINHX	3.8 (3.2)	3.2 (2.9)	2.5 (2.7)	2.7

Note. The figures in parentheses are the forecasts in the May Report.

Source: The Riksbank.

PRICE SETTING BY SWEDISH FIRMS

The pricing behaviour of firms is a central issue for an understanding of monetary policy's impact on inflation, as well as of how different types of unexpected event affect the price level. Relatively little is known, however, about the process of price adjustment by firms.⁹ In order to add to knowledge of price formation in Sweden, the Riksbank has arranged for a survey of the pricing behaviour of Swedish firms. The survey was done in spring 2000 and more than 600 firms completed the questionnaire, giving a response rate of almost 50 per cent. Some of the results are presented here.¹⁰

HOW RIGID ARE PRICES?

The first question in the study concerns the extent to which firms set their product prices independently. More than 90 per cent of the responders stated that " the firm is in a position to set its own prices" as opposed to the alternative: " the price is set entirely by the parent company/group or in another way outside their subsidiaries".

The frequency of price changes was reported, in keeping with earlier studies, to be relatively low. About 40 per cent stated that they usually changed the price of their primary product once a year, while about 27 per cent did so more seldom. It is conceivable that the frequency of price adjustments is influenced by the current rate of inflation. At the time of the survey the rate of inflation in annual terms was little more than 1 per cent.

WHEN ARE PRICES CHANGED?

According to economic theory, there are two main explanations for the occurrence of price adjustments. A firm that adjusts prices at given intervals can be said to follow a time-dependent rule. One such rule may be to have price adjustment routines that save costs while ensuring a price-setting behaviour that customers find predictable. When adjustments relate to the economic situation, the price is changed only when the gains from doing so exceed the costs, a state-dependent rule.¹¹ With

⁹ For a review of the field see Taylor J.B. (1999), Slaggered price and wage setting in macroeconomics, in Taylor, J.B. & Woodford, M. (eds.) Handbook of macroeconomics, Elsevier, Amsterdam, pp. 1009-1050.

¹⁰ A complete account of the survey, which was carried out by Statistics Sweden between March and May 2000, will be published in the Riksbank's Working Paper series.

¹¹ Barro, R. (1972), A theory of monopolistic price adjustment, Review of Economic Studies 34, pp. 17-26.

the latter model, prices are adjusted as soon as something happens that is sufficiently important to motivate this. If firms adjust prices at predetermined intervals, on the other hand, the change will not occur until the interval has elapsed.

In the survey, approximately 23 per cent of the responders adjusted prices at predetermined intervals, 28 per cent did so when the economic situation changed and about 20 per cent reviewed the price on a daily basis or even more frequently. Just under 22 per cent stated that they normally followed a time-dependent rule but could switch to a situational rule if this was called for. So, about 45 per cent of the responders stated that under normal conditions they followed a time-dependent rule. If something important happens, however, most firms are prompted to adjust prices (Table B1). The state-dependent rule then predominates. The circumstance that firms depart from a time-dependent review in the event of a major change is not surprising but has not been documented before.

Table B1. Rules for price review. Per cent of firms

Pricing rule	Normal situation	Large shocks
Time-dependent	44.8	23.1
State-dependent	47.2	68.9

The Riksbank's study also suggests that the importance of the economic situation for the pricing behaviour of firms is greater than earlier studies have shown. A conceivable explanation might be that the low level of inflation at the time of the survey was considered to reduce the need for time-dependent price adjustments.

REASONS FOR THE CHOSEN INTERVAL

Of the firms that reviewed prices at a predetermined interval, a majority (66 per cent) normally did so once a year. The second most common interval, once a quarter, was reported by about 15 per cent. The firms were also asked to rank reasons for choosing an interval for a price review (Table B2).

Table B2. Importance of reasons for a chosen interval

Reason	Average
The price could not be changed more frequently without upsetting customer relations	3.48
Factors affecting the price do not change more frequently	3.03
Costs for preparing and discussing price adjustments	1.97
Interval decided by parent company or government authority	1.70

Note. The firms had five alternatives to choose from (from Fully agree, 5, to No answer/not relevant, 1); the latter was excluded from the calculation of average figures.

A reluctance to upset customer relations and the frequency of unexpected events were the two most important explanations for the choice of interval. It is hardly surprising that firms did not want to upset customers – around 60 per cent stated that regular customers accounted for 90 per cent or more of their sales. Another factor in favour of price adjustments not being all that frequent is the widespread use of written contracts that run for a year and regulate the price for their duration.

The firms stating that they reviewed prices once a year were also asked to indicate the month in which this was usually done. The most usual procedure appeared to be a price review around the turn of the year; about 45 per cent cited January or December, while 16 and 11 per cent, respectively, made their review in October and November. The remaining months had roughly equal proportions, apart from July, when no firm reviewed prices.

These results are in good agreement with price changes as recorded in the consumer price index: the largest changes usually occur in January and September (Fig. B4).

WHY ARE PRICES CHANGED?

Reasons for actually changing the price were also ranked (Table B3). The results are well in line with economic theory. Firms gave the highest rankings to changes that affect demand or marginal costs. Changes in the consumer price index and the exchange rate are important above all in relation to costs and demand. It seems, for example, that for pricing, the importance of changes in costs for imported intermediate goods is relatively large. This is noteworthy in that by no means all firms use imported intermediate goods; for those that do so, the development of these costs thus appears to be highly significant. But although international prices and the exchange rate are important for producer price-setting, the possibility or need of passing prices on to consumers seems to have decreased.¹²





Table B3. Importance of reasons for price changes

Reason	Average ranking
Changes in competitors' prices	3.27
Altered costs for imported intermediate goods	3.05
Requests from important customers	3.04
Changes in product demand	3.01
Altered costs for domestic intermediate goods	3.00
Changes in taxes and charges	2.98
Changes in capital costs	2.76
Directives from parent company/authorities, etc.	2.38
Exchange rate movements	2.24
Changes in wage costs	2.11
Sales campaigns	2.02
Changes in consumer price index	1.89
Routine price write-up at regular intervals	1.52

Note. The firms had five alternatives to choose from (from Highly important, 5, to No answer/ not relevant, 1); the latter was excluded from the calculation of average figures.

Another point worth noting is the relatively low ranking of wage costs; this may be because wages are changed infrequently. Wage settlement periods have become longer in the most recent negotiating rounds. The highest ranking was given to changes in competitors' prices. One of the background questions was about how many competitors the firm had: almost 5 per cent reported having no competitors at all and 27 per cent at least 12 competitors. It follows that about two-thirds of the firms considered they have 1-11 competitors, which suggests that many firms operate in an oligopoly. Thus, it is hardly surprising that changes in competitors' prices are important for pricing behaviour.

SUMMARY

The study of the pricing behaviour of Swedish firms is a part of the Riksbank's endeavour to arrive at a better understanding of pricing behaviour. The intention is to follow-up this survey so as to be able to analyse whether and, if so, how price-setting behaviour changes over time. The responses to the survey show that price are adjusted relatively infrequently; the median is once a year. At the same time, price adjustments in the light of new economic information are at least as common as regular time-dependent adjustments. This conclusion is important in that it facilitates assessments of how prices are liable to move in connection with sizeable economic changes, such as large exchange rate movements, oil price shocks and major changes in taxation.

Among the firms that review prices at regular intervals, the most common frequency is once a year. The price review occurs most often around the turn of the year. One of the reasons for not adjusting prices more frequently is that this would be liable to upset customer relations. An explanation for this could be that a large proportion of firms have regular customers.

All in all, the results indicate that prices in Sweden can be expected to be relatively rigid, which agrees with the findings presented in the box on pp. 22-24. However, if conditions for price formation were to change appreciably, for example on account of a marked depreciation of the krona or a pronounced fiscal policy realignment, prices can be adjusted relatively quickly.

Asked about the importance of various factors for price setting, the firms attached most importance to changes in competitors' prices, while changes in wages, the consumer price index and the exchange rate were relatively less important.

HAS PRICE FLEXIBILITY CHANGED?

During the 1990s, growth in many industrialised countries was unusually high and inflation unusually low. This has been taken to indicate that the relationship between demand and inflation changed.¹³ In that monetary policy's impact on inflation is channelled to a high degree through the effect of interest rates on demand, such a change may be relevant for the formation of monetary policy.

In the past decade the average rate of inflation in the OECD area moved down by around five percentage points and is currently about two per cent. To a large extent this was a consequence of price stability being enshrined as one of economic policy's primary objectives. Economic models incorporating nominal rigidities show that a lower rate of inflation normally leads to an increased degree of price rigidity. Under such circumstances, moreover, the duration of contracts may become longer because there is less need or reason for firms to adjust prices.¹⁴ It is therefore reasonable to suppose that in the past decade price flexibility has decreased. This hypothesis is studied here by calculating the time it takes for prices to adapt to a nominal change. Decreased price flexibility means that nominal changes have larger short-run effects on the real economy.

The nominal change can be decomposed into a price and a quantity component. The method also makes it possible to investigate whether or not the degree of price flexibility has changed in the past decade. The calculations follow Gordon (1981).¹⁵ The estimated equation is:

$$\Delta \pi_{\tau} = \alpha_0 + \sum_{i=0}^{N} \alpha_i \Delta \hat{y}_{t-i} + \varepsilon_t ,$$

where α_0 is a constant, $\Delta y_{i,i}$ is the nominal shock, defined as the difference between the nominal and the potential GDP growth rate, ε_i is a random term and α_i represents the extent to which the shock affects inflation. By including a number (n=8) of lagged nominal shocks, the equation also measures the time required for complete price adjustment. From the definition of the nominal shock it follows that the output gap is

¹³ See Inflation Report 1999:3, box on pp. 52-55.

¹⁴ Cf. also the box on pp. 17-21 in this issue.

¹⁵ Gordon, R.J. (1981), Output fluctuations and gradual price adjustment, J. of Economic Literature, 19, pp. 493- 530.

 $(1-\sum_{i=0}^{N} \alpha_i) \Delta \hat{y}$. In the long run the output gap is zero, which in the equation above implies that $\sum_{i=0}^{N} \alpha_i = 1$, which corresponds to a vertical Phillips curve. Potential GDP is estimated with the HP filter technique.

EMPIRICAL RESULTS

The study comprised the following countries: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Japan, the Netherlands, Portugal, Spain, Sweden, the United Kingdom and the United States in the periods 1963-89 and 1990-99. The results of a calculation that includes all these countries are shown in Table B4.

Table B4. Price adjustment coefficients

Period	Adjustment after 1 year	Accumulated adjustment after 2 years
1963–89	0.87 (0.03)	1.00 (0.02)
1990–99	0.55 (0.05)	0.92 (0.04)

Note. The table shows the means for 17 countries (1=full price adjustment); the figures in parentheses are the standard error.

The table shows the proportion of the nominal changes that affects prices after one and two years, respectively. In the earlier period the adjustment after one year is 87 per cent as against only 55 per cent in the later period, a difference of 32 percentage points. It follows that in the earlier period the effect of the nominal change on real GDP (measured as the deviation from potential GDP) amounts to 13 per cent in the year one. After two years GDP has returned to its equilibrium level, which implies full adjustment. During the lowinflation regime, on the other hand, full adjustment has not been achieved after two years; about 92 per cent of the shock has shown up in higher prices, leaving 8 per cent as a continued effect on the real economy. A statistical test rejects the hypothesis that the degree of price adjustment, measured in this way, after one year is the same in both periods.

Corresponding calculations were made for individual countries. The results showed that, measured in this way, prices in most countries have become more rigid but that countries differ both in the degree of price flexibility and in the extent to which this has changed between the two periods. In most cases the difference between the periods is statistically significant.

RELATIONSHIP BETWEEN PRICE FLEXIBILITY AND INFLATION

The calculations suggest that the change from high to low inflation has decreased the degree of price flexibility. In order to bring out the link between the degree of price flexibility and inflation, a calculation was done where the degree of price flexibility in each country and period is dependent on the rate of inflation in the same country and period. The results indicate that a one percentage point reduction in the rate of inflation curtails the degree of price adjustment in year 1 by about five percentage points. In other words, lowering the rate of inflation by five percentage points would retard the price adjustment in year 1 by around 25 percentage points, that is, the price adjustment after a nominal shock would be markedly more protracted.

CONCLUSIONS

The results suggest that prices have become more rigid. This may be due to more stable and lower inflation expectations on account of the monetary policy realignment. The lower inflation may have made longterm contracts more attractive and price adjustments less rewarding for the firm. Support for this is to be found, for example, in the study reported in the box on pp. 17-21 in this issue as well as in tendencies for the duration of labour market contracts to lengthen. The results of the study must be interpreted with great caution because one cannot tell for certain whether it really is just the lower inflation that lies behind the increased price rigidity.

The risk spectrum

In view of the inherent uncertainty in inflation forecasts, the risk spectrum is also relevant for the formation of monetary policy.

Although international economic growth has been revised downwards markedly in the main scenario, the downside risks are still considered to be substantial. The risk of a more protracted international slowdown is judged to be greater than at the time of the May Report. A rapid adjustment of the saving imbalances in the United States, combined with a further fall in Japanese demand, continued uncertainty about the security policy situation and a more subdued tendency in Europe, could lead to a concurrent and more protracted international slowdown. There would then be an attendant risk of weaker international export prices and thereby lower imported inflation in Sweden. All in all, the risks associated with international developments are judged to add up to a downside risk for inflation in Sweden that is somewhat larger than foreseen in the May Report.

Risks of inflation being higher than in the main scenario are also present. Inflation rose more than expected last spring, largely as a result of effects that seem to be mainly transitory. But even excluding these effects, the increase in underlying inflation was somewhat stronger than foreseen earlier. Since then, price increases for goods and services produced in Sweden have remained high. This has been accompanied by some upward shift in inflation expectations as measured from surveys. Against this background it is conceivable that resource utilisation has been somewhat underestimated or that for other reasons there is a risk of inflation being higher than calculated. Limited allowance has been made for this in the main scenario but it is still entirely possible that inflation will be even higher because its relationship with growth in a wide sense is less favourable than assumed earlier.

All in all, it is considered that the downside risk associated with international developments is balanced by the upside risks from the exchange rate and the relationship between growth and inflation.

Another upside risk for inflation lies in the exchange rate. Since the May Report the krona has become appreciably weaker. The main risk of the krona remaining weak admittedly lies in developments abroad and to that extent the risk is smaller in that the weak exchange rate is then accompanied by lower price pressure for cyclical reasons. But there is also a risk of the krona remaining weak even if international developments are in line with the main scenario. In such a scenario there is a risk of a weak exchange rate having more appreciable effects on inflation in Sweden.

All in all, it is considered that the downside risk associated with international developments is balanced by the upside risks from the exchange rate and the relationship between growth and inflation. Taking the risk spectrum into account and given an unchanged repo rate, UND1X inflation is judged to be somewhat below the targeted rate one year ahead and in line with the target after two years.

PROSPECTS BEYOND THE FORECAST HORIZON

Monetary policy is normally directed at fulfilling the inflation target one to two years ahead. However, policy also affects developments beyond this forecast horizon. A picture of inflation in a longer perspective is therefore sketched below.

In the main scenario, growth internationally as well as in Sweden recovers towards the end of the forecast period, not least as a result of an expansionary economic policy. During 2003 resource utilisation in Sweden is judged to be high but somewhat lower than forecast in the May Report. At the same time, the recovery after the weak performance this year and the early part of 2002 is expected to be somewhat quicker than assumed earlier. If developments follow this path, inflationary pressure will presumably become gradually stronger beyond the forecast horizon. A contributory factor here is that during 2004 wages will be negotiated for large groups in the labour market at a time when resource utilisation is liable to be high. The tendency will be accentuated if the present and planned easing of economic policy has stronger effects than have been allowed for.

But neither can a deeper and more protracted economic slowdown in the rest of the world be ruled out. Resource utilisation in Sweden might then be lower. That would presumably lead to lower inflationary pressure, though to some extent this would be countered by the krona appreciating less than in the main scenario.

FORECASTING INFLATION WITH A RISING REPO RATE

Market pricing and survey data of analysts' opinions indicate current expectations of a repo rate increase in the coming two years. The inflation forecasts of most external observers likewise incorporate repo rate increases. In the main scenario, however, inflation is forecast as usual on the technical assumption that the repo rate will be unchanged; this serves to bring out the consequences for the formation of monetary policy. An illustrative calculation is therefore presented here that incorporates repo rate increases in line with market expectations as reported in Statistics Sweden's survey in September 2001.

The survey data show expectations of a repo rate of 3.75 per cent three months from now, followed by increases to 4.0 per cent one year ahead and 4.5 per cent after two years.¹⁶ Here it is assumed that the shortterm market interest rates will broadly follow the repo rate, while the pass-through to the longer rates is smaller. Compared with the main scenario, the short rates are judged to be approximately one half of a percentage point higher, while the effect on long rates stops at between 5 and 10 basis points. The higher level of interest rates is also judged to strengthen the exchange rate to some extent.

Compared with the main scenario, a path for the repo rate that follows market expectations accordingly means that the combined effect on demand from interest rates and the exchange rate is judged to be somewhat less expansionary than in the main scenario.

The higher interest rates are judged to have some downward effect on the growth of both investment and household consumption. Moreover, the somewhat stronger exchange rate acts as a damper on net exports and import prices. All in all, this is judged to result in marginally lower GDP growth in both 2002 and 2003. Moreover, the more subdued economic activity leads to somewhat lower inflationary pressure (Table B5). Table B5. Modified inflation forecast, incorporating the interest rates expected in Statistics Sweden's survey in September 2001. Percentage change and percentage points

	Annual rate	Annual rate	12-month rate	12-month rate
	2001	2002	Sept. 2002	Sept. 2003
CPI	2.6 (0.0)	2.0 (0.0)	1.5 (0.0)	2.1 (0.0)
UND1X	2.8 (0.0)	2.3 (-0.1)	1.6 (-0.1)	1.9 (-0.1)

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

Source: The Riksbank.

The higher interest rates imply increased interest expenditure for households, with effects on the development of the consumer price index. This is countered by somewhat lower GDP growth. CPI inflation is therefore judged to match the picture in the main scenario both one and two years ahead, while UND1X inflation is about 0.1 percentage point lower at both time points. The impact is not larger than this because effects of monetary policy take time to materialise and the greater part of the expected increase in the repo rate occurs towards the end of the forecast period.

Determinants of inflation

The development of inflation's main determinants in the coming two years that the Riksbank finds most probable is presented in this chapter. International factors are considered first, followed by a review of the monetary conditions. Finally, economic developments in Sweden are discussed in detail.

External economic activity and inflation

Since the May Report the economic slowdown in the OECD area has become more pronounced. Forecast growth has been revised downwards for the United States and the euro area as well as for Japan. The terrorist attacks in the United States in September occurred in a precarious economic situation and are judged to have a negative effect on economic developments in the OECD in the forecast period. The outcome will depend in large measure on the future security policy situation and the economic policy response (see the box on pp. 34-37). A week or so after the attacks, a number of central banks - including the Federal Reserve and the ECB - had already lowered their instrumental rates 0.5 percentage points.

The global slowdown is deeper than expected.

Compared with the May Report, growth in the OECD area is now expected to be lower both this year and in the next two years, accompanied by lower export market growth and a weaker development of international export prices (Table 3). Export market growth has slackened more than normal relative to GDP growth. An explanation for this could be that a dominant feature of the cyclical slowdown is falling demand for investment, particularly in the telecom industry.

In May there was judged to be some risk of rising inflation, particularly this year, in both the United States and the euro area. This risk has decreased, above all in view of the weaker demand but also in that transitory price increases for energy and food are beginning to fade. Persistently low inflation expectations also point to inflation being lower next year.





Sources: U.S. Department of Commerce and Eurostat

Figure 9. Stock exchange indices. Index: 17 May 2001=100



Morgan Stanley emerging markets free index --- TOPIX (Japan)

Note. The vertical line is the cut-off date for the May Inflation Report. Since that time Wilshire 5000 has fallen almost 20 per cent and the European indices have also fallen dramatically, in the case of EMU Stoxx by 25 per cent.

Sources: Wilshire Associates and Hanson & Partners AB

Figure 10. USD/EUR exchange rate.



Source: Hanson & Partners AB.

Table 3. International conditions.

Percentage annual change or annual level

	GDP				CPI			
	2000	2001	2002	2003	2000	2001	2002	2003
U.S.A	4.1 (5.0)	1.0 (1.9)	1.5 (2.7)	3.1 (3.2)	3.4 (3.4)	3.0 (2.7)	2.0 (2.3)	2.2 (2.4)
Japan	1.5 (1.7)	-1.2 (1.0)	-0.4 (1.7)	1.6 (2.0)	-0.6 (-0.6)	-0.8 (-0.8)	-0.2 (-0.2)	0.5 (0.5)
Germany	3.1 (3.0)	0.9 (2.0)	1.8 (2.3)	2.3 (2.5)	2.1 (2.0)	2.6 (2.0)	1.3 (1.5)	1.6 (1.5)
France	3.4 (3.4)	1.9 (2.6)	2.0 (2.8)	2.5 (2.8)	1.8 (1.9)	1.7 (1.8)	1.4 (1.7)	1.7 (1.6)
United Kingdom	3.1 (3.0)	1.9 (2.5)	2.3 (2.5)	2.5 (2.6)	0.8 (2.1)	2.2 (2.1)	2.3 (2.4)	2.4 (2.4)
Italy	2.9 (2.9)	1.8 (2.3)	2.0 (2.5)	2.5 (2.6)	2.6 (2.5)	2.7 (2.3)	1.8 (1.9)	2.0 (2.0)
Denmark	2.3 (2.8)	1.4 (2.0)	1.9 (2.2)	2.2 (2.2)	2.7 (2.7)	2.3 (2.3)	1.9 (2.0)	2.1 (2.1)
Finland	5.7 (5.7)	1.8 (4.2)	2.5 (3.5)	2.7 (2.7)	3.0 (3.0)	2.7 (2.5)	1.8 (2.1)	2.2 (2.3)
Norway	2.2 (1.8)	1.2 (1.2)	1.6 (1.6)	1.8 (1.8)	3.1 (3.1)	3.2 (2.9)	2.0 (2.4)	2.5 (2.1)
Euro 12	3.4 (3.4)	1.6 (2.4)	2.0 (2.7)	2.6 (2.8)	2.4 (2.3)	2.6 (2.2)	1.6 (1.8)	1.9 (1.9)
Sweden's TCW								
export markets	3.2 (3.3)	1.4 (2.2)	1.8 (2.5)	2.5 (2.7)	2.2 (2.3)	2.5 (2.1)	1.7 (1.9)	2.0 (1.9)
OECD 19	3.4 (3.8)	1.0 (2.0)	1.5 (2.5)	2.6 (2.8)	2.2 (2.3)	2.2 (1.9)	1.6 (1.7)	1.8 (1.9)

	2000	2001	2002	2003
Market growth for Swedish exports*	10.8 (10.8)	3.7 (6.9)	5.4 (7.8)	7.4 (8.1)
OECD area export price in national currency	1.2 (1.2)	0.8 (1.3)	0.5 (1.0)	0.9 (1.2)
Crude oil price (USD / barrel, Brent Blend)	28 / (28 /)	25.6 (26.3)	23 () (23 ())	22 2 (22 2)

Note. In the United Kingdom CPI stands for RPIX and in Germany, France, Italy, Denmark and Finland for HICP. In Norway GDP refers to the mainland economy. The figures in parentheses are the assessments in the May Report.

Market growth for Swedish exports is measured in terms of imports of goods to all countries that are

recipients of Swedish exports, weighted with each country's share of total Swedish exports of goods 1998–99.

Source: The Riksbank

The international economic slowdown is synchronous in many respects, with a general fall-off in investment, poorer profit expectations and falling share prices (Figs. 8 and 9). The component that has sustained growth to date, in both the United States and the euro area, is private consumption, which has remained comparatively buoyant.

Falling share prices and interest rates confirm the global economic slowdown.

Economic developments and the financial markets are interrelated. Share prices and interest rates have gone on falling as economic activity weakens (Fig. 9).

Long bond rates in both Europe and the United States are lower than at the time of the May Report. The ten-year Federal and German government bond rates have fallen 0.9 and 0.4 percentage points, respectively. The credit spread between government and corporate bonds has widened in the United States since the terrorist attacks; in the first place this probably reflects increased uncertainty and a resultant fall in demand for corporate bonds that already had low ratings. The U.S. dollar has fallen more than 4 per cent against the euro since the May Report; half of this depreciation has occurred after the terrorist attacks (Fig. 10). The weakening began in July, however, partly in connection with a more pessimistic view of an economic recovery in the United States. A further gradual depreciation of the dollar against the euro is foreseen.

The aggregate monetary and financial conditions in the United States and the euro area are judged to be expansionary. Mainly because inflation is higher in the United States, the real interest rate is lower there but to some extent this expansionary effect is countered by a still strong dollar. Another downward effect is that stock markets have fallen in both the United States and the euro area. However, in a historical perspective the combined effect of real interest rates, exchange rates and share prices seems to represent a demand stimulus in both areas.

New statistics published before the terrorist attacks pointed to developments in the United States being worse than expected earlier. Unemployment had risen and consumer confidence had declined, which could lead to a weakening of consumer demand (Fig. 11). Moreover, residential construction has decreased, stock adjustments are still in progress and although the purchasing managers index (NAPM) had turned upwards, its level in September still indicated an economic slowdown (below 50, see Fig. 12).

The effects of the terrorist attacks on the American economy will depend in large measure on the security policy situation. The main scenario assumes that the conflict will be short-lived. Growth in the United States has been revised downwards for this and the coming year mainly on account of lost production and lower consumption and investment propensities. For 2003 there is just a marginal downward adjustment of growth.

Tax cuts equivalent to 0.5 per cent of GDP this year and 0.8 per cent in 2002 had been approved before the terrorist attacks. Subsequent measures approved by Congress include support equivalent to USD 40 billion, while further tax cuts and stimulatory measures totalling over USD 60 billion have been proposed. This would add up to a fiscal stimulus in 2002 of about 2.0 per cent of GDP.

Since the time of the May Report, moreover, the Federal Reserve's instrumental rate has been lowered 1.5 percentage points to 2.5 per cent. The market expects a further reduction of about 0.25 percentage points by the turn of this year. With the prospect of an economic upturn towards the end of 2002, a renewed interest rate increase is assumed. A weaker dollar is judged to partly counter the less expansionary monetary stance.

As long as demand is subdued and the outlook for profits is weak, it is reasonable to suppose that investment is less sensitive to interest rate cuts. But reconstruction and increased public spending on defence and security after the attacks may help to raise demand. At the same time, a recovery of investment and consumption will be linked to the development of confidence in the household and corporate sectors in the near future.

Figure 11. United States and euro area: consumer confidence.



Sources: Conference Board and EU Commission.





Sources: National Agency of Purchasing Managers and Reuters.

Figure 13. United States: business cycles. Seasonally-adjusted 12-month rate of GDP



Note. Growth at seasonally-adjusted annual rate (annual data up to 1947). NBER defines a recession as a significant decline in activity spread across the economy, lasting more than a few months, visible in industrial production, employment, real income, and wholesale-retail trade.

Source: U.S. National Bureau of Economic Research, Department of Commerce and the Riksbank.



All in all, economic growth in the United States is judged to pick up again in the second half of 2002. In that case, the cyclical path will be relatively similar to earlier recoveries in recent decades (Fig. 13). The main argument for a comparatively rapid recovery is an unusually expansionary economic policy. The main downside risks lie in a permanent weakening of confidence in the future in the wake of the terrorist attacks and a more protracted investment cycle.

The revised prospects for growth in the American economy have consequences for developments in the rest of the world. In the euro area, the poorer international development and the increased uncertainty arising from the security policy situation mean that growth in the coming years will be weaker than foreseen in the May Report. Labour market prospects have deteriorated and consumer confidence has declined (Fig. 11). Moreover, in September the purchasing managers index (PMI) continued to fall and so did business confidence, which confirms the slowdown in European manufacturing (cf. Fig. 12).

In the coming quarters, activity in the euro area will probably continue to slacken. A recovery is foreseen, however, during the latter part of 2002. Tax relief implemented in the first half of this year, for example in Germany and France, as well as further tax cuts that are planned for 2002, should underpin household consumption.

An easing of the monetary stance should also help to maintain activity in the euro area. Since the May Report the ECB has lowered its instrumental rate 0.75 percentage points to 3.75 per cent and market expectations point to further cuts of 0.25-0.5 percentage points up to the turn of the year. As the economic situation improves, it is assumed that the rate will be raised again towards the end of the forecast period.

A recovery in the Japanese economy is foreseen only towards the end of 2003; besides the impact of the global slowdown, measures proposed in the government's package of reforms will tend to dampen economic activity, for example through more business failures and higher unemployment. The outlook for emerging economies (Southeast Asia, Latin America and Eastern Europe) is also considerably worse than at the time of the May Report. Many of the Asian economies are heavily dependent on developments in the United States. Moreover, the increased risk aversion after the terrorist attacks is liable to exacerbate the situation, above all for countries with a current-account deficit.

Lower oil prices and weaker cyclical prospects give a lower rate of inflation.

In the May Report there was considered to be some risk of rising inflation in both the United States and the euro area. But during the summer inflation has fallen back in connection with a slowing of the price increases for energy and food (Fig. 14). In view of weaker economic prospects and lower oil prices, inflation is expected to go on falling in the rest of this year and the beginning of 2002. The barrel price of oil largely followed the forecast in the May Report up to the time of the terrorist attacks in the United States. Immediately after the attacks the price rose to USD 31 but since then, concern about an economic slowdown has pushed it down to about USD 21. The oil price forecast has been revised downwards 50 cents for 2001 to USD 25.6 and by almost one dollar for 2002 to USD 23. The forecast for 2003 is unchanged at USD 22.2/barrel.

Developments in the field of security policy could, however, lead to higher oil prices. This is confirmed by oil price options (Fig. 15).

Other commodity prices have fallen more than expected since May. With poorer international economic prospects, the future price trend is expected to be more subdued that assumed earlier.

The broader and deeper international economic slowdown is also expected to cause international export prices to rise more slowly than foreseen in the May Report. Mainly as a result of falling capacity utilisation in the major OECD countries, the price rise both this year and in the next two years is now calculated to be slacker than was foreseen at the beginning of the summer.

To sum up, the economic slowdown in the rest of the world has become more pronounced than foreseen in the May Report. Lower profit expectations, lower share prices, subdued investment and a quicker adjustment of the imbalances in household saving contribute to a downward revision of growth in the United States in particular but also in other industrialised countries. The increased uncertainty arising out of the terrorist attacks and the security policy developments accentuate the risks, at least in the short run. At the same time, historical cyclical patterns and a markedly expansionary economic policy favour a recovery. Compared with the assessment in the May Report, the cyclical upturn has been shifted into the future and is now calculated to get under way around the middle of next year. Figure 15. Price of crude oil (Brent) with the uncertainty interval calculated from option prices on 5 Ocotber 2001.



Note. The five uncertainty intervals, from the lightest to the darkest, represent the 10, 30, 50, 70 and 90 per cent probabilities of the price of oil being inside the respective range.

Sources: IPE and the Riksbank.

THE TERRORIST ATTACKS IN THE UNITED STATES

The terrorist attacks in the United States are a negative factor for economic development, which was already weak. In the coming quarters the predominant effect will be a drop in output and demand, not least in sectors that are hit directly, for example financial markets, aviation and recreation. In addition, the increased uncertainty may weaken the confidence of households and firms. In the somewhat longer perspective, the reconstruction of infrastructure will involve increased investment; demand will also be reinforced by increased public spending. In the main scenario, the terrorist attacks have a downward effect on growth in the next four quarters, with a limited net effect after that. There is, however, a risk of the effects being more substantial on account of continued uncertainty and unrest.

EFFECTS IN THE COMING QUARTERS

In the short run the economic effects will materialise in a variety of ways:

• The immediate effect of the terrorist attacks is a direct loss of production. Certain activities were suspended in connection with the attacks and production decreased in others. The impact on GDP growth in the coming quarters can amount to several tenths of a percentage point.

• The attacks can also lead to a more permanent drop in output, concentrated to the regions and sectors that are affected directly. Examples of such sectors are finance, aviation, insurance and tourism. In the United States their combined share of GDP is between 6 and 9 per cent.

• A short-term drop in consumption is another probable consequence of the attacks. In the past, periods of increased uncertainty, such as war or political crises, have affected spending on durables and residential investment, for example.

The effects in the coming quarters will probably be substantial. By itself, the impact can warrant a downward revision of GDP growth this year and next of several tenths of a percentage point.

EFFECTS IN THE COMING YEARS

The effects in the coming years are likely to be conditioned by the loss of capital stock, increased public spending, tax cuts, monetary easing and the development of people's confidence in the future.

To illustrate how the economy could be affected, certain effects have been separately simulated in a global econometric model (Table B6).¹⁷ The first simulation assumes that the capital stock is reduced by USD 40 billion in 2001 Q3.¹⁸ The second assumes that public spending in the coming years is increased by an additional 5 per cent a year, and the third that share prices fall about 10 per cent.

Table B6. Deviations from the base scenario for the United States. Difference in annual percentage change figure (current-account balance: difference in annual change; instrumental rate: difference)

		Сарі	tal stoo	ck* Pu	ublic co	nsumpt	ion** S	hare pr	ices***
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
GDP	0.0	0.0	0.0	0.4	0.3	-0.4	-0.4	-0.2	-0.2
Investment	0.1	0.0	-0.1	0.5	0.0	-0.8	-1.0	-1.0	-0.4
Private									
consumptio	n 0.0	0.0	0.0	-0.1	-0.8	0.0	-1.0	-0.8	-0.4
Inflation	0.0	0.0	0.0	0.2	0.5	-0.6	-0.2	-0.4	-0.4
Current-acc balance	ount								
(% of GDP)	0.0	0.0	0.0	-0.1	-0.2	0.0	0.0	0.6	0.2
Instrumenta	I								
interest rate	e 0.03	0.00	0.00	0.7	0.5	-0.4	-0.8	-0.4	-0.2

The capital stock shock is modelled as a fall of 0.2 per cent, which is equivalent to a capital loss of about USD 40 billion.

** Public consumption is assumed to be stepped up 5 per cent in year 1 and another 5 per cent in year 2; this increase includes an expansion of military expenditure by about 15 per cent a year.

*** The share price fall is modelled as a permanent 0.3 per cent increase in the risk premium for shares; in NiGEM the increased premium also has a direct effect on corporate investment decisions.

The modelled effects of the decreased capital stock are small. In the event of a negative shock that reduces the capital stock, economic equilibrium is restored through increased investment. The moderate impact of the loss of capital tallies with experience of other types of disaster, such as floods, earthquakes and landslides, where the effect turned out to be slight even though the short-term loss of production was considerable.¹⁹

- 17 The National Institute Global Econometric Model (NiGEM) from the National Institute of Economic and Social Research, London.
- 18 The figure of USD 40 billion is an assumption, not an estimate; estimates from the insurance sector range from USD 15 billion to 50 billion.
- 19 The twenty most extensive disasters between 1971 and 1995 were reviewed for the turn of the millennium in the annual report to Congress from the U.S. President's Council of Economic Advisors. Although the damage in a number of cases (e.g. hurricane Andrew in 1992 and the California earthquake in 1994) amounted to more than 1 per cent of GDP, the effect on GDP was so limited that it did not show up in the average annual figure.

A major increase in public spending is foreseen in the years ahead. A package totalling about USD 40 billion has already been initiated. Half of these public funds has been earmarked for the reconstruction of New York and half for defence and security. Moreover, support will be provided for the industries that have been hit, e.g. aviation. Further tax relief for households and firms, in the region of USD 50- 60 billion, has been proposed. More spending on defence is likely, too. The additional public expenditure after the attacks could total the equivalent of up to one per cent of GDP.

The terrorist attacks have led to increased uncertainty and this can affect household and business confidence. Dwindling optimism about the future can have a number of economic effects. One of them, falling share prices, has already been seen. That in turn has a negative impact on both investment and consumption; the depressive effect is considerable but fades comparatively quickly.

The overall assessment of the net effects of the terrorist attacks in the United States is that, according to the simulations, they will be considerable in the short run; but when allowance is made for existing and foreseeable measures of economic policy, the consequences for growth prospects in the coming years are probably small.

The net impact on inflation prospects will probably be slight. Inflation increased appreciably in connection with the Korean, Vietnam and Gulf wars. After the terrorist attacks, both financial market pricing and survey data on attitudes indicate that inflation expectations have, if anything, fallen.

EFFECTS ON CONSUMER CONFIDENCE AND HISTORICAL PARALLELS

The indirect effects of the terrorist attacks in the United States could be more extensive than assumed above. Historically, political unrest and war have tended to weaken consumers' confidence in the future. The escalation of the Vietnam war and the resignation of President Nixon coincided with consumer confidence's largest and second largest drop, respectively, in the last four decades. Consumer confidence also declined sharply both when the United States invaded Panama and when Iraq invaded Kuwait.

In that saving is currently low - as can be seen from the household saving ratio as well as the deficit on current account - the situation is precarious. Increased anxiety can elicit or accelerate an adjustment of the imbalances that leads to larger effects on the real economy. If people perceive the attacks as the beginning of a long period of uncertainty, there is a major risk of consumption and investment falling more appreciably.

Comparing the present situation with earlier period of military conflict is difficult. Both the Korean and the Vietnam war entailed an increase in defence spending (about 15 and 10 per cent of GDP, respectively) that is hardly relevant today. Iraq's invasion of Kuwait and the subsequent Gulf war are somewhat more recent events but they, too, did not affect the domestic economy and civilian life in the United States as directly as the present attacks on New York and Washington. The Gulf war probably contributed to the weakness of growth in both 1990 and 1991 but the recovery was comparatively rapid.

An important difference from the situation in the early 1990s is that the present scope for measures of economic policy is greater. Inflation was then above 5 per cent and the consolidated public sector showed a deficit equivalent to about 5 per cent of GDP. The situation in the rest of the world also differs appreciably. High growth in Japan and the strong expansion in Europe after German reunion provided a strong international driving force for the United States in the early 1990s. Today, economic activity is slowing more simultaneously throughout the world.

EFFECTS ON POTENTIAL GROWTH

The long-term effects that the terrorist attacks may have on potential growth are difficult to assess. One effect that will presumably be permanent is tighter security requirements and more extensive administrative routines, both in aviation and in other sectors. Increased transaction and transport costs are negative for potential growth. On the other hand, reconstruction implies a modernisation of capital stocks, which may be associated with some positive externalities via technical innovations. Increased defence expenditure may have a similar effect. All in all, the combined effects on potential growth are probably limited.



Source: Conference Board.

Figure 16. Real interest and exchange rates. Per cent and index: 18 November 1992=100



Source: The Riksbank

Monetary conditions and inflation expectations

The combined effect of real interest rates and the real exchange rate is now more expansionary than at the time of the May Report as well as in an international comparison.

Lower real interest rates and a weaker real exchange rate are contributing to an economic stimulus that is now stronger than in the late spring. It is above all the real exchange rate that has weakened since the May Report but real interest rates have also fallen (Fig. 16). The impact of the exchange rate and interest rates in Sweden is more expansionary than in the euro area and the United States, for example. In a broader assessment that also includes stock markets, the expansionary shift has been countered by falling share prices.

Expectations of inflation two years ahead are currently just above 2 per cent.

Households' expectations of inflation one year ahead, as measured in the survey of purchasing plans (HIP), rose in the late spring and early summer. Since then, these expectations have fallen back, to 2 per cent in September. According to Statistics Sweden's latest survey, market players' expectations of inflation two years ahead are unchanged from May at 2.1 per cent, while the expected rate five years ahead has become somewhat higher (Table 4).²⁰ Higher inflation expectations both two and five years ahead were reported, however, by other groups in the survey, for example purchasing managers and labour market organisations. But notwithstanding some increase in expected price developments since the May Report, the expected repo rate two years ahead is now lower than in May, partly on account of the weaker economic prospects.

Table 4. Expected rate of CPI inflation

Annua	I rate,	per	cent	
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Expected inflation 1 year aboad		
Money market agents	2.2	(0,3)
Employer organisations	2.2	(0.6)
	2.0	(0.0) (0.5)
Employee organisations	2.3	(0.5)
Purchasing managers, trade	2.6	(0.5)
Purchasing managers, manufacturing	2.5	(0.3)
Households (HIP)	2.0	(0.2)
Manufacturing firms (July (April) business tendency survey)	2.1	(0.6)
Services firms (July (April) business tendency survey)	2.2	(0.7)
Expected inflation 2 years ahead		
Money market agents	2.1	(0.0)
Employer organisations	2.4	(0.2)
Employee organisations	2.4	(0.6)
Purchasing managers, trade	2.5	(0.4)
Purchasing managers, manufacturing	2.5	(0.3)
Expected inflation 5 years ahead		
Money market agents	2.1	(0.1)
Employer organisations	2.3	(0.2)
Employee organisations	2.2	(0.2)
Purchasing managers, trade	2.6	(0.4)
Purchasing managers, manufacturing	2.6	(0.3)

Note. The data are based on Statistics Sweden's survey in September unless indicated otherwise; the figures in parentheses are the change in percentage points from the previous survey.

Sources: National Institute of Economic Research and Statistics Sweden

20 The survey was made in the period 17-21 September and thus mostly after the Riksbank's decision to lower the repo rate 0.5 percentage points was announced on 17 September.

Market expectations of an unchanged reportate up to the turn of the year.

The picture of monetary policy expectations has changed a number of times since the spring. In June, short-term interest rates rose as the exchange rate weakened and also following statements by members of the Riksbank's Executive Board. The repo rate increase of 0.25 percentage points early in July was therefore expected by the market. During the summer, short-term interest rates fell back when cyclical indicators mainly pointed downwards and the krona's depreciation slowed. In September, just before the terrorist attacks in the United States, both implied forward interest rates and market surveys pointed to expectations of an unchanged repo rate in the coming twelve months (Fig. 17). Following the attacks in the United States, the Riksbank lowered the repo rate 0.5 percentage points, in keeping with other central banks. Statistics Sweden's latest survey shows that money market players currently count on an unchanged repo rate three months ahead and this is in line with market pricing in the form of implied forward interest rates. The survey also points to expectations of a reporate increase to 4.0 per cent twelve months ahead and further increases totalling 0.5 percentage points after two years.21

The development of international interest rates has clearly left its mark on interest rates in Sweden. Since the September repo rate cut, short-term interest rates have fallen; together with the current rate of inflation, this means that the real three-month interest rate is now somewhat lower than in May. The real fiveyear interest rate has likewise fallen somewhat since the May Report, mainly due to the concurrent worsening of economic prospects in Sweden and the rest of the world.

The Swedish yield curve is currently somewhat steeper than at the time of the May Report, in keeping with the situation in the United States and Germany, for example. This mainly has to do with the appreciably lower short-term interest rates. Moreover, increased uncertainty about global economic prospects are contributing to higher demand for interest-bearing assets with shorter maturities. Long-term interest rates, on the other hand, have fallen only marginally since May.

The long-term interest rate differential with Germany has widened and is expected to stabilise at a somewhat higher level than envisaged earlier.

The long-term interest rate differential with Germany has widened since the May Report (Fig. 19). In the first place this probably has to do with an increased exchange rate premium in the wake of the krona's depreciation and increased international unrest. Another factor could be somewhat greater uncertainty about future government borrowing and thereby the supply of Swedish

Figure 17. Repo rate and expected rate implied by forward interest rates and survey data. Daily quotations, per cent



Sources: Statistics Sweden and the Riksbank.

²¹ The median value of the expectations.



Figure 18. Actual and expected difference between Swedish and German instrumental rates. Percentage points



Note. Expected difference up to 10 years ahead derived from implied forward interest rates.

Source: The Riksbank.

government bonds. The difference between the expected instrumental rates in Sweden and Germany ten years from now, which can be interpreted as an indication of monetary policy's long-term credibility, has become somewhat wider but is still very small from a historical perspective (Fig 18).

The long-term interest rate differential with the rest of the world is now expected to remain somewhat higher than foreseen in May, which means that despite somewhat weaker economic activity, long-term interest rates will be marginally higher than expected in May. As the Swedish economy recovers during the forecast period, the ten-year government bond rate is expected to move up to about 5.5 per cent.

Lending to the non-bank public has gone on rising.

The annual growth of credit to the non-bank public is still high but in recent months the rate has slackened, to just over 8 per cent in August. The relatively strong activity in the property market is probably one factor behind the persistently high rate of household borrowing. Monetary aggregates - notes and coins (M0) as well as the broader M3 - are growing more slowly.

THE KRONA'S PATH

Since 1975 the Swedish krona's effective nominal TCW exchange rate has weakened almost 90 per cent. The fact that for long periods, inflation in Sweden was higher than in the rest of the world accounts for approximately half of this deterioration, while the other half is explained by a depreciating real exchange rate.

A real exchange rate measures the level of costs or prices in one country relative to other relevant countries in a common currency. The question of whether a currency is over- or under-valued is often discussed in terms of the real equilibrium exchange rate, which is the level associated with external and internal balance. Internal balance implies full resource utilisation in the domestic economy, external balance that foreign debt is not growing uncontrollably.

So what are the forces behind the real exchange rate and its equilibrium level? The doctrine of purchasing power parity asserts that two countries should have identical price levels expressed in a common currency, in which case the real exchange rate will be constant over time. Inter-country differences in the rate of inflation will be balanced by nominal exchange rate movements. A historical review shows, however, that in practice the real exchange rate tends to fluctuate (Fig. B6).²² As purchasing power parity seems to hold only in the very long run, there will accordingly be considerable periods when the real exchange rate is under- or over-valued.

There are other theories for explaining the real exchange rate. According to one of them, the real equilibrium exchange rate is determined by a combination of countries' relative rates of productivity growth and their terms of trade (the relative price of a country's goods in the world market). It is easy to see that the development of the balance on current account can also play a part.

Terms of trade. A relative deterioration in terms of trade implies that the country in question earns less on exported goods and pays more for imports. Another way of putting this is that imported goods become more expensive in relation to domestic products. To pay for a given volume of imported goods, the country has to sell more exports or consume fewer imports. In order



lack of observations for 1940–47; see also the footnote on this page. Data up to the end of September 2001.

Sources: IMF and the Riksbank.

²² The curve represents the effective real exchange rate, calculated by weighting together the average annual bilateral real exchange rates with Sweden's main trading partners (in this case the G-10 countries plus Denmark, Finland and Norway), using (relative) TCW weights.

trade 160 16 150 150 140 130 120 110 100 100 90 90 80 81 90 02 75 78 84 87 93 96 Real TCW Trend rate based on relative GDP and terms of trade

Figure B7. Real and trend TCW index based on a

Source: The Riksbank

to restore equilibrium, the real exchange rate has to weaken.

Productivity growth. Stronger productivity growth compared with the rest of the world will lead to an appreciation of the real exchange rate to equalise the competitive position with the rest of the world. High productivity growth is usually associated with a comparatively high potential GDP growth rate. In a country where GDP growth is higher than in the rest of the world, the real exchange rate should therefore normally tend to appreciate. However, the theoretical relationship between productivity growth and the exchange rate is not clear-cut; under certain assumptions it may be reversed.

Current-account balance and foreign debt. A country with a persistent current-account deficit will generate more and more foreign debt and thereby increasingly large interest payments. A weakening of the real exchange rate is required so that the country can export more and finance the interest payments. In a country where the net external position is negative there may therefore be periods when the exchange rate is weak. The current account and external debt can also be affected by other factors such as demographic developments.

In addition to the above, it is conceivable that the krona is affected by factors that to some extent stem from currency markets flows. The most general flowrelated explanation is the short-term interest rate differential. Another factor that has affected the exchange rate from time to time is the state of the government finances; growing government debt can lead to expectations of higher inflation.

Assessments of the krona's future path are bound to be uncertain. Simple estimations suggest that an interpretation of this path can be guided by the relationship between the real exchange rate, relative GDP growth differences and terms of trade. The real exchange rate's path in the 1970s and 1980s, for example, can be explained to a large extent by the relatively weaker growth in Sweden and deteriorating terms of trade. Real TCW and an estimation with such a model are presented in Fig. B7. However, there have been certain periods, for example 1990-93 and the past two years, when the path has been more difficult to explain. Relative GDP growth in recent years would speak, if anything, in favour of a stronger exchange rate, while the poorer terms of trade in the past year can account for only a minor part of the depreciation.



So has the exchange rate been affected by other factors in recent years? As the long-term interest rate differential with Germany has been more or less constant, there are no grounds for supposing that uncertainty about economic policy has been important. Neither is it likely that the differential in short-term rates has played a major part, although the possibility of effects from time to time cannot be ruled out.

The exchange rate discussion has focused recently instead on the effects of specific flows. There has, for example, been a close relationship in recent years between the exchange rate and the Stockholm stock market (Fig. B8). It looks as though the krona has tended to weaken when foreign investors have withdrawn from the stock market. A similar effect seems to have come from Swedish investors' sizeable purchases of foreign securities (partly in connection with altered investment regulations for the new national pension system). The Stockholm bourse also reflects the real economic situation. The slump in IT and telecom shares is also due to weaker terms of trade; at the same time, the problems for these industries have resulted in lower export receipts.

A weakness of explanations of this type is that the effects do not seem to be either systematic or symmetric. Periods when share prices have risen, for example, have not been accompanied by a strong appreciation of the krona. Neither does there seem to have been any clear relationship between the exchange rate and the Stockholm stock-market before 1999 (Fig. B8). Nor has the exchange rate depreciated in other countries where the stock market has fallen, for example the United Kingdom, Switzerland and Japan. In the absence of a firm foundation for assuming that the exchange-rate effects of flows are systematic, their value as forecasting variables is comparatively limited.

An overall assessment of the Swedish krona's path prompts three central conclusions:

• One important explanation for the nominal depreciation in recent decades is that inflation was higher than in the rest of the world. This accounts for approximately half of the nominal depreciation since the 1970s. The other half - the depreciation in real terms - is mainly due to GDP growth in Sweden being lower in long periods than in the main competitor countries.

• Since the policy realignment in the 1990s, inflation and growth in Sweden have been in line with the rest of the world. Against this background, there are no



0.40004

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grounds for expecting marked deviations in the future. It is therefore unlikely that the krona's depreciation can be explained by these factors. Although terms of trade have deteriorated in the past year, that is hardly a reason for seeing this as something which will burden the krona in the future.

• The depreciation in recent years is presumably connected to some extent with factors such as portfolio flows and financial unrest. Another element has been a cyclical fall in export receipts. These are factors that should be largely reversed when a recovery comes.

A number of more structural explanations of the krona's weakening have also been aired in the public debate. Examples are the structure of the tax system, the internationalisation of companies with the attendant relocation of certain functions, the status of the Swedish krona as the importance of the euro grows in Europe, and so on. Work is in progress at the Riksbank to arrive at a better understanding of how aspects of this type are also likely to affect the krona.²³

The nominal TCW exchange rate has depreciated more than 6 per cent and is considerably weaker than foreseen at the time of the May Report (Fig. 20).

The path of the krona has been considerably weaker than expected earlier.

Since the May Report there is a number of factors that may have affected the Swedish krona (see the box on pp. 41- 44). When export activity slackens as markedly as last spring, there is liable to be some reappraisal of the krona's value. Moreover, the Swedish stock market has fallen more than bourses in many other countries and the introduction of the new national pension system has entailed a currency outflow. In September there was a further depreciation, connected not with specifically Swedish circumstances but with widespread concern after the terrorist attacks in the United States. The recent events seem to have contributed to currency depreciation in a number of countries with a flexible exchange rate, for example Sweden, Australia and New Zealand.

The Swedish krona is undervalued and an appreciation is expected during the forecast period, though to a weaker level than foreseen in the May Report.

The krona is currently considered to be greatly undervalued and economic fundamentals, such as relative growth and a currentaccount surplus, favour an appreciation. Moreover, a number of the factors that have weakened the krona in the past year are judged to have the opposite effect in the rest of the forecast period. Next year, for example, exports are expected to turn upwards, accompanied by a stabilisation and some recovery in the stock market. But in view of the initial position, the appreciation in the coming two years is expected to reach a level that is weaker than foreseen in the May Report. The krona, like the euro, is assumed to appreciate against the dollar and sterling, both of which are considered to be overvalued. The krona is also expected to appreciate against the euro. In the main scenario the TCW index is now expected to average 137 this year, followed by just over 138 in 2002 and under 130 in 2003.

To sum up, the combined effect from interest rates and the exchange rate has become more expansionary since the May Report. The Swedish stock market, which has been weaker than in many other countries, is having the opposite effect. Inflation expectations are approximately in line with or just above the Riksbank's target. Figure 19. Ten-year government bond rates in Sweden, Germany and the United States and the Swedish-German differential.



Source: The Riksbank.

Figure 20. The krona's nominal effective TCW exchange rate and the rates against USD and EUR. Daily quotations, index: 18 November 1992=100



Source: The Riksbank.

Demand and supply in the Swedish economy

GDP GROWTH REVISED DOWNWARDS

In the May Report, this year's GDP growth in Sweden was judged to be 2.2 per cent. As the slowdown has been more marked than foreseen at that time, there are grounds for a downward revision of growth both this year and next (Table 5).

Consumption and investment in the first half of 2001 were weaker than expected earlier. Falling share prices have been negative for household wealth and both households and firms have become less confident about the future. Exports have also been weaker than expected, partly due to slack demand in the rest of the world; another important factor here is a disadvantageous product mix in exports. But as imports have also been weaker, the contribution to GDP growth from net exports is broadly in line with the assessment in May.

Table 5. Demand and supply in the main scenario. Percentage annual volume change

	2000	2001	2002	2003
Household consumption	4.1	0.8 (2.4)	2.1 (2.5)	2.1 (2.4)
Public authorities consumption	-1.7	0.8 (1.1)	0.9 (1.0)	0.9 (1.0)
Gross fixed capital formation	4.5	3.3 (5.0)	2.7 (4.5)	6.5 (6.9)
Stockbuilding	0.6	-0.3 (-0.4)	-0.1 (-0.1)	0.0 (0.0)
Exports	9.8	1.3 (5.9)	5.9 (6.1)	6.2 (6.3)
Imports	9.7	0.6 (6.1)	5.3 (6.1)	5.9 (6.5)
GDP	3.6	1.3 (2.2)	2.2 (2.5)	2.8 (2.9)

Note. 2001–03 forecast; the figures in parentheses are the assessment in the May Report. Stockbuilding is represented by the contribution to GDP growth in percentage points.

Sources: Statistics Sweden and the Riksbank.

Even with the downward revision of demand in the rest of the world, the prospects for a recovery in Sweden in the next two years are considered to be comparatively good. This mainly has to do with strong growth of real disposable income, which stems in turn from relatively stable employment, substantial tax cuts and declining inflation, for example. Furthermore, the comparatively low interest rates stimulate domestic demand and a weak exchange rate represents a considerable cost advantage for Swedish producers.

Foreign trade abruptly checked this year but recovers in 2002 and 2003.

For the period 2001-03, in the May Report annual export growth was expected to average around 6 per cent. Outcome figures show, however, that in the first half of this year exports of goods were lower than a year earlier, though export growth for services was fairly strong. An important explanation for declining exports of goods is the weaker international demand. Another is effects from the product mix in Swedish exports. For example, exports of electrical goods and computers, including telecom products, dropped 16 per cent in the first half of this year and exports of road vehicles fell 8 per cent; the negative contribution from these two items to the volume growth of exports of goods was almost 5 percentage points. At the same time, export growth in the first half-year was strong for other items, for example medical products and food.

The development of exports in the forecast period presupposes that a large part of the negative effects of the structural changes in the telecom industry have already occurred or will do so in the near future. So for exports in 2002 and 2003 the consequences of the product mix are judged to be limited. Moreover, business tendency data suggest that the fall in manufacturing orders for exports has slowed, though this is not yet the case for telecom products (Fig. 21). During the forecast period, market growth is judged to increase while market share is approximately unchanged.

Imports of goods in the first half of 2001 were also lower than a year earlier, due in the first place to slacker demand growth but also to the weaker exchange rate. During 2002 and 2003 import growth is expected to move up, mainly because demand picks up again and also in connection with the krona's appreciation. In all three years, however, net exports' contribution to GDP growth is judged to be positive.

Expansionary fiscal policy.

Fiscal policy in the coming years is judged to be expansionary, primarily in view of continued tax cuts. This is evident from, for example, the increasingly positive overall effect on household income from taxes and transfers. Another sign is the deterioration in the public sector's structural balance (Fig. 23). Income tax cuts next year have been presented in the Budget Bill in the form of compensation for the earlier increase in personal social security contributions. It is assumed that the Government will take the fourth and final step in this compensation in 2003. As a result of the economic slowdown, together with the tax cuts and increased spending, it is judged that in both 2002 and 2003 the consolidated public sector's financial balance will be below the official target of a surplus that averages 2 per cent of GDP over the business cycle.

Notwithstanding the slackening of demand and the cyclical sensitivity of the public finances, it is judged that the deterioration of the public finances will be relatively moderate. The consolidated public sector's financial balance has been revised downwards from 2.9 to 1.0 per cent of GDP next year and from 2.7 to 1.1 per cent in 2003. The continuation of a good development of employment and comparatively strong consumption growth help to sustain the balance. In recent years, the central government's financial balance has been strengthened by net transfers from the national supplementary pension system in connection with the introduction of the new pension system.



Note. Net balance calculated as the proportion of firms reporting an ex post increase less the proportion reporting a decrease. The latest survey in the series was made in September 2001 before the terrorist attacks in the United States.

Source: National Institute of Economic Research (business tendency surveys).





Sources: National Institute of Economic Research and the Riksbank.

balance



Figure 23. Consolidated public sector financial

Sources: Statistics Sweden and the Riksbank

Figure 24. Household purchases of durable and non-durable goods Percentage annual change, constant (1995)



Source: Statistics Sweden

A central government surplus is foreseen this year even excluding the large extraordinary transfers from the pension system (Table 6). In both 2002 and 2003 the central government's financial balance is calculated to be negative.

Table 6. Central government financial balance SFK billion

	1999	2000	2001	2002	2003
Reported balance	78	27	164	-35	-44
Transfers, net	96	13	155	0	0
Underlying balance	-18	14	9	-35	-42

Sources: National Institute of Economic Research and the Riksbank

In view of the marked economic slowdown there is an appreciable risk that with an unchanged policy, central government spending will exceed the expenditure ceiling. While the effects on inflation from increased government spending would probably be small in the current situation, exceeding the ceiling could harm fiscal policy credibility in the longer run, leading to higher interest rates, for example.

Improved local government finances make public consumption more stable.

Consumption expenditure by public authorities in the first half of this year was 0.5 per cent higher than a year earlier, which is less than expected. Consumption by central government authorities fell. Their annual consumption is expected to fall this year, followed by little change in 2002 and a slight increase in 2003. It is mainly decreased defence appropriations that are expected to hold back central government consumption.

Despite the economic slowdown, in the local government sector the financial situation is generally good, with growing tax revenue and increased central government grants. However, spending plans in this sector are restricted by the stipulation that county councils and municipalities are not to have a budget deficit. This constraint is no doubt most relevant for the county councils, which have problems with financial deficits. Even so, total local government consumption is judged to rise throughout the forecast period at a steady annual rate of about 1 per cent.

Expectations are important for private consumption.

The growth of household consumption expenditure has been weaker than expected earlier. This applies to consumption of durable goods in particular but consumption of non-durables and services has also been on the low side.

Consumption of durable goods shows clear peaks in the late 1980s and the turn of the 1990s (Fig. 24). The peaks coincided with those in the 10-11-year cycle of car sales but also with strongly rising share prices on the Stockholm exchange. Purchases of durable goods are naturally more sensitive to changes in wealth than is the case with non-durables and services but they also depend on disposable income as well as the age and state of households' capital goods.

In the forecast period, household spending on both durable and non-durable goods and services is expected to rise. Crucial factors here are households' appraisal of the future development of income and wealth.

To date this year the equity wealth of households has fallen by an average of 30 per cent from the same period a year earlier. Meanwhile, however, house prices have risen at a comparatively stable rate, about 7 per cent to date this year from the same period a year earlier (Fig. 25). The increase in household debt has been relatively high, about 8 per cent. In real terms, household net wealth has fallen to date this year by about 10 per cent.

Studies show that in the short run the development of household consumption can be explained in the first place by people's expectations of their own economy. During the past year this indicator has tended to fall; the proportion of households counting on an improvement in this respect exceeds the proportion foreseeing a deterioration by 20 percentage points. Pessimistic expectations predominate markedly as regards the national economy and unemployment (Fig. 26).

The negative development of households' wealth and their decreased optimism are judged to affect consumption mainly this year, when growth is expected to stop at 0.8 per cent. In the coming years it is reasonable to assume a more balanced development, given some recovery of share prices but a somewhat slower increase in house prices. The massive stock market fall is likely to induce households to adjust balance sheets by reducing debt. All in all, household real wealth is judged to rise slowly in the coming two years and thereby make a limited but positive contribution to the growth of consumption.

Real disposable income is now expected to rise somewhat faster than the Riksbank envisaged earlier, particularly in 2002 and 2003. This is mainly because the effects of approved tax cuts and transfers are considered to be greater than allowed for earlier. Against this background, the annual growth of household consumption in both 2002 and 2003 is put at just over 2 per cent. The rate may seem high but it can be combined with a relatively marked simultaneous increase in household saving relative to disposable income (Fig. 27).

Subdued investment growth.

With the fall in capacity utilisation, investment growth has slackened. According to business tendency data from the National Institute of Economic Research, the proportion of firms reporting machinery and plant as the chief obstacle to increased production fell from Q1 to Q2 this year. This is judged to reduce the need for new manufacturing investments in such capacity. This year's share price fall, which can be seen as a token of uncertainty about future corporate profits, will also contribute to the less favourable climate for investment in the coming years. Lower

Figure 25. Share and house price indices. Percentage 12-month change



Note. Affärsvärlden's all-share index; Statistics Sweden's house price survey.

Source: The Riksbank.

Figure 26. Households' expectations of their own economy, Sweden's economy and unemployment. Net balance



Note. The sampling procedure for the HIP survey was changed as of 2000.

Source: Statistics Sweden.

Figure 27. Ratios of households' post-tax interest expenditure, saving and debt to disposable income. Per cent



Sources: Statistics Sweden and the Riksbank.



Figure 28. Econometric estimates of the output

Note. Data presented as moving four-quarter means. H-P stands for the Hodrick-Prescott (or Whittaker-Henderson) filter, UC is the unobserved components method and PF is the production function approach.

Sources: Statistics Sweden and the Riksbank.

real interest rates counter this to some extent. Moreover, construction of networks for the third generation of mobile telephony will be positive for investment in the rest of the corporate sector. However, the size and timing of these investments are still uncertain and difficult to predict.

Residential investment has been revised downwards since the May Report, giving a somewhat slower recovery from the low levels in recent years. An increase in the construction of new housing, ordinary rented dwellings in particular, is judged to be difficult in the expanding regions, for example due to shortages of unutilised land and building sites as well as inadequate planning. This is accompanied by a housing surplus in other parts of the country. Even so, the growth of residential investment in the forecast period is judged to be relatively strong. Support for this assessment can be found, for example, in the National Institute's business tendency survey, which shows a good order situation for construction firms, particularly for those mainly active in residential construction and other house-building operations.

Total manufacturing stocks fell from Q1 to Q2 this year, including an appreciable reduction of finished goods. The business tendency data show that in both manufacturing and trade, dissatisfaction with unduly large stocks has decreased in recent months. As in the May Report, the contribution to GDP growth from changes in stocks is judged to be slightly negative both this year and next, followed by the assumption of a neutral effect.

SUPPLY AND RESOURCE UTILISATION

The July business tendency survey suggests that between Q1 and Q2 the utilisation of production factors decreased. An exception is construction, where the labour shortage rose. In manufacturing, the proportion of firms with production factors as the primary bottleneck went on falling but the changes in labour shortages from the previous survey are small. In business services and computer consultancy, the proportion of firms reporting full capacity utilisation has decreased, in the latter case to a marked extent.

Lower resource utilisation.

An indicator of total resource utilisation is the output gap. The combined picture from the three estimations of the gap points to decreased resource utilisation (Fig. 28). Considering the weak growth between the first two quarters this year, that is not surprising.

The Riksbank has previously counted on the Swedish economy being able to expand in the long term at an annual rate of 2-2.5 per cent without this leading to an acceleration of inflation. Given the present growth forecast, the economy's unutilised resources will grow this year as well as in most of 2002. Towards the end of the forecast period, however, resource utilisation rises successively again. In that growth is weaker than foreseen in the May Report, resource utilisation is lower throughout the forecast period.

Strong employment trend is checked.

Employment in the first eight months of this year was an average of 2.6 per cent higher than in the same period last year. Recently, however, employment has virtually stopped rising. A more subdued development of future labour demand is also indicated by a continued fall in the number of new job vacancies (Fig. 29). Moreover, the number of persons affected by redundancy notices has risen sharply, albeit from a low level; a majority of those affected are in manufacturing.

Hours worked rose more slowly than the number in employment in the first half of this year, which meant that average hours worked decreased; higher absenteeism for illness accounts for a large part of the change, accompanied by less overtime work. The tendency is expected to cease in the coming years; increased concern about unemployment can lead to a renewed fall in absenteeism for illness, though overtime may rise again when economic activity turns upwards.

Labour force growth has also remained strong this year, with an increase in the first eight months of 1.5 per cent. The inflow has come mainly from a growing number of young entrants but there has also been a reduction of participation in labour market programmes and increased labour market participation among students. In recent months, however, the labour market inflow has slackened.

In the years ahead, the scaling back of labour market programmes is expected to generate a relatively large increment to the labour force. This is countered, however, by effects of the active population's composition by age. The shifts in the demographic profile are most notable in the youngest and oldest age groups, where labour force participation is low.

In spite of the weakening of demand, the strong employment trend to date this year means that the employment forecast for 2001 does need to be revised appreciably. For 2002 and 2003, however, employment is now expected to be somewhat weaker than envisaged in the May Report. The weaker labour demand is the main reason for this. Labour force growth next year is expected to match the increase in employment, so that open unemployment is unchanged. During 2003, employment is once more expected to rise somewhat faster than labour supply (Fig. 30).

Historically, average labour productivity has broadly co-varied with the business cycle.

Productivity growth this year is expected to be weaker than assumed in the May Report because it seems that to a fairly large extent, firms have chosen to maintain their workforce even though demand has slackened. This behaviour may be a sign that firms count on the economic slowdown being short-lived and it implies that a productivity potential is available for a renewed upswing in demand. At the same time, the overall slackening of productivity is partly a sectoral effect, that is, economic growth has been checked

Figure 29. New job vacancies, number unfilled after 10 days and the ratio between them.



Note. The ratio can be interpreted as an indicator of difficulties in filling existing job vacancies. Seasonally-adjusted series expressed as moving three-month mean

Source: National Labour Market Board.

Figure 30. Labour supply and employment. Hundreds of persons









Sources: National Institute of Economic Research. Statistics Sweden and the Riksbank. Figure 32. Open unemployment and wage drift. Per cent









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



Figure 34. Corporate sector unit labour costs. Percentage change

Note. Calculated with a moving eight-quarter mean; 2001– 03 forecast by the Riksbank.

Sources: National Institute of Economic Research, Statistics Sweden and the Riksbank. most markedly in just those activities where productivity growth has been highest. Labour productivity growth this year is expected to reach only 0.7 per cent but rates of 1.7 and 2.0 per cent are foreseen in 2002 and 2003, respectively.

Table 7. Labour market forecast in the main scenario.Percentage annual change and per cent

	1999	2000	2001	2002	2003
Nominal hourly wage	3.3	3.6	3.8 (4.1)	3.7 (3.9)	3.7 (3.9)
Labour productivity	1.4	2.1	0.7 (1.1)	1.7 (1.8)	2.0 (1.9)
Unit labour costs	2.2	1.9	3.1 (3.0)	2.0 (2.0)	1.7 (2.0)
Hours worked	2.7	1.5	0.6 (1.1)	0.5 (0.7)	0.9 (1.0)
Open unemployment	5.6	4.7	4.1 (4.2)	4.1 (4.1)	4.0 (3.9)

Note. The figures in parentheses are the assessment in the May Report

Sources: Statistics Sweden and the Riksbank

Moderate wage increases.

The rate of wage increases has been revised downward to some extent throughout the forecast period. Last year's wage rise was 3.6 per cent. The preliminary outcome to date this year is in line with the outcome in the corresponding period last year. But as retroactive wage payments are expected to be somewhat higher this year, the annual wage rise in 2001 is judged to be 3.8 per cent. In both 2002 and 2003 wages are expected to rise 3.7 per cent. The downward revisions are mainly a consequence of the weaker labour market trend. The wage forecasts are based on calculations of existing wage settlements and an assessment of wage drift in relation to the situation in the labour market (Fig. 31).

Negotiated wage increases this year are calculated to average about 3.0 per cent. Around 40,000 employees either do not yet have an agreement or their existing agreement ends this autumn. Next year, agreements are due to be concluded for around half a million employees. It is reasonable to assume that the poorer economic situation will be taken into account in these negotiations. The weaker labour market also tends to subdue wage drift, which is expected to average less than 1.0 per cent this year, around 1.0 per cent in 2002 and 1.3 per cent in 2003. The upward tendency reflects an assumption of some increase in labour demand in the latter part of the forecast period (Fig. 32). The wage assessment points to an improvement in real wages and a broadly unchanged wage share for the total labour market in the coming years (Fig. 33).

Unit labour costs catch the major part of cost pressure in the economy. The co-variation of costs and prices means that under certain circumstances unit labour costs can serve as an alternative indicator of underlying inflationary pressure in a wide sense. The forecast development of unit labour costs has been revised marginally upwards for all three years (Fig. 34). This has to do with the weaker labour productivity trend compared with the assessment in the May Report and the fact that this effect is greater than that from the downward revision of wage increases.

Deregulations, political decisions and transitory effects

The question of insufficient competition in various markets domestic air services and electricity, for example - and how competition law could be strengthened, is currently being studied in a number of public inquiries that are scheduled for completion this autumn. In the report from the inquiry against cartels, the proposals include more effective rules against limiting competition, for example sanctions for unfair competition would be reduced for firms that expose restrictive trade practices.

In the Budget Bill, moreover, the Government has identified other fields for which a review of competitive conditions is planned. All in all, these moves are likely to have certain downward price effects in the coming years.

The Government has proposed a reduction of the property tax on one- and two-family houses, to be implemented retroactively from this year; the CPI effect is about - 0.3 percentage points as of September this year. A retroactive cut in the rate for apartment buildings as of this year is also proposed but as rent negotiations for 2001 have already been completed, the effect on the CPI and UND1X is not expected until next year. Other tax changes that will affect the CPI from the turn of this year include increases in energy taxes and the carbon dioxide tax, as well as lower VAT on books. The net effect of these changes on the CPI is judged to be less than 0.1 percentage point.

The CPI contributions from house mortgage interest expenditure in July and August were somewhat larger that expected earlier, mainly due to the repo rate increase of 0.25 percentage points in July.²⁴ In that the repo rate was cut 0.5 percentage points in September, the contribution from interest expenditure is expected to be somewhat smaller than foreseen in the May Report. All in all, the contribution to CPI inflation from changes in indirect taxes, subsidies and house mortgage interest expenditure is judged to be somewhat smaller than foreseen in the May Report (Table 8).

Table 8. Direct CPI effects from indirect taxes, subsidies and interest expenditure. Percentage points

	Sept. 2001	Sept. 2002	Sept. 2003
Indirect taxes and subsidies	-0.2 (0.0)	0.0 (0.1)	0.1
House mortgage interest expenditure	0.1 (0.1)	0.0 (0.1)	0.2
Total direct effect	-0.1 (0.1)	0.0 (0.1)	0.3

Note. The forecasts in the May Report are shown in parentheses for comparison. This table shows only direct effects of changes to indirect taxes and accordingly it does not include the downward UND1X effect of about 0.2 percentage points in 2002 that stems from the altered property tax on apartment buildings.

Sources: Statistics Sweden and the Riksbank

24 Note that all the calculations start from the technical assumption of an unchanged reporate.

The risk spectrum

The assessment of the uncertainty and the spectrum of risks in the prospects for inflation is presented in this chapter.

The inflation forecast in the main scenario describes the development of prices the Riksbank considers most probable, given the assumption of an unchanged repo rate in the coming twenty-four months. But as the forecast is uncertain, the Inflation Report always includes different alternative paths for inflation. These paths are combined to form a risk spectrum that is of importance for the formation of monetary policy. This applies not least at present in that the situation is unusually uncertain now that economic activity as such is in a phase that makes it difficult to assess. A further complication is the uncertainty about a correction of the saving imbalances and the long-term productivity trend in the United States. The increased unrest arising from the terrorist attacks in the United States and the difficulties in assessing the effects of the ongoing economic policy realignment also contribute.

In the May Report the spectrum of risks for inflation was considered to be balanced in the forecast period. The downside risk associated with international developments was countered by upside risks as regards domestic demand, the relationship between growth and inflation and the path of the exchange rate.

The uncertainty about *international developments* has become even greater during the autumn, not least after the terrorist attacks in the United States (cf. the box on pp. 34-37). International growth has been revised downwards in the main scenario but there are still considered to be appreciable risks of an international slowdown that is more protracted, particularly if there is a general erosion of household and business confidence.

International developments are considered to represent a downside risk for inflation in Sweden that is greater than foreseen in the May Report.

A gradual correction of the saving imbalances in the American economy is incorporated in the main scenario. However, the high debt ratio in the private sector means that firms and households may have reason to increase saving more quickly than the main scenario allows for. Another assumption behind the main scenario is that the potential growth rate of the U.S. economy is around 3 per cent. Trend productivity that is markedly lower than this could mean that demand slackens more appreciably as households and firms adjust and base their decisions about consumption and investment on more realistic perceptions of future income and profits. Investment and consumption propensities may also decline to a greater extent if the attacks and developments in the field of security policy erode confidence in the future. Such a development, together with a faster correction of the saving imbalances, would also have effects on the European and Asian economies, both through traditional trade mechanisms and via stock markets and other financial links.

An increased risk associated with the emerging market economies had already been discerned in the May Report. The increased anxiety in the global economy has now accentuated the financial difficulties, leading to higher interest rates for countries with sizeable budget and current-account deficits. In a number of countries, moreover, domestic demand has slackened and the political situation has deteriorated.

The economic situation in Japan is continuing to worsen as well. Growth has admittedly been revised downwards in the main scenario but the downside risk is still large. The Japanese economy faces a continued weakening even before the numerous structural measures - necessary in themselves but with negative short-run effects on demand - have been implemented or actually approved. This is accompanied by persistently high uncertainty about the financial sector on account of difficulties in assessing reports of bad loans and the valuation of other assets. At the same time, the room for manoeuvre in economic policy is very limited.

A more expansionary realignment of economic policy is now in progress in many countries. Taxes are being cut in a number of countries - the United States in particular but also Italy, Germany, the Netherlands and Sweden - public spending is being increased in others, for example the United Kingdom. In the euro area and Sweden there are also effects from an under-valued exchange rate.

These are some of the forces at work on the future direction of international economic activity. On the one hand there is a more protracted international slowdown, strongly coloured by the rather dramatic revaluation of share prices; on the other are economic policies that are becoming very expansionary. The starting point in the main scenario is that activity turns upwards next year, more or less in line with the normal cyclical pattern. A delayed recovery would affect the Swedish economy via foreign trade, share prices and people's future expectations. In such a situation, the slowdown in Sweden could be prolonged through an unfavourable development of export market share and a more protracted period of weak demand.

All in all, there is considered to be a sizeable risk of weaker economic activity, due above all to problems in the international economy. This downside risk for inflation in Sweden is somewhat greater than at the time of the May Report.

The main risk on the upside is that inflation in Sweden will be higher than in the main scenario despite the ongoing economic slowdown. During the spring, inflation rose more than had been expected; in the May Report this was largely attributed to transitory factors. For example, food prices rose as a consequence of mad cow disease and foot-and-mouth disease. Electricity and telecom prices also rose for reasons that did not seem to be connected with the general demand situation.

The upside risks associated with the relationship between growth and inflation are judged to be somewhat greater than at the time of the May Report.

Rising prices when demand is weakening raise questions about resource utilisation and its impact on inflation. The Riksbank's assessments in this field are reviewed continuously in the light of new information. Some under-estimation of resource utilisation is conceivable, although this is gainsaid by the lower wage increases, for example. An underlying explanation could be that the drop in inflation 1998-2000 came, to a greater extent than calculated, from transitory effects of increased competition arising from deregulation, increased trade and so on. Although the inflation assessment in the main scenario is coloured by concern about inflation being somewhat higher at unchanged resource utilisation, there is still considered to be a risk of somewhat higher inflation stemming from the *relationship between growth and inflation* in a wide sense in the Swedish economy.

The *exchange rate* has continued to weaken since the time of the May Report. The main scenario incorporates an appreciation of the krona that gradually approaches more reasonable levels. This follows in the wake of stronger economic activity, more stable stock markets and so on. The main risk of the krona remaining weak lies in the international picture. The inflationary effects in such a scenario would be comparatively small, at least as long as inflation expectations are not upset. It is conceivable, however, that even if international developments follow the main scenario, the appreciation foreseen there will be further delayed. In such a scenario there is a risk of a weak exchange rate having more appreciable effects on inflation in Sweden.

The upside risk associated with the path of the krona is judged to be somewhat greater than at the time of the May Report.

All in all, the downside risk associated with international developments is balanced by the upside risks from the exchange rate and the relationship between growth and inflation. Thus, the probability of inflation being higher than in the main scenario matches that of lower inflation. This is evident from Fig. 35, which presents the uncertainty around the forecast of underlying inflation, measured as the 12-month change in UND1X. As the risk spectrum is balanced, the uncertainty intervals on either side of the forecast path in the main scenario are symmetric.²⁵ The spectrum of risks in the forecast of CPI inflation is also balanced (Fig. 36).

The uncertainty in the assessment of both underlying and CPI

Figure 35. UND1X with uncertainty intervals. Percentage 12-month change



Sept. 96 Sept. 97 Sept. 98 Sept. 99 Sept. 00 Sept. 01 Sept. 02 Sept. 03

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.

²⁵ For an account of how the uncertainty interval is derived, see Blix, M. & Sellin, P. (1999), Inflation forecasts with uncertainty intervals, *Quarterly Review 2*, Sveriges Riksbank; for a fuller analysis, more focused on models, see *idem* (1999), *Uncertainty bands for inflation forecasts*, Sveriges Riksbank Working Paper 65.

Figure 36. CPI with uncertainty intervals. Percentage 12-month change



Sept. 96 Sept. 97 Sept. 98 Sept. 99 Sept. 00 Sept. 01 Sept. 02 Sept. 03

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.

inflation is greater than usual and exceeds the perceived uncertainty at the time of the May Report.

All in all, the spectrum of risks for UND1X as well as CPI inflation is considered to be balanced both one and two years ahead.

As monetary policy decisions are based primarily on an assessment of price tendencies twelve to twenty-four months ahead, it is the inflation prospects for this time horizon that are particularly relevant. In the main scenario, the rate of inflation measured as the 12-month change in UND1X is expected to be 1.7 per cent in September 2002 and 2.0 per cent in September 2003. As the risk spectrum is balanced, the mean value of the alternative assessments of UND1X inflation coincides the assessment in the main scenario. Similarly, the risk-adjusted assessment of CPI inflation coincides with the assessment in the main scenario, with a mean value of 1.5 per cent one year ahead and 2.1 per cent after two years (Table 9).

Table 9. Inflation forecasts including the risk spectrum. Per cent

	Annual rate		12-month rate
	2001	2002	Sept. 2002 Sept. 2003
CPI	2.6	2.0	1.5 2.1
UND1X	2.8	2.4	1.7 2.0

Note. The table gives the mean values of the inflation assessment's probability distributions (see Figs. 35 and 36).

Source: The Riksbank.

Table 10. UND1X inflation.

Percentage probability, 12-month rate

	UND1X<1	$1 \leq UND1X < 2$	$2 \leq UND1X \leq 3$	UND1X>3	Total
2002 (September)	20	44	30	6	100
2003 (September)	23	27	27	23	100

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

Source: The Riksbank.

Table 11. CPI inflation.

Percentage probability, 12-month rate

	CPI<1	1≤CPI<2	2≤CPI≤3	CPI>3	Total
2002 (September)	29	45	23	3	100
2003 (September)	21	26	27	26	100

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

Source: The Riksbank

The conclusion from the assessments presented here is that, given an unchanged repo rate of 3.75 per cent and excluding changes in indirect taxes, subsidies and interest rates, inflation in the main scenario, as well as with the risk spectrum taken into account, will be somewhat below the 2 per cent target one year ahead but in line with the target after two years. The uncertainty in the forecasts of future UND1X as well as CPI inflation is considered to be greater than normal and also greater than at the time of the May Report.