

Monetary policy in Sweden since 1992

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Introduction

This paper deals mainly with the floating exchange rate regime that was introduced in November 1992 after the collapse of the fixed exchange rate regime. During the last decades of the fixed exchange rate regime, rising wages accompanied by an accommodating exchange rate policy contributed to high inflation. In the late 1980s the Swedish economy became overheated. Given the fixed exchange rate regime, monetary policy was tied to the mast. At the same time, loose fiscal policy, deregulation of the financial markets and a tax system that encouraged debt-financed consumption spurred aggregate demand and increased asset prices. Inflation rose sharply. The household saving ratio became negative and unemployment fell as far as to 1.4% in 1989.

After 1990 a quickly deepening recession set in. The combination of an international recession, a reformed tax system which encouraged net savings, abolished investment allowances and falling asset prices contributed to the severity of the downturn. There was a rapid decrease in economic activity and employment. Inflation fell from 10% in 1990 to 2% in 1992. In the meantime the overvalued krona led to devaluation expectations. As a result after-tax real interest rates rose rapidly which contributed to the recession. Moreover, after the collapse of asset prices large parts of the Swedish banking system experienced perhaps the worst crisis of this century. The immediate effect of the decision to allow the krona to float in November 1992 was a depreciation of about 10% of the effective exchange rate.

The purpose of this paper is to review the Swedish experiences with conducting monetary policy with a flexible exchange rate regime and inflation targeting. The paper is organised as follows. Section 1 discusses different choices when formulating objectives and rules for monetary

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policy. It also describes the monetary policy framework in Sweden. Section 2 focuses on economic developments and the responses of monetary policy; it is divided into three subsections, based on phases of the monetary policy stance: November 1992–July 1994, August 1994–December 1995 and January 1996–March 1997 while a fourth subsection discusses the communication of monetary policy intentions to the market. Section 3 addresses some current issues regarding monetary policy; the last section concludes.

1. Objectives and implementation of monetary policy

This section is divided in two parts. The first discusses different objectives for monetary policy and the arguments supporting the introduction of the Riksbank's inflation target. The second part describes the conduct of monetary policy in Sweden, i.e. the implementation of policy, inflation forecasts and the instruments used to achieve the final objective.

The transition to a flexible exchange rate regime in November 1992 implied new conditions for monetary policy. In a fixed exchange rate regime with price stability as the objective, the intermediate target for monetary policy is the exchange rate. The central bank has to bring the cross-border flow of foreign currency into balance to support the fixed exchange rate. Imbalances in this flow force the central bank to adjust the level of interest rates (or counteract the flows by short-run currency interventions). In a floating exchange rate regime monetary policy may adopt some other intermediate target as an anchor or focus directly on the ultimate objective of low and stable inflation.

In 1992 the credibility of fiscal and monetary policy was low. Sweden experienced the worst recession since the 1930s. The large Government debt and budget deficit, together with a high degree of international capital mobility, made Sweden extremely vulnerable to financial crises. Hence it was important to improve the credibility of monetary policy. Against this background the Riksbank formulated a new policy framework.

The inflation target

In January 1993, the Governing Board of the Riksbank announced an inflation target that would apply from 1995. The target was to limit the

twelve-month increase in the consumer price index to 2%, with a tolerance interval of plus and minus one percentage point. There were several reasons for specifying a lead time of two years. Monetary policy began to operate in a different environment from that of the fixed exchange rate regime. The Riksbank also needed more experience and knowledge for a full understanding of the new situation. Furthermore, monetary policy achieves its full effect on inflation with a lag of one to two years. Finally it was not desirable to entirely counteract the effects of the krona's initial depreciation, despite inflationary pressures from import prices. Before the target became operative, monetary policy focused on preventing the underlying rate of inflation¹ from rising.

In 1992, inflation in Sweden had fallen to historically very low rates of about two per cent (measured as the twelve-month change in the CPI). By early 1993, when the inflation target was adopted, inflation had risen. This was mainly the result of increasing import prices after the sharp depreciation of the krona and higher indirect taxes. Payroll taxes were also lowered in 1993, which to some extent dampened the effects of the weaker exchange rate. Underlying inflation was judged to be about two per cent. Thus, the chances of meeting a target that was relatively ambitious by the standards of Sweden's past inflation performance were considered good.

Final versus intermediate targets

The Riksbank decided to use an explicit final objective instead of some explicit intermediate objective such as a monetary aggregate. A money-supply target presupposes a stable relationship between money supply and macroeconomic variables including nominal GDP or inflation. Such a relationship does not always exist. Furthermore, there is a conflict between different types of monetary aggregates. Narrow monetary aggregates tend to be easier to control but may be only weakly correlated with the final objective, while broader aggregates are more difficult to control but have a higher correlation with the final objective.² In addition, if price stability remains the final objective, the central bank's inflation forecast may be a better intermediate target than money supply. In theory, under certain conditions, the inflation forecast becomes an ideal intermediate

¹ The initial effects of the depreciation are excluded from the measures of underlying inflation used by the Riksbank.

² Andersson and Berg (1995).

target, in that it is the current variable most correlated with the goal and is easier to control than the goal.³ Inflation targeting is more efficient, in the sense of bringing lower inflation variability, than money growth targeting. Even in the exceptional case when money supply contains all current information about inflation, monetary policy becomes less direct and less transparent compared with an inflation target. In practice, however, differences between inflation and monetary targeting are smaller than would appear on the surface as the final objective of monetary policy is price stability.

An inflation target also provides an opportunity to assess ex post the performance of monetary policy by comparing actual inflation with the inflation target. In addition, inflation targeting provides an efficient monitoring of monetary policy by the public if the central bank publishes and allows public scrutiny of its inflation projections. Inflation expectations relative to the inflation target may also be interpreted as indicators of the credibility of monetary policy.⁴

Headline or underlying inflation

The Swedish inflation target is expressed in terms of the consumer price index (headline inflation). The CPI has several advantages for this purpose; it is familiar to the public, is published on a monthly basis without long lags and is seldom subject to revisions. Compared to an underlying inflation target, a headline inflation target makes monetary policy more transparent.

Initially, a measure of underlying inflation as the target was seen as an alternative. However, besides the disadvantage that measures of underlying inflation are less familiar to the public, underlying inflation is difficult to measure accurately. Furthermore, it is hard to estimate the effects of indirect taxes and subsidies on underlying inflation. Usually underlying inflation is adjusted for the full effect of a change in indirect taxes and subsidies. However, the actual impact of changes in taxes and subsidies varies over time.

On the other hand, an important limitation of headline inflation is its susceptibility to specific one-off disturbances that are unrelated to the inflationary process. Various measures of underlying inflation are therefore used as important indicators of current inflation pressures in the

³ Svensson (1996).

⁴ Svensson (1996).

economy. Such measures exclude some sub-component price series that are felt to distort the headline inflation index. Usually mortgage interest costs are eliminated in order to prevent perverse monetary policy reactions. Other exclusions in measures of underlying inflation are energy, food and import prices. The reason for omitting these components is to obtain a measure that corresponds to the prices that monetary policy may control. Measures of underlying inflation may also be used to explain why headline inflation is outside the interval of the inflation target due to unforeseen circumstances, such as sudden changes in oil prices.

Monetary policy in practice

The monetary policy framework in Sweden contains four elements:

1. The inflation target;
2. The Riksbank's inflation forecast;
3. The operational targets, i.e. the repo rate, borrowing rate and lending rate;
4. The instruments directly controlled by the Riksbank, i.e. the portfolio and the terms of credit facilities. The portfolio consists of interest bearing securities in local currency used to manage liquidity in the banking system (along with the terms of credit facilities) and foreign exchange reserves, which are used for interventions.

The inflation target

Monetary policy affects aggregate demand and inflation with a lag of about 1–2 years in Sweden.⁵ Hence, the first step for monetary policy is to make a forecast of inflation 1–2 years ahead. The Riksbank makes forecasts about inflation four times a year and monetary policy scenarios at least eight times a year.

The forecast is made conditional on the current state of the monetary policy instruments and is based on all other information considered relevant. The Riksbank uses a range of indicators as inputs in the forecast. The indicators contain information about inflation for different time horizons. Different price measures – CPI, underlying inflation, GDP-deflator, etc. – monitor immediate inflationary pressures. Near-time inflation indicators are output gaps, capacity utilisation, and prevailing unemployment. For a time horizon up to a year, wages, import prices and exchange rate

⁵ See Hansson (1993).

movements appear to be important inflation indicators. For a time horizon of one to two years monetary aggregates, medium-term interest rates and surveys of inflation expectations are monitored. For periods of more than two years, the main indicators consist of interest rates, forward interest rates and econometric projections. Given the information from these indicators, the Riksbank can make forecasts of the path for future inflation. The next step is to determine a path for the instruments, a monetary policy scenario, so that the forecast matches the target at a one-to-two-year horizon. Thus, the inflation forecast can be interpreted as an intermediate target.⁶ The instruments affect the demand in the economy through the transmission mechanism. This includes interest rate effects, other asset price effects, exchange rate effects, and the so-called credit channel.⁷

As actual inflation is influenced by factors outside the control of monetary policy, it will differ from the inflation target. For instance, with a control lag of two years, unforeseen occurrences within that period affect inflation but are outside the control of the central bank. Forecast errors also cause discrepancies between the inflation target and actual inflation. Furthermore it is not always desirable to bring the inflation rate towards the target as fast as the control lag permits. For instance, supply-oriented disturbance introduces a conflict between output and price stability. A monetary response to retain price stability would lead to further destabilisation of output. Likewise, changes in indirect taxes, which have one-off effects on the CPI, may destabilise output if monetary policy counteracts the fiscal measure. Thus, a policy that tries to return inflation immediately to the target might introduce excessive output variability. Variations in the inflation forecast may be accommodated within the tolerance interval of the inflation target, *ex ante*, but only if the fiscal measure is known well in advance or is small. Normally, changes in taxes and subsidies would be absorbed within the target range. However, in the event of major changes, for instance in connection with a tax reform, there has to be latitude to allow the effects to pass through into prices, even to the point of exceeding the inflation target. Obviously, the direct effects on the inflation rate will be temporary, since these effects will fall out of the twelve-month rates of increase a year later. A gradual adjustment of inflation and the inflation forecast thus requires that monetary policy is

⁶ See Svensson (1996).

⁷ See Hörngren (1995).

credible. It is important, however, that such events are prevented from affecting inflationary expectations and thereby producing lasting effects on the rate of inflation. The Riksbank has clarified that it will conduct monetary policy to this end.

Monetary tactics

The next step in the framework of monetary policy is to implement the policy. Monetary tactics concern the first phase in the transmission mechanism – the Riksbank's interaction with the financial market – and include the choice of instruments, how to use the instruments to reach operational targets and principles for communication with the market.

Monetary instruments

The new flexible exchange rate regime and the introduction of the inflation target altered the conditions for interest rate management by the Riksbank. Without any explicit intermediate target, monetary policy is in a position to act directly on demand and inflation expectations and thereby on inflationary pressures. Hence, there is a greater need for nuances in monetary policy signalling and for possibilities of flexible adjustments of interest rates. Sweden is a small open economy with deregulated and integrated financial markets. Together with Sweden's inflation history this has accentuated the need for a more flexible interest management system – a system that influences money market interest rates as intended, without putting inflation credibility at risk. Furthermore, the introduction of an explicit inflation target especially raised the need for tools signalling long-term monetary policy intentions so as to attain transparency.

In the light of these considerations, the Riksbank introduced a new interest management system in June 1994. In the earlier system, the interest rate on lending and deposit facilities took the form of an ascending scale, whereby a bank's marginal cost increased with the amount borrowed from the Riksbank. The highest step at which a bank borrowed was known as the marginal rate. The system restricted the desired signalling flexibility by not admitting interest rate adjustments smaller than 0.25 percentage points and by the complete focus on the marginal rate.

The new system consists of one deposit and one lending facility, with corresponding deposit and lending rates used by the Governing Board of

the Riksbank mainly to signal monetary policy in the somewhat longer run. The deposit and lending rates form a “corridor” in which the repo rate – the Riksbank’s primary operational target and signalling rate – is set by the Governor in accordance with monetary policy guidelines established by the Governing Board. The combination of an interest corridor signalling the future direction and speed of interest rate adjustments and a repo rate provides a flexible system for monetary implementation.

The repo rate is the rate at which, as a means of managing the liquidity of the banking system, securities with a maturity of one week are bought or sold by the Riksbank under repurchase agreements. The fixed repo rate may be interpreted as the Riksbank’s target for the overnight rate in the interbank market. The repo rate can also be variable and set by tender, but this procedure was only used on a few occasions in the spring of 1995.

In February 1995, the Riksbank used a variable repo rate for the first time on the grounds that a variable repo rate was thought to provide more flexibility for the instrument rate to be adjusted in smaller steps according to changes relevant to monetary policy. Another reason was the assessment that market expectations of monetary policy were in line with the Riksbank’s intentions. The krona was weak at the time and the market expected short-term interest rates to rise. The problem was that the bids did not only mirror monetary policy expectations, but rather the fact that the overnight rate had been lower than the repo rate for some time due to a liquidity surplus (not absorbed by the Riksbank) in the banking system as a whole.⁸ Judging from the bids, some market participants expected this to prevail and the bids came in low. The Riksbank’s response was to disregard low interest rate bids. The last time the Riksbank used a variable repo rate – in March – the opposite problem occurred. The Riksbank had guided liquidity in the banking system to a deficit, which resulted in an overnight rate above the repo rate. Again, overnight market considerations affected the bids. The interest bids came in high – which also reflected an expected monetary tightening as the krona had weakened during February – and the Riksbank had to disregard high interest rate bids to prevent a very high repo rate from being established. Still, the highest bid accepted by the Riksbank was not quite in line

⁸ In the spring of 1995, the Riksbank did not fine-tune liquidity in the interbank market, thus allowing the overnight rate to fluctuate according to market conditions. The target rate was rather market rates with the same maturity as the repo rate, at that time primarily two weeks.

with the monetary policy intentions and was well above market expectations. During this period the credibility of fiscal policy was insufficient and international financial markets were characterised by unrest. Consequently, variable repos were not suitable during this period. All in all, market reactions caused volatility at the short end of the yield curve, partly due to the uncertainty of the Riksbank's intentions.

With hindsight, variable repo rates cannot be used to provide a clear signal of the Riksbank's intentions. Therefore, for variable repos to function well, a stable environment with sufficient confidence in economic policy and a strong link between the repo rate and the overnight rate are necessary. On the other hand, there are other means, for example overnight forward rate curves, that yield information about market expectations. In the light of these experiences, the Riksbank has used a fixed repo rate since March 1995.

During the repo period, the banking system has only two alternatives: use the Riksbank's facilities to borrow (deposit) any liquidity deficit (surplus) or adjust the demand for bank notes.⁹ As demand for bank notes is insensitive to interest rate changes in the short run, an unexpected shift in demand for borrowed reserves immediately places the banking system in the borrowing (deposit) facility. Hence, as the banks' marginal cost is affected, the overnight rate rises (falls) inside the interest corridor (Figure 1).

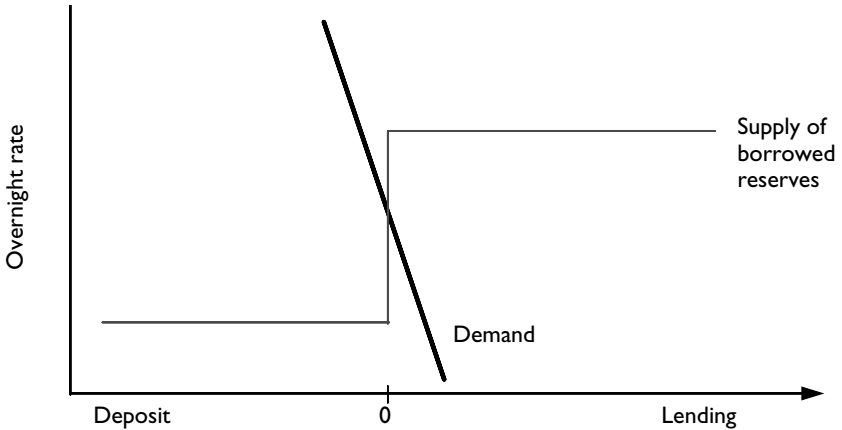
Currently, the Riksbank fine-tunes liquidity in order to neutralise changes in the banks' need to utilise the borrowing (deposit) facility during the repo period.¹⁰ The Riksbank intervenes in the interbank market to fine-tune the overnight rate close to the repo rate.¹¹ The Riksbank made these moves towards clearer signalling mainly to avoid

⁹ The reserve requirement was set to zero as of April 1994. This was a natural step towards a more market conform monetary policy as other monetary policy instruments provide more flexibility without distorting competition. A reserve requirement based on the average over a stipulated period (as in some EU countries) provides the banking system with a third alternative to manage short liquidity positions. The banks are free to use the reserves during the period, for example to meet overnight liquidity shortages, as long as the reserve requirement is met on average over the period. This might help to avoid undesirable fluctuations in the overnight rate and reduces the need for frequent market interventions.

¹⁰ The Swedish interbank market is dominated by a few large banks, which simplifies the Riksbank's estimates of the banking systems' net position in the standing facilities over the coming week. Liquidity positions can easily be monitored on a continuous basis. Hence, fine-tuning operations in the deposit market present no problem to the Riksbank.

¹¹ To provide the banks with an incentive to bid in the weekly repos the Riksbank fine-tunes liquidity using the repo rate plus/minus 10 basis points.

Figure 1
The interest rate corridor



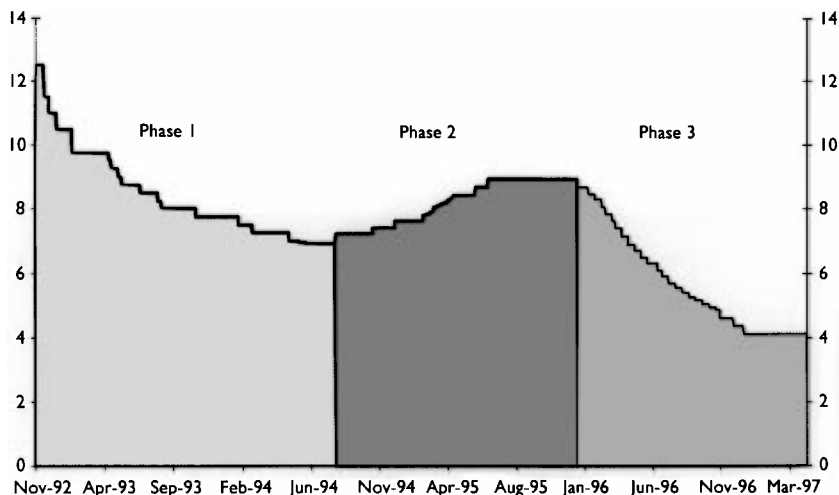
financial market participants mistakenly interpret fluctuations in the overnight rate during the life of the repo as monetary policy signals.¹² The fine-tuning implies that the banking system as a whole encounters a marginal net borrowing cost that equals the repo rate, with the result the overnight rate is established on the same level. By managing the overnight rate the Riksbank exerts an essential influence on the short and medium-term rates in the money market. In efficient markets these rates are mainly governed by the expected overnight rate. Furthermore, comparing market's expectations of the future overnight rate with monetary policy intentions provides important information about expectations of monetary policy.

2. Economic development and monetary policy – three phases

The purpose of this section is to describe the Riksbank's monetary policy formulation in the light of the important developments in the real economy as well as in the financial environment that occurred following the transition to a flexible exchange rate regime in November 1992. The

¹² Caused by a shift in liquidity, for instance due to changes in the foreign exchange reserves during the life of the repo.

Figure 2
Riksbank instrumental rate
 In per cent



section is divided into four subsections related to differences in monetary policy and economic development (Figure 2): (i) export-led recovery and easing of monetary policy: November 1992–summer 1994; (ii) increasing capacity utilisation and a tightening of monetary policy: August 1994–December 1995; and (iii) new conditions for monetary policy: January 1996–spring 1997 (monetary easing). Each phase begins with a description of important considerations behind the monetary policy formulation, followed by a short review of the real economic and financial developments. The fourth subsection discusses the role of market communication during these three phases.

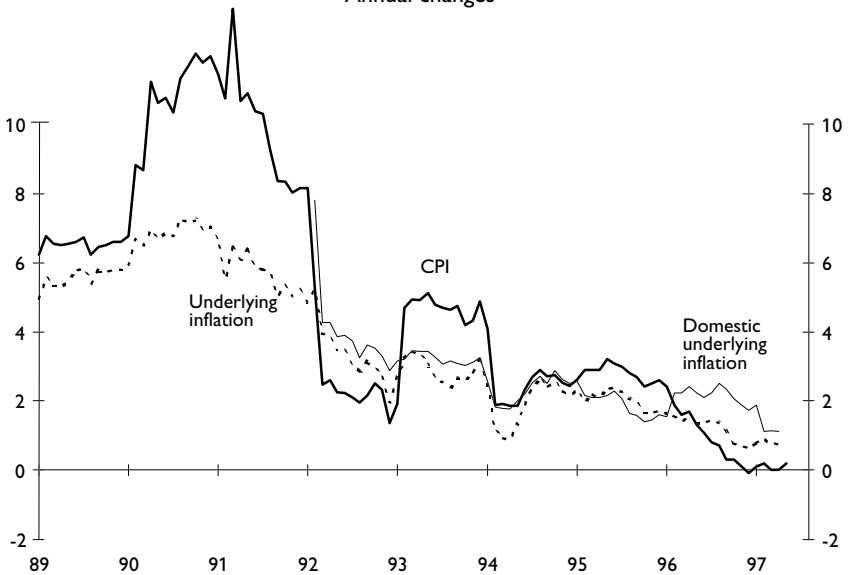
*(i) Export-led recovery and easing of monetary policy:
 November 1992–summer 1994*

After an immediate depreciation of about 10% in 1992, the krona continued to weaken during the beginning of 1993. An upward movement in the long bond rate in January suggested that long-term inflation expectations were rising. In January and February the Riksbank intervened in the foreign exchange market for the first time during the floating exchange rate regime in an attempt to counteract the inflationary effects

Figure 3
Capacity utilisation
 In per cent



Figure 4
CPI and underlying inflation
 Annual changes



of the weakening of the krona. The interventions in the course of 1993 totalled about SKr 55 billion. The exchange rate was also affected by Swedish firms, reducing their foreign currency exposure. Expectations of a further depreciation and the structural need for debt reduction in the private sector led to massive outflows of capital as the private sector rapidly reduced foreign debt. The government borrowing requirement was partly financed by borrowing in foreign currency. For 1993 these loans totalled about SKr 80 billion. In this way, part of the private sector's earlier exposure to exchange rate risks was taken over by the Government. Some of the increased borrowing was also used to build up the foreign exchange reserves.

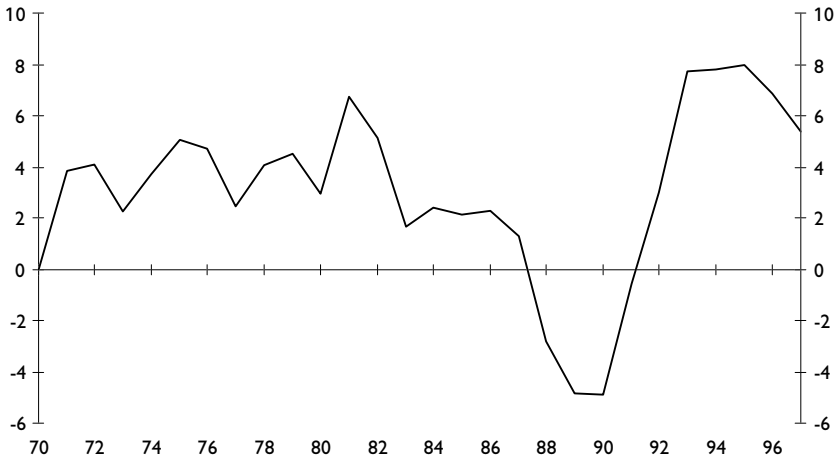
Dual situation in the economy

From November 1992 to June 1994 the Riksbank lowered the interest rate more than 5½ percentage points to 6.92%. Growing signs of a dual economy were evident in Sweden during that period. The Swedish competitive position strengthened markedly, not only due to the depreciation of the krona. In 1992 payroll charges were reduced by 4.3 percentage points.¹³ Increased productivity and low wage increases also contributed to the improvement in the competitive position. Interestingly, productivity started to increase in 1991 and especially in 1992, i.e. before the depreciation of the krona. This is in contrast to the situation in the eighties, when productivity started to grow more than one year after the devaluation in 1982.

Despite the recovery in industrial production for exports, investment in manufacturing continued to fall during 1993 for the fourth consecutive year. Consumption, private as well as public, was weak and the household saving ratio remained high (Figure 5). Inflation rose in the beginning of 1993, mainly due to increased indirect taxes and, to some extent, rising import prices. Weak domestic demand was one of the reasons why the depreciation did not have a greater impact on consumer prices. It was against the background of low economic activity, debt consolidation and increased private saving that the Riksbank considered it possible to reduce the interest rate, without fuelling uncertainty and a weaker exchange rate.

¹³ Two crises packages were presented jointly by the Government and the Social Democrat opposition during the autumn of 1992 in order to defend the fixed exchange rate. The first package included proposals for reducing the budget deficit by more than SKr 40 billion. The second package was a fully financed proposal to cut payroll charges.

Figure 5
Household saving ratio*
 In per cent



* Net saving in relation to disposable income.

Source: Statistics Sweden.

The tactics during the monetary easing in 1993 and early 1994 were to lower the marginal rate gradually. The Riksbank's view was that fast and sizeable adjustments of the marginal interest rate might cause inflation expectations to rise, especially in the light of Sweden's history of inflation and weak budget discipline, and thus cause long bond rates to rise. An exception was the quite large cut – 75 basis points – of the marginal rate in February 1993, which might serve as an example of the signalling effect of a sizeable step (even though long bond rates did not rise). Short-term market rates fell markedly, indicating that the financial market was expecting the Riksbank to cut rates more aggressively, and the krona weakened. This led the Riksbank to intervene in the money market. Short rates moved back up while long rates fell and the krona strengthened.

A problem facing the Riksbank was that the monetary easing might contribute to further depreciation of the krona and thus aggravate the dual situation in the Swedish economy, even though the depreciation of the krona mainly reflected increased risk premia as uncertainty about long-term fiscal stability rose. The central government budget deficit in relation to GDP totalled –15.2% in 1993 and public sector gross debt

amounted to 76.0%.¹⁴ Even though actual inflation was in line with the Riksbank's intentions, the serious imbalances in public sector finances, along with Sweden's inflation history, aroused fears of increasing inflation expectations. Hence, there was a risk that the Riksbank would fail to meet its inflation target. The Riksbank, therefore, stressed the need for a forceful budget consolidation, especially considering the high gross debt ratio, both historically and internationally. The fiscal problems affected the exchange rate and by December 1993 the krona had depreciated by nearly 25% in effective terms since November 1992.

During the first half of 1993, the domestic debate on monetary policy was intense. Several commentators urged the Riksbank to pursue a more expansionary monetary policy than it did. The monetary policy implemented in Finland and the United Kingdom at the time was seen to be more in line with what a depressed domestic economy like the Swedish needed. However, in terms of a monetary conditions index, weighting together the stimulative effects from both the real interest rate and the real exchange rate, policy had already turned expansionary. Thus, while monetary conditions in the United Kingdom and Finland between September 1992 and June 1993 became 5 and 10 percentage points more expansionary, respectively, they became 12 percentage points more expansionary in Sweden.¹⁵ Another difference, however, between Sweden and Finland and the United Kingdom was the stance of fiscal policy in 1993. While the structural general balance in Sweden was calculated to be -11% of GDP, the structural deficit was -0.2% of GDP in Finland and -5% of GDP in United Kingdom, according to the OECD.¹⁶ One observer, who supported the Riksbank's policy during the spring of 1993, concluded later: "With hindsight, experience and credibility, all of which were obviously lacking (for very different reasons!), it is possible that the best policy would have been more expansion during the spring of 1993 and, less expansion during the fall of 1993 and spring of 1994. However, without credibility, the Riksbank's freedom of movement was less, and a more expansionary policy during the spring of 1993 might have been

¹⁴ Source: National Institute of Economic Research.

¹⁵ For Sweden, the change in the monetary conditions index refers to the period between November 1992 (when the krona started to float) and June 1993. The monetary conditions for all countries use relative weights of 3 to 1 for real short-term interest rates and the real effective exchange rate. Between the move to flexible exchange rates and June 1993, the exchange rate (TCW) depreciated 9, 7 and 16%, respectively, in the United Kingdom, Finland and Sweden.

¹⁶ OECD *Economic Outlook*, December 1993.

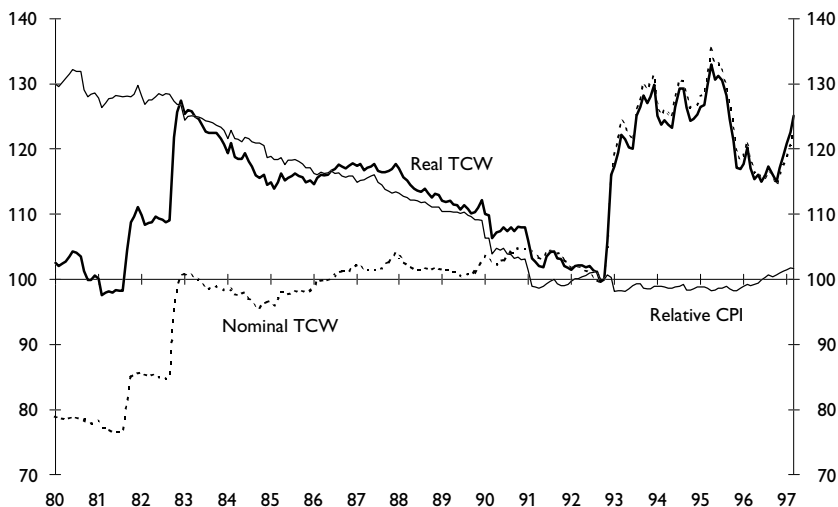
interpreted as the beginning of a new era of high inflation, hence tending to increased inflation expectations, and starting to increase actual inflation.”¹⁷

Excessive depreciation

Part of the real depreciation in 1993 can be seen as an adjustment process towards long run equilibrium after the real appreciation during the 1980s and early 1990s (Figure 6). But the real depreciation seems to have been excessive, especially as the competitive situation for Swedish firms reached historically high levels. By the end of 1993 the improvement in relative unit labour costs in a common currency amounted to between 8 and 10% compared with eleven years earlier after the competitive devaluation of the krona in 1982. Hence, the real depreciation seemed to have more than compensated for the earlier real appreciation.

But part of the depreciation was related to low credibility and fears of a regime shift reflecting imbalances in public sector finances. There was

Figure 6
Real exchange rate, relative CPI and nominal exchange rate
 Index, October 1992 = 100



¹⁷ Svensson (1995).

still a long way to go in bringing long-term inflation expectations down, even though the transition from high to low inflation in the economy went very fast.¹⁸

Furthermore, the real depreciation of the krona can to some extent be related to the confidence – in the late 1980s and early 1990s – in the fixed exchange rate regime, even though the real appreciation and other indicators showed signs of serious problems in the Swedish economy. For example, to be profitable, the increase in foreign debt by Swedish firms, partly explained by interest arbitrage opportunities, was heavily dependent on the credibility of the fixed exchange rate regime. In 1993, Swedish firms amortised SKr 98 billion, or 6.7% of GDP, on foreign debt. The major factor behind the Swedish companies' foreign currency debt in 1992 was the persistent current account deficits during the 1980s and early 1990s – the result of an overheated economy with structural wage formation problems – which had to be financed.

The Swedish private sector had to finance the current account deficits on its own as the rule, valid from 1984 to 1992, that the government should not increase its borrowing in foreign currency prevented any public financing. The rule aimed to strengthen the commitment to the fixed exchange rate regime.¹⁹ Hence, given that the government did not finance the current account deficit, the interest rate differences had to be high enough to stimulate inflows of private sector capital.

The speculative bubble

Foreign investors influenced the interest rate markedly during 1993 and 1994.²⁰ They increased their holdings of Swedish long-term bonds by SKr 133 billion (9.2% of GDP) from November 1992 to January 1994, mainly in order to speculate in falling long bond rates in the short term.²¹ A large part of these acquisitions of Swedish long bonds was repo financed,²² which protected the investors against the currency expo-

¹⁸ We are not referring to long-term inflation propensity in the economy, but to the short-term evidence.

¹⁹ Hörngren and Westman-Mårtensson (1991).

²⁰ Some of the facts discussed in this section were not evident to policymakers in the autumn of 1993 and early 1994.

²¹ Sweden was not the only country with speculative trade during 1993 and the beginning of 1994. Large speculative funds invested heavily in countries like Italy and Spain on expectations of falling long bond rates.

²² Short-term borrowing using the security as collateral.

sure.²³ By January 1994, foreign investors had built up a repo stock of SKr 70 billion (4.6% of GDP).²⁴ Speculation in falling long bond rates might have been triggered by the fall in international interest rates, an expected monetary easing in Sweden and – to some extent – falling inflation expectations²⁵ in the short to medium term.

Probably most important was the high initial level of interest rates, which was due to Sweden's history of inflation and weak budget discipline. Traditionally high interest rates implied a large potential drop in long bond rates as a response to changes in economic conditions, like the fall in international interest rates. Together with short investment horizons and repo financed holdings, this presented a large potential profit for the investors. Furthermore, the recession, with few signs of inflation and indications of falling inflation expectations, might have led investors to expect monetary easing. Given no inflation risks in the short run, the easing of monetary policy might have contributed to the fall in long bond rates. The reason being that monetary easing lowers the cost of financing the holding of long bonds, thereby increasing demand for long bonds and causing long bond rates to fall (all else equal). Hence, the speculative demand for long bonds, which was probably accentuated by a tendency of herd behaviour, was an important factor behind the fall in long bond rates from 10% in the beginning of 1993 to 7% by year-end, a level (at the time) not seen since the 1960s.

Short investment horizons and high leverage made investors very sensitive to changes in long bond rates. As a consequence, when world interest rates rose after the monetary tightening by the US Federal Reserve Board in February 1994, the reaction was to sell Swedish long bonds quickly, causing Swedish long interest rates to rise significantly.

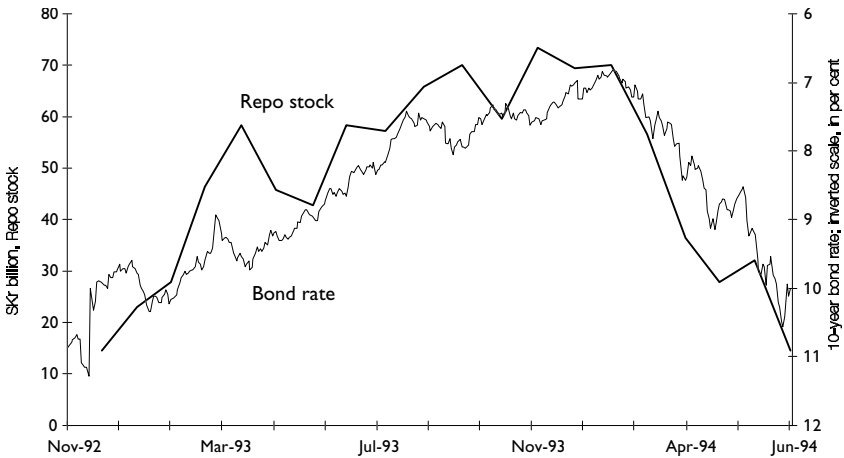
Thus, the fall in long bond rates in 1993, and especially the fall by 130 basis points in the 10-year bond rate differential vis-à-vis Germany, was probably to a large extent the result of short-term speculation. In this

²³ To some extent this might explain why the krona remained relatively stable during the international turmoil in the spring 1994 when both long bond rates and the long bond rate differential vis-à-vis Germany rose sharply.

²⁴ Foreign investors' total interest rate exposures were even higher than the repo statistics account for. The investors also used interest derivatives (swaps and futures) to obtain speculative interest rate exposures in Sweden.

²⁵ As indicated by Aragon Securities' survey among investors in the Swedish bond market and the downward shift in implicit forward rate curves. Given unchanged real interest rates (and adjusted risk premia) this implies falling inflation expectations. But at the same time the steepenings of implicit forward rate curves during 1993 implied increasing inflation expectations in the long term.

Figure 7
Long bond rate and foreign investors' repo financed holdings of government bonds



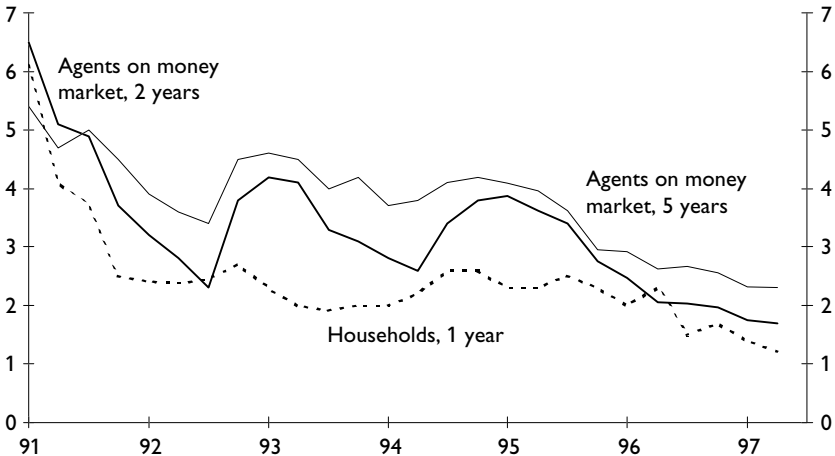
way, the speculation in Swedish securities had implications both for the appropriate interpretation of the long bond rate differential vis-à-vis Germany as an indicator of long-term credibility and for the response of long bond rates to the hike in international interest rates in February 1994. One conclusion is that, long-term interest rates, in periods with financial unrest, may be blurred indicators for monetary policy.

*(ii) Increasing capacity utilisation and tightening of monetary policy:
 August 1994 – December 1995*

During the spring and summer of 1994 inflation pressure increased. The annual change in the CPI rose to 3.3% in April and was followed by a further increase in prices of imported goods. Inflation expectations two years ahead rose from 2.6 to 3.4% between May and August (Figure 8). In the meantime industrial capacity utilisation rose above 80%, comparable to the level during the late 1980s (Figure 3).

This partly reflected the low investment level in the preceding years, with negative implications for the expansion of production capacity. Furthermore, the exchange rate continued to weaken. The rise in inflation pressure in 1994 also made it clear that price formation was still

Figure 8
Inflation expectations
 In per cent



Sources: Statistics Sweden and Aragon Securities.

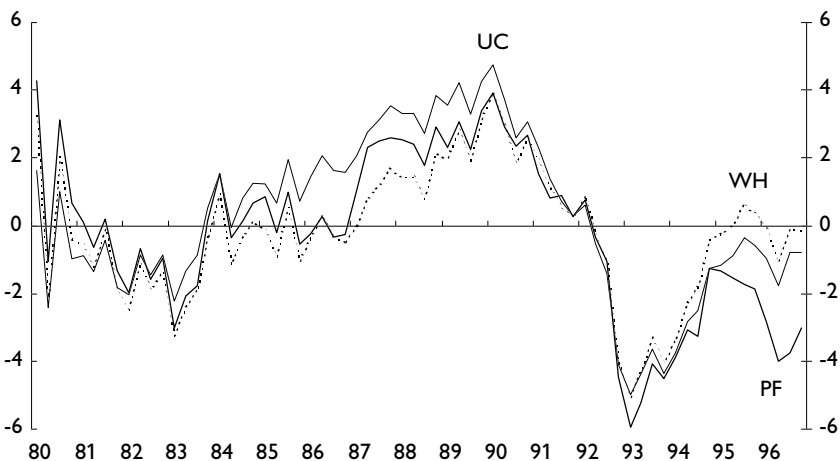
not in line with a low inflation economy. Therefore, in August 1994 the Riksbank started to raise the repo rate.

In the second half of 1994 the output gap narrowed (Figure 9). The Riksbank's assessment was that the output gap would become positive at the end of 1994. At the time the assessment was made only from the output gap calculated with the Whittaker-Henderson filter, as opposed to the current use of different measures of the output gap.²⁶ Industrial production had risen so rapidly that it exceeded the potential level by more than 5%.²⁷ The dual situation in the economy was clear from a comparison with the non-industrial output gap, which in the second quarter of 1994 was still about -2%. Increased production capacity presupposed investment on a considerably larger scale than indicated by

²⁶ Since 1996 the Riksbank uses three measures of the output gap. The W-H filter is based on a projection of actual GDP using the National Institute's forecasts. The PF method is based on an estimate of 6.5% for equilibrium unemployment in 1995 and 1996 in *Giorno et al. (1995)*. The Unobserved Component method is based on the use of relationships between observable variables such as inflation, output and unemployment and unobservable variables such as potential output and the NAIRU.

²⁷ Calculated with the filter technique mentioned above and reported in the *Inflation Report* in October 1994.

Figure 9
The output gap calculated with three alternatives*
 In per cent



* The Whittaker-Henderson filter (WH), the Unobserved Component method (UC) and the Production Function Approach (PF).

the statistics at the time. Total and industrial investment ratios were considerably below the average in the eighties. Inflation had been subdued by weak domestic demand since 1992 and upward pressures on prices were expected when the output gap was closing.

The internal conditional inflation forecast for 1995, based on unchanged interest rates and exchange rates, had risen from 2.9% in January 1994 to 3.1% in April and then further to 3.8% in August 1994.

The export-led recovery continued in 1995. Besides the expansion of exports, rising industrial investment also contributed to strong GDP growth. Inflation expectations remained above the inflation target, despite the tightened monetary conditions in 1994 and 1995. One reason for this was probably an increased regime shift premium (Figure 13), partly due to uncertainties regarding fiscal consolidation. In addition, wage increases in 1995 were high and averaged 6.1%.

Market overreactions

From August 1994 up to July 1995 the Riksbank increased the repo rate by 2 percentage points to 8.91. The fast and unforeseen inflation

developments during the summer explain the markets' overreaction to the initial repo rate increase to 7.2%, especially as the preceding inflation report, released in June 1994, downplayed the risk of increased inflation. Observers and market participants were largely surprised, given the message in the June report, and the fact that the move to increase interest rate was taken less than 40 days before general elections to the Swedish parliament were being held. The overnight forward rate curve, within a horizon of a few months, reached levels of 9–10%. However, after a few months, interest rate expectations stabilised along a path that was more in line with the Riksbank's intentions.

The repo rate hike in August 1994 was followed by a short period of unrest in the financial markets, which was reflected by high volatility in bond rates and exchange rates. However, the situation settled down soon and the krona strengthened in September and October. The long bond rate differential vis-à-vis Germany fell by more than 0.5 percentage points, partly due to the fact that much of the government's fiscal consolidation proposal, presented on 5th November, had been anticipated or leaked. In November there was also a referendum on whether Sweden would join the European Union or not, which resulted in a yes. Interest rates and the exchange rate moved little, suggesting that also the outcome of the referendum was largely anticipated.

Inflation surprises

In part, the fast pick-up in inflation during the summer of 1994 came as a surprise to observers of the Swedish economy. When the Riksbank started to increase interest rates in 1994, many commentators objected, arguing that no inflationary pressures were evident. Nine months later it was clear that the Riksbank's assessment in August had been correct. In retrospect, it is obvious that it is difficult to fully capture the overall inflation propensity in an economy during periods of major imbalances. Most of the increases in the repo rate during 1994 and 1995 took the form of quite sizeable steps of about 20–25 basis points. For a period in the spring of 1995, the increases came in smaller steps and at shorter intervals. The change in tactics coincided with unrest in financial markets, the use of a variable repo rate and the search for a somewhat more flexible monetary policy implementation.

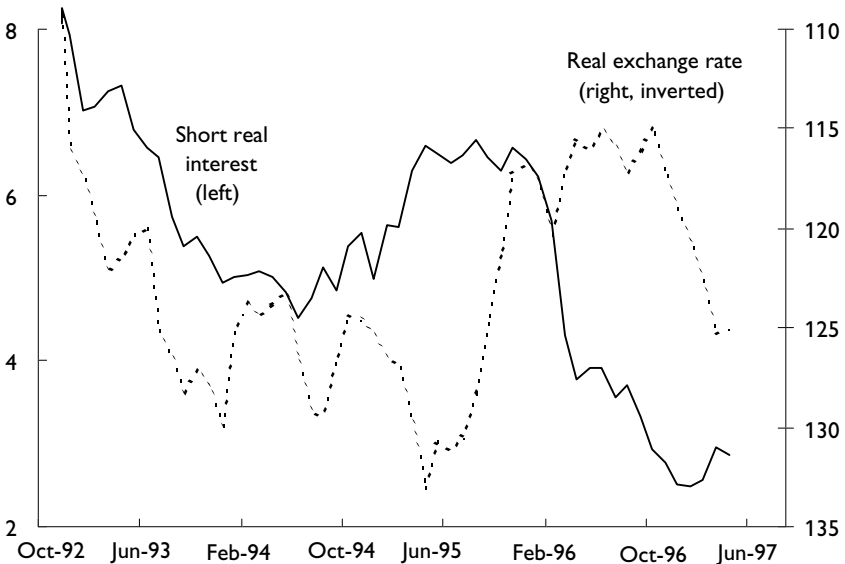
After the last increase in the repo rate, the Riksbank announced that it considered the krona undervalued and did not exclude currency

interventions to reinforce a positive trend in the exchange rate. This announcement appears to have helped draw attention to the improvements that had occurred in conditions for the Swedish economy. One, maybe the most important, improvement was Sweden's adherence to EU and the political support in the Riksdag (Sweden's parliament) for the convergence program and a consolidation of public finances. Another improvement was the alleviation of the dual situation in the Swedish economy. Current and expected domestic demand seemed more stable compared to the situation in 1993 and 1994 and forecasts for public finances gradually turned better.

A reminder that credibility was fragile and insufficient was the effects of the financial turmoil in the spring of 1995, which was due to the crises in Mexico and the failure of Barings. The krona depreciated sharply and long bond rates rose, as did the long bond differential vis-à-vis Germany, in line with high-yielding countries like Italy and Spain. The pattern that high-yielding countries are vulnerable in times of turmoil in the international financial market still included Sweden, and was partly reflected in the high exchange and interest-rate volatility. The fragility was aggravated by the fact that the consolidation of public finances still had a long way to go, which was also pointed out in the OECD report on the Swedish economy. This made Sweden's economy sensitive to international unrest both in terms of the effect on Swedish bond rates as investors sought *safe havens* and the effect of a higher bond rate/weaker krona on the cost of servicing Government debt. During the unrest in the spring of 1995 monetary policy faced transparency problems. Despite the fact that the Riksbank continued to raise the repo rate, monetary conditions could not be controlled as the weakening of the krona caused the real exchange rate to depreciate (Figure 10).

Between September and November 1995, the krona appreciated about 10% and the long bond rate fell by 1½ percentage points. The development had much to do with government finances. In November, when the semi-annual monitoring of the convergence programme was undertaken, the Government considered that the general government debt ratio would be stabilised already in 1998. The semi-annual monitoring arrangement provided a follow-up to the measures undertaken. Hence, the credibility of a sustainable budget consolidation improved. Moreover, the credibility effects of the tightening of monetary policy in August 1994 were becoming more evident. The Riksbank's decision to raise the repo

Figure 10
**Real three-month interest rate and
 real effective exchange rate**
 In per cent and index, October 1992 = 100



rate in August 1994 showed that monetary policy was pre-emptive and that long-term credibility considerations were in focus. Monetary policy had been tested in action for the first time during the new flexible exchange rate regime. The monetary tightening in August 1994 was a very important measure by the Riksbank to make the inflation target credible. Inflation expectations, according to surveys, fell significantly. The twelve-month rate of inflation was below the upper interval of the inflation target from June 1995 onwards, and the Riksbank gradually revised the inflation forecast towards the end of 1995. In 1995 inflation was 2.8%.

By the end of 1995, the Riksbank's monetary policy stance was being criticised as being too tight and lagging behind, in view of the inflation outlook and the decline in European interest rates. However, credibility considerations were a crucial restriction on monetary policy. After the tightening period had ended in the summer of 1995, the Riksbank stayed on hold. Apart from expected inflation considerations, the experiences

were that financial market assessments included both Sweden's inflationary history and a notion that the Riksbank's monetary policy had to be "tested in action" for some time to be considered credible. Considering the fragility of the recently acquired credibility and the arduous process of establishing it, the Riksbank chose to be cautious. This policy paid off. From the transition to a tight monetary policy in July 1994 to the end of 1995, the krona strengthened by 9.4% effectively and the long bond interest rate differential vis-à-vis Germany fell by 1.8 percentage points.

(iii) New conditions for monetary policy: January 1996 – spring 1997

These improvements also changed the conditions for monetary policy. Economic activity slowed during the second half of 1995, mainly due to the recession in continental Europe. In January 1996, the Riksbank concluded the time was right to start lowering the repo rate. In a Press Release on 9th January it was said that "inflationary pressure in the economy has eased. There is therefore an increased probability that in the coming years the rate of inflation will be in line with the price stability target." The internal main scenario conditional inflation forecast for 1996 and 1997 was somewhat above 2% in terms of headline CPI, with indirect taxes assumed to contribute around 0.2–0.4 percentage points to the annual increase in CPI. However, this internal forecast was based on a growth assumption on the high side for 1996 (around 2%) and it became increasingly clear that domestic and international demand was getting weaker than expected. Therefore, the internal discussion focused on the probabilities for alternative growth and inflation scenarios, giving more weight to a scenario in which the economy would grow at less than its potential rate in 1996.

The actual outcome for GDP growth in 1996 was 1.1%, with contributions to GDP growth stemming mainly from the continued increase in net exports accompanied by strengthened private consumption. However, this expansion of aggregated demand was countered by stock adjustment in industry and declining public consumption, which was related to the consolidation of public finances.²⁸

²⁸ The central government deficit shrank to 3.6% of GDP in 1996 from 7.7% in 1995. Data (out-turn) according to the Maastricht definition are available only for 1995 and 1996. The Government forecast for 1997 is a further reduction of the budget deficit to 2.1%, i.e. below the Maastricht criteria of 3.0% of GDP.

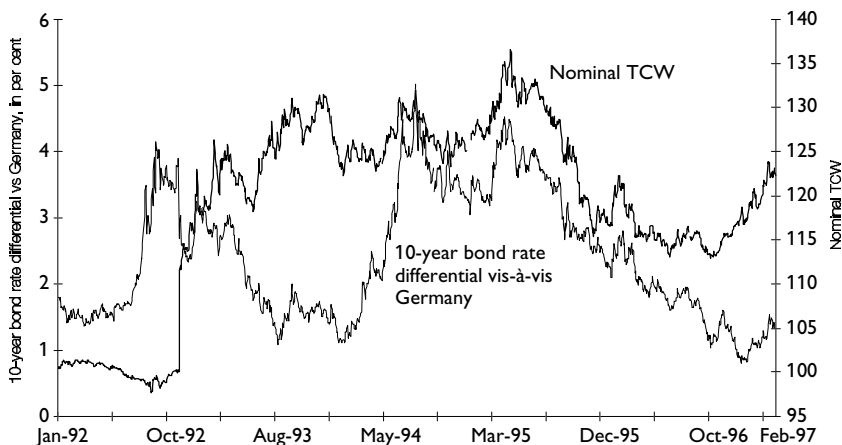
In the March 1996 inflation report, the Riksbank's view was that inflationary pressures were falling and that further easing of monetary policy was possible. It was also noted that "inflation expectations, as measured in surveys and in other ways, have eased down. The expected inflation is not yet on a level with the target but the downward revisions have been continuous and expected inflation is now inside the tolerance interval. In addition, international economic activity has weakened, thereby contributing to decreased inflationary pressure in the export sector. At the same time, domestic demand appears to have been slacker than envisaged earlier. All this has reduced the risks of inflation in the Swedish economy." The appreciation of the krona and international slowdown subdued Swedish growth. There were also signs that the economy had become less inflation prone in other respects as well. "In that case", it was noted in the March inflation report, "for a given demand situation the economy will generate lower inflation than before."

Policy transparency

This time the lowering of the repo rate began with relatively large steps, 20–25 basis points, at fairly regular intervals. The assessment of how far the repo rate would be able to be reduced was revised gradually as new and favourable information on inflationary pressures flowed in. The interest rate corridor was adjusted and more repo cuts followed in somewhat smaller steps, 10–15 basis points. In this process the Riksbank used the adjustments of the interest rate corridor as a tool to signal the future direction of the repo rate and the speed of adjustments. In the last three months of 1996 the cuts in the repo rate were made in larger steps once a month. Altogether the Riksbank lowered the repo rate from 8.91% in January 1996 to 4.10% in December. Generally the actions taken seem to have been intelligible. During 1996 the market's assessments of the speed and direction of the repo rate, according to overnight forward rate curves, were in line with those of the Riksbank; hence monetary policy appears to have been transparent.

Despite the easing of monetary policy during 1996, which caused the (overall) short interest rate differential to decrease, the krona strengthened and the long bond rates fell markedly. Credibility improvements, both fiscal and monetary, thus seemed to have been predominant. With actual and expected inflation in line with the inflation target, long bond rates could benefit both from lower short interest rates and credibility

Figure 11
Long bond interest rate differential vis-à-vis Germany and the effective krona exchange rate



effects on inflation expectations and the risk premia. The long bond interest rate differential vis-à-vis Germany fell markedly, reaching 0.9 percentage points by year end. The Swedish developments at the time mainly reflected improvements in fundamentals, although they took place against a background of stable international financial markets.

From October 1996 to May 1997 the krona's effective exchange rate weakened by 7.5%. It is difficult to single out a particular factor behind this recent weakening. A combination of cyclical factors, credibility effects and short-run market reactions seems to have had an influence.

First, *cyclical* factors, may have been at work. Countries in a phase of stronger activity may have cause to tighten the monetary stance, which normally leads to an appreciation of the domestic currency. The monetary stance in the United States and the United Kingdom was relatively tight compared with many other European countries. This contributed to a marked appreciation of the dollar and sterling against other European currencies, including the krona. The strengthening of the dollar and sterling accounted for approximately half of the krona's weakening since October 1996.

Second, the exchange rate may reflect *credibility* effects. For instance, the weakening of the krona against the Deutsche mark was accompanied

by a rising long-term (forward) interest rate differential against Germany. This probably had to do with uncertainty at the time both about the EMU process, which has been particularly liable to elicit effects in countries with a history of high inflation and problems with government finance, and about the future direction of domestic economic policy, partly connected with the persistently high level of unemployment.

Third, in addition to cyclical factors and credibility, the exchange rate may be affected by temporary supply and demand conditions in the exchange market.

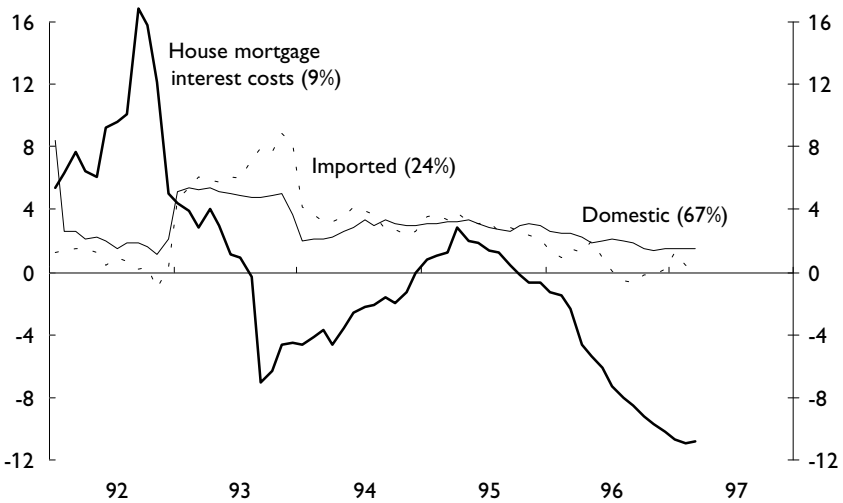
For example, prior to spring 1995, Swedish insurance companies were restricted to allocating their capital domestically. When the restriction was lifted, insurance companies acquired SKr 48.3 billion of foreign interest bearing securities during 1996. Thus, portfolio adjustments took place even before the krona started to depreciate, implying that the positive credibility assessments were large enough to compensate for both these portfolio adjustments and the decrease in the short interest differential up to October. Therefore, some credibility factor, e.g. a clearer EMU attitude and/or increased political risk (1998 being an election year), seemed to have triggered the weakening of the krona. The amplitude of the portfolio-adjustment effect on the exchange rate might have been fuelled by high volatility and “noise-trade” arguments.²⁹

Credibility subdues inflation

Inflation decreased sharply in 1996 and averaged 0.8%, which is below the lower tolerance interval of the inflation target. Early this year the twelve-month change in the CPI was close to zero. There were several reasons for this low inflation. First, all measures of the output gap indicate that inflationary pressures from the demand side were lower in 1996 than in 1995. The output gap by the end of 1996 was judged to have been around -2%. Second, in early 1997 inflation expectations were still falling. Third, the low rate of inflation stems in part from transitory effects, as the fall in the long bond rates together with the easing of monetary policy decreased house mortgage costs sharply (Figure 12). This decline was more rapid than expected, as households opted to repay fixed-interest loans in advance in order to obtain new loans at lower interest rates. The

²⁹ Trades influenced by non-fundamental information interpreted as signalling future price movements.

Figure 12
Components of the CPI



Note: The figures in parenthesis are the component's CPI weight in 1997.

Source: Statistics Sweden.

contribution to CPI from mortgage costs was -0.6% on average during 1996. The development of consumer prices for mainly imported goods contributed to the average inflation rate by merely 0.1% in 1996 (the CPI weight is 24%). Fourth, there are indications that price formation in general has changed as a result of increased confidence in the policy of price stability and better competitive conditions.³⁰ Prices have, for example, been more subdued than expected for several categories of services. A number of transport markets have been deregulated in recent years and local authorities are using competitive tenders to a growing extent for the procurement of transport services, e.g. public transport. Another category is car repairs, where costs for material and labour have fallen in connection with price adjustments to a more competitive market. Besides, lowered VAT on food decreased prices on domestic food by 6.3% .

³⁰ Borg and Croneborg (1997).

(iv) Market communication

To make monetary policy transparent, the Riksbank communicates with the market and the public through speeches, inflation reports and other publications. The inflation report is the most important policy document and is published four times a year. The purpose of the report is to provide a basis for monetary policy decisions and make the Riksbank's deliberations known to a wider public. The inflation reports contain an assessment of inflation and monetary policy as well as a brief account of the Riksbank's forecast.

The presentation of the outlook for inflation has improved since the first inflation report was published in October 1993. In the first reports, statements regarding future inflation were quite general. In the report published in March 1994 it was, for example, stated that "indicators for inflation expectations one to two years ahead show some downward revision since our report last October and imply that the Riksbank's inflation target is now expected to be met in 1995." In the report published in October 1994 it was said that "the expectation of firms and investors now exceed the inflation target for 1995."

In order to improve transparency and public understanding of monetary policy, the publication of the central bank's own inflation forecast can play an important role. However, there is also a need to give a very clear presentation of the actual inflationary pressures and evaluate past forecasts thoroughly. As the inflation forecast is made conditional on various underlying assumptions, it may be complemented by the presentation of alternative scenarios.³¹ In reality monetary decisions are not only based on point estimates of inflation but also on a distribution of possible outcomes.

More exact figures from the Riksbank's own forecast were introduced in the inflation report in November 1995 in which it was stated: "the Riksbank now foresees that inflation will be between 2.5 and 3% during 1996."

A dilemma when publishing forecasts of inflation is that they normally are based on the assumption of unchanged monetary policy. When the first projection was published in November 1995, the underlying assumptions regarding exchange rates and interest rates were also

³¹ It is also possible to present the relative likelihood of possible outcomes around the central projection as in the *Inflation Report* published by the Bank of England.

communicated to the market. The assessment was based on the average level of interest and exchange rates during the last two weeks.

In the March 1996 and later reports, inflation projections were based on more explicit scenarios or forecasts for the economy, e.g. indicating expected GDP-growth and the like. Also the assumption of an implicit path for future exchange rates was included. In the June 1997 report this was communicated in the following way: "this inflation assessment starts from some appreciation of the nominal effective (TCW) exchange rate from the level of 122, which means that the rate is around 2.5% weaker than in the March version of the main scenario." The reason for not publishing an exact path for exchange rates is that such a path easily could be misinterpreted as an explicit policy target. Under floating exchange rates and with an inflation target the exchange rate is only one (important) indicator of future inflation.

As the inflation forecasts are conditional on unchanged interest rates and an implicit exchange rate path, there is also a need to explain to the general public and market participants that the Riksbank's forecasts should not be evaluated against actual inflation outcomes in the same way as unconditional forecasts. One way to explain the conditional nature of the assessment in the inflation report is to rely on several alternative projections around the central forecast. In the inflation report in June 1996 risk scenarios around the central projection were introduced. Typically such risk scenarios assume alternative (implicit) paths for exchange rates and/or aggregate demand.

Other important channels for monetary policy communication, besides the inflation reports, are the speeches by the Governor and Deputy Governors; in 1996 they gave more than 20 speeches. In addition the Governor and Deputy Governors appear in hearings in the Standing Committee on Finance in Parliament.

Important policy issues are often clarified in such speeches. In December 1994, the Governor, Mr. Bäckström, for example discussed the role of the Swedish inflation target and clarified that the target refers to the rate of inflation in an annual perspective: "It is naturally the intention that inflation will be continuously kept at a low and stable level around 2%. But monetary policy cannot manage monthly changes in the CPI. So neither can the policy be evaluated on a monthly basis. At the same time, the policy must continuously incorporate new information."³² In May

³² Bäckström (1994).

1997, the Deputy Governor, Mr. Heikensten, discussed and clarified the role of the exchange rate in the conduct of Swedish monetary policy.

Working papers and articles in the quarterly review are also important in communicating analysis and forecast models to the market.

All information in inflation reports, speeches and published papers helps the financial market to understand the Riksbank's intentions. The Riksbank has studied the impact of inflation reports and speeches on the financial market.³³ One conclusion was that the speeches by the Governor and the Deputy Governors influenced short term interest rates in the intended way. Another conclusion was that the financial market anticipated changes in the repo rate to a large extent.

3. Three current issues

This section deals with current issues relevant to the Swedish economy and monetary policy. The purpose is to deepen the discussion of three aspects. First, in the light of experience and developing theory there is a discussion of the pros and cons of CPI as an inflation target. Second, the financial market's assessment of Swedish developments has proved to be very sensitive to signs of a return to the history of inflation and weak budget discipline. Therefore, a theoretical framework to the problem of the so-called regime shift premia is presented. Third, proposals aiming to increase the independence of the Riksbank supported by a substantial parliamentary majority have been presented in 1997.

CPI — the ideal index?

The Swedish inflation target is expressed as the change in the official consumer price index. The advantages of the CPI are well understood: it is widely familiar, published monthly with a short time lag, and rarely subject to revision. Using the CPI eases communication with the general public and politicians and has educational value. However, problems arise if the index is constructed in such a way that it does not correctly gauge inflationary pressures (Figure 4).

Price indices may have different purposes and uses which influences the way they are calculated. The CPI can be used as a compensation

³³ Lindberg et al. (1996).

index, i.e. as a basis for the calculation of compensatory payments to different groups. This means that political decisions enter into the choice of goods and services to include in the index. In practice this means that imputed prices may be included as well as administratively determined charges and fees. The CPI is meant to measure the price changes for total private consumption in the domestic market. A drawback is that the CPI obviously contains prices that are outside the control of the Riksbank (indirect taxes and subsidies) and prices that have perverse effects on monetary policy (mortgage interest costs). Another potential problem with the use of a conventional price index is that transitory price movements in the market prices of particular goods may mask a different development of the general price level. There are commodities that historically have given rise to such one-off effects on the price level, for example oil and food products.

Considerations like these provide an argument for eliminating the first-order effects of transitory price movements from the index and focusing on an underlying rate of inflation. A problem with this approach is that these price movements often are unexpected and cannot be identified in advance. It is also difficult, even with hindsight, to identify the first-order effects of a given change in subsidies or indirect taxes or of other price shocks.

Given these difficulties and the overriding need to re-establish credibility by being clear and transparent, the Riksbank continues to use the CPI as the official measure of inflation for the purpose of monetary policy. In the inflation reports, however, calculations of several different measures of underlying inflation are presented. In Figure 4, underlying inflation excludes the effects of changes in indirect taxes and subsidies and in imputed interest costs for owner-occupied homes. Domestic underlying inflation excludes, in addition, prices of imported components.

The problem with transitory price shocks is that they tend to give rise to sudden and unexpected price changes (whereas demand shocks tend to influence the price level only gradually). As a result, the central bank often has little time to react to supply shocks. And even if there is time to react, the attempts to eliminate the first-round effects on the price level would reinforce the negative effects on demand and output of the initial shock.

In terms of practical policy, the Riksbank has indicated that since occasional changes in indirect taxes and subsidies usually have limited effects

on the price level, it should be possible to accommodate them within the tolerance interval.

However, the Riksbank has also noted that there are price effects that cannot be accommodated within the band and cannot be fully contained with monetary policy measures. Attempts to do so would have destabilising effects on the economy. Thus, in the event of major unforeseen disturbances, as well as when indirect taxes and subsidies are altered in conjunction with a major reform of the tax and transfer system, scope must be provided for price effects. Temporary deviations from the targeted rate of inflation may accordingly occur, particularly in view of the fact that price stability does not refer to isolated monthly figures. However, any secondary effects should be contained so that inflation is quickly returned to a rate that is consistent with the target.

The above examples suggest that the Riksbank is dealing with the problem of price shocks through what has been referred to as “caveats”. However, these caveats have not been specified in advance in any systematic fashion but are applied more or less ad hoc. Consequently, the price shocks and the resulting variability of the CPI do present the Riksbank with an educational problem and do put a considerable burden on the presentation in its inflation reports.

The CPI has varied significantly more than the various measures of underlying inflation that the Riksbank produces. One example is 1996, when interest rates were reduced rapidly. The CPI then fell much more than the underlying inflation, due to a reduction of the interest costs for housing.

The problem of temporary influences can be managed in different ways:

1. One possibility is to clearly *specify* in advance which *deviations* from the CPI are acceptable. This is the method used in New Zealand. It could lead to greater transparency. On the other hand, it would be less clear exactly how the valid objective is defined. In addition, it is difficult to foresee all the corrections warranted and to quantify their exact price effects. Finally, it is a problem that corrections of this kind are so highly dependent on the central bank’s own assessments, which can influence credibility negatively.
2. A closely related alternative is to use a measure of the *underlying inflation* as the target. Compared to the first alternative, it has the advantage of giving a clear definition of the objective. It would,

however, lead to difficulties similar to those of the first alternative with respect to problems of defining and quantifying the effects of various disturbances.

3. Another possibility is to *supplement the CPI* by one or several measures of *underlying inflation*. In Canada, the objective is expressed in terms of the CPI whereas a measure of the underlying inflation – which describes the process of inflation better – is the operative target. In the long run, the final goal is reached since it is clearly linked to the operative target. A “softer” variant on the same theme is to clarify how policy is influenced by underlying inflation, since it often gives a clearer picture of the process of inflation.

It is important to note that the large changes which occurred in the repo rate and thus in the interest costs of housing in recent years were linked to the transition from the high inflation regime of the seventies and eighties to a regime of price stability. A continued confidence in the low inflation regime would imply that such large changes in the interest rate component are less likely in the future.

The Swedish CPI has a long and fairly distinguished history. It is available monthly since 1954, when a major revision of the then existing index was conducted. The calculation methods and sampling procedures are subject to rolling revisions and new goods are introduced continuously. The currently fashionable issue of a possible bias in the CPI appears not to be a problem in Sweden. No estimate of the total bias is available but it is clearly small and certainly much smaller than in, for example, the United States.

In March this year, the European Union began to publish Harmonised Indices of Consumer Prices (HICPs) for EU member states. These harmonised indices will be used for the assessment of inflation convergence in the union. They are not, however, intended to replace existing national consumer price indices. It will take some years before HICP harmonisation is complete. It remains, for example, to decide on the treatment of capital costs for owner-occupiers, the coverage of the index and the revisions of weights. In principle, the HICPs are to be pure inflation indices.

At present the HICP is not a candidate as a target variable for monetary policy in Sweden. As the work of harmonisation is still in progress, it is not clear just how the index will be calculated in the coming years. It will also be some time before a time series for the new index is available

that is long enough to be suitable for monetary policy analyses. However, HICP will be included in future inflation reports as an important indicator of inflation as well as for international comparisons.

Regime shift premia

As mentioned above, Sweden seems to be vulnerable in times of international financial unrest. In this section we give a short introduction to the meaning of regime shift premia in the term structure and how these may affect the relationship between forward interest rates and inflation expectations.

If investors fear that the economy will switch to a high inflation regime there will be a regime shift premium for holding bonds. Fluctuating regime shift premia may be one explanation why forward interest rates have varied more than inflation expectations obtained from surveys. Surveys only partly incorporate regime shift expectations. Forward interest rates normally also reflect investors' expectations about future monetary policy actions (changes in the short-term real interest rate), which tend to amplify the effect on forward rates that fluctuating inflation expectations give rise to.

Forward rates are often used as indicators of expectations of future economic conditions since, in contrast to spot rates, they contain information about a future period that is not affected by average expectations up to that period. The regime shift premia in forward interest rates can be seen as a compensation investors demand if they fear that the current price stability objective may be given up. The size of the regime shift premium depends on the probability assigned by investors of a shift to a high inflation regime. It is likely that such probability assessments in turn depend on the political support for the target, the size and development of the public debt, the degree of central bank independence and the past record of inflation. By controlling for the regime shift premia in forward interest rates, the central bank may obtain a better indicator of market expectations of future short term interest rates, inflation rates and currency depreciation.

To estimate the regime shift premia a model for the excess forward return is used.³⁴ The excess forward return, defined as the difference between the forward rate and the future short term rate, contains:

³⁴ For more details see Dillén and Hopkins (1997).

1. a traditional term premium;
2. a credibility factor quantified as the long forward rate differential relative to Germany;
3. a sensitivity factor (showing the credibility effects on the forward rate curve for different horizons);
4. a constant;
5. an error term.

Adding the second and third factor gives the regime shift premium. The long-term (10 year) forward rate spread between Sweden and Germany is used as an approximation to the credibility factor. Thus, the long-term forward rate differential can be seen as a quantitative measure of the degree of credibility of a low inflation policy. The other factors are estimated. In Figure 13 the regime shift premium since 1993 is depicted.

Analysing inflation expectations from surveys together with the forward interest rates and the regime shift premium makes it possible to answer several questions:

1. Whether changes in the forward interest rates arise from changes in inflation expectations within the inflation target or from expectations about a regime shift to higher inflation.
2. To what extent changes in forward interest rates reflect expected monetary policy actions.
3. Whether credibility aspects (regime shift premia) are reflected in surveys.

To obtain inflation expectations, surveys of financial investors' expectations of average inflation two years ahead are used.³⁵ These expectations should normally be a quite good proxy for the expected 1-year inflation rate, i.e. the expected rate of consumer price changes 1 year into the future.

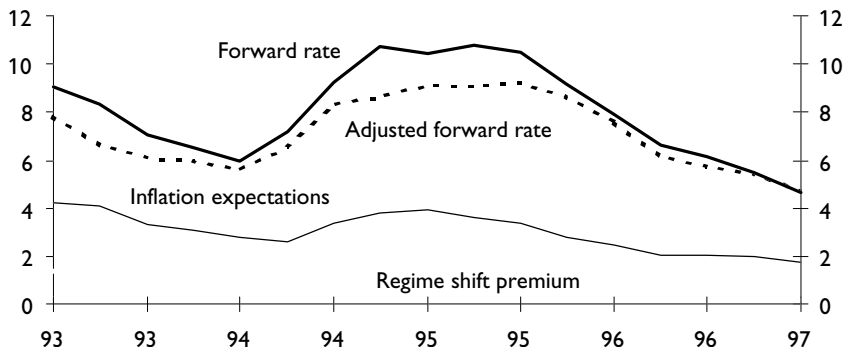
It is not a priori obvious to what extent surveys incorporate regime shift expectations. If participants in surveys report their inflation expectations in a mathematical sense, they should fully reflect anticipations of regime shifts. However, if participants report the most probable outcome of future inflation, then it is likely that regime shift expectations are incorporated to a very limited extent, provided a regime shift is considered unlikely. The forward interest rate is decomposed into a regime shift

³⁵ Aragon Securities, since 1991, measures quarterly the average expected two year Swedish inflation of the largest Swedish and foreign investors on the Swedish bond market.

premium and a term adjusted for the regime shift premium. The latter term should then reflect the expected future short term interest rate and the normal component of expectations of the future inflation rate (expectations within the regime). Since the real forward interest rate reflects investors' expectations of the future monetary stance we adjust for the estimated term premium as well.

As seen from Figure 13, the adjusted forward interest rate has been more volatile than inflation expectations. This indicates that expectations of monetary policy are reflected in the forward rate. The policy conclusion is that forward interest rates contain information about inflation expectations but it is important to take expectations of monetary policy into account, since they have a reinforcing effect.

Figure 13
Swedish 12-month forward rate and inflation expectations
 In per cent



Source: Aragon Securities.

The finding that inflation expectations extracted from forward rates are positively correlated with investors' inflation expectations suggests that the possibility of a regime shift to some extent is accounted for in the surveys. If this is true, then the policy implication is that one should be careful when it comes to the interpretation of inflation expectations obtained from surveys since they not only reflect expectations within the (low inflation) regime but also fears that the current price stability objective is given up.

Proposals for changes in the role of the Riksbank

When the present legislation regarding the Riksbank went into force in 1989, steps towards a more independent central bank were taken. The chairman of the board of the Riksbank is no longer nominated by the government, nor does the term of office for the Governor coincide with the term of the parliament. In 1993, several proposals to strengthen price stability as a goal for monetary policy and increase the independence of the Riksbank, were put forward by the Riksbank Commission (SOU 1993:20). An institutional reform of the Riksbank requires a change of the constitution, hence a decision in two consecutive parliaments. Therefore, broad agreement among major political parties is necessary before such a reform can be enacted.

The institutional setup of Swedish monetary policy after the introduction of the inflation target in 1993 is discussed by Svensson (1995), who criticised the fact that there is no legislated goal for Swedish monetary policy and that the current inflation target was announced unilaterally by the Riksbank's governing board.

In 1997, a Commission (SOU 1997:10) proposed legislative changes needed to transfer the responsibility for exchange rate policy decisions from the Central Bank to the Government. The Board of the Riksbank reacted to these proposals by stating that they "would be liable to undermine the credibility of monetary policy and thereby the Riksbank's ability to fulfil the objective of safeguarding the value of money." In a world with deregulated financial markets and free capital flows, it is inevitable that markets for money and currencies are directly interlinked and so are monetary and exchange rate policies.

A working group of the Riksdag has recently proposed a number of changes in the role and powers of the Riksbank (DS 1997:50). The proposals of the working group regarding the responsibility of exchange rate policy is more in line with the comments made by the Board of the Riksbank than with the proposals in the Commission Report (SOU 1997:10). The proposals aim to increase the independence of the Riksbank and, more specifically, to ensure compliance with the Maastricht Treaty and the statute of the ESCB. The proposals have the support of five of the political parties in the Riksdag and, accordingly, of a substantial parliamentary majority. The proposals that involve changes in the Constitution are expected to take effect from 1st January 1999.

The main proposals are as follows:

1. The primary objective of monetary policy will be to maintain price stability, and this objective is to be laid down in the law. (The present inflation targeting strategy was adopted unilaterally by the Riksbank in 1993.) The quantification of the objective will be left to the Riksbank. As long as the primary objective of price stability is not endangered, the Riksbank will also be expected to support the objectives of general economic policies.
2. With regard to exchange rate policy, the Government will have the authority to decide, after consultation with the Riksbank, on the choice of exchange rate regime. The Riksbank will have responsibility for the implementation of the exchange rate regime adopted by the Government. This means, for example, that the Riksbank will decide on the central rate and the band width in a fixed exchange rate system and on the practical application of policies in a floating rate system. According to the Riksbank Act, such decisions should be taken by the Riksbank after consultation with the Government.
3. The management structure of the Riksbank will be changed. Under the present system, the Governing Board, which is appointed by the Riksdag, has responsibility for operational matters in monetary and exchange rate policies. Although this system has worked well in the past, it is thought to be in violation of the requirement of central bank independence formulated in the Maastricht Treaty. The responsibility for monetary and exchange rate policies will instead be transferred to a new body, an Executive Board. The Executive Board will have six full-time members of which one will be chairman and Governor of the Riksbank. Their term of office will be six years and they will be replaced on a rolling basis. The Governing Board will retain general, supervisory functions and will appoint the members of the Executive Board.
4. It will not be possible to separate a member of the Executive Board from his position unless he no longer fulfils the conditions required for the performance of his duties or if he has been guilty of serious misconduct. This provision will be included in the Swedish Constitution.
5. Also having Constitutional status will be a provision to the effect that no public authority will be allowed to issue instructions to the Riksbank in matters relating to monetary policy. A corresponding

provision will be included in the Riksbank Act: no member of the Executive Board will be allowed to seek or accept instructions on monetary policy matters.

6. A few proposals aiming to ensure transparency and Riksbank accountability are also included in the report of the working group.

Concluding remarks

In November 1992 the Riksbank had to deal with a very delicate situation. The transition to a flexible exchange rate regime and the severe economic situation changed the conditions for monetary policy dramatically. Sweden experienced the deepest recession since the 1930s, public finances were subject to severe problems, and unemployment reached historically high levels. The credibility record from the 1970s and 1980s was weak and implied an arduous process ahead to bring inflation expectations down in line with long term price stability. In the light of Sweden's history, financial market assessments made us very sensitive to international and national unrest. It was against this background that the Riksbank had to formulate a new monetary policy aiming for long-term price stability.

Despite extreme imbalances in the Swedish economy in the early 1990s, economic policy, of which the Riksbank's monetary policy has been an important part, has succeeded in reducing long-term inflation expectations into line with the inflation target. Since the beginning of the 1990s Sweden has experienced a quite rapid transition from a high inflation to a low inflation economy. The difficult process of bringing down inflation expectations has taken far more time and effort. There are a few credibility improvements that have been of crucial importance. First, the political support for the consolidation of public finances – formalised in the convergence programme – has substantially increased confidence in long-term fiscal stability. Second, the Riksbank's decision to raise the repo rate in August 1994 showed that monetary policy was pre-emptive and that long term credibility considerations were in focus. These credibility improvements made it possible to ease monetary policy during 1996 without putting inflation expectations at risk. Despite the fundamental improvements in the Swedish economy since 1992, unemployment is still a severe problem. Structural unemployment, however, can not

be brought down by stimulating aggregate demand. Reforming wage formation, as well as other structural aspects in the labour market, are indeed still necessary in this respect.

The Riksbank's view is that monetary policy needs transparency to gain support and understanding for policy considerations. On several occasions Sweden has experienced severe effects of unrest in financial markets. During these occasions the Riksbank has lost control over monetary conditions in the short run, which made transparency more difficult. The financial market's assessments of the Swedish economy seem to be asymmetric in terms of evaluating new information against the past history. There is a risk premium in Sweden related to the risk that new information implies a return to an inflationary regime. The recent weakening of the krona, despite good fundamentals, might serve as an example.

The international aspects are becoming more important. On the one hand, the globalisation and deregulation of capital markets discipline economic policy makers. Along with the endeavour to consolidate public finances, this has positive implications for monetary policy. On the other hand, internationalisation has made it more difficult to interpret interest rates and exchange rates. It has become harder to distinguish short-term effects from long-term, credibility-related, effects. The fall in the long bond differential versus Germany in 1993 and the sharp rise after the international interest hike in February 1994 are examples.

The main surprise to the Riksbank since 1992 has been the unanticipated, large transitory effects on headline inflation due to increased credibility of economic policy. The Riksbank has had some problems in explaining monetary policy considerations, as headline inflation in an annual perspective almost reached the upper tolerance interval in 1995 and the lower tolerance interval in 1996. Underlying inflation – as an important indicator of long-term inflationary pressure in the economy – has become increasingly important to explain monetary policy considerations.

Giving the objective of price stability statutory force, as proposed by a working group representing a substantial parliamentary majority, will strengthen the objective's credibility.

Bibliography

- Andersson, Krister and Claes Berg (1995): "The Inflation Target in Sweden", in A. Haldane (ed.), *Targeting Inflation*, Bank of England.
- Bäckström, Urban (1994): "Monetary Policy and the Inflation Target", address at the Stockholm Stock Exchange on 9th December.
- Bernanke, Ben and Fredric S. Mishkin (1997): "Inflation Targeting: A New Framework for Monetary Policy". National Bureau of Economic Research, *Working Paper*, no. 5893.
- Borg, Tor and Mattias Croneborg (1997): "Structural Changes and Pricing". Sveriges Riksbank, *Quarterly Review*, no. 1.
- Dillén, Hans and Elisabeth Hopkins (1997): "Regime Shift Premia, Forward Interest Rates and Inflation Expectation". Work in progress, Sveriges Riksbank.
DS 1997:50, *Riksbankens ställning*.
- European Monetary Institute (1995): "The Role of Underlying Inflation in the Framework for Monetary Policy in the EU Countries".
- Giorno et al. (1995): "Estimating potential output, output gaps and structural balances". OECD *Working Paper*, no. 152.
- Hansson, Bengt (1993): "A Structural Model". Sveriges Riksbank, *Monetary Policy Indicators*.
- Hörngren, Lars (1992): "Swedish Economic Policy under New Conditions". Sveriges Riksbank.
- Hörngren, Lars (1995): "Monetary Policy in theory and Practice". Sveriges Riksbank, *Quarterly Review*, no. 3.
- Hörngren, Lars and Ann Westman-Mårtensson (1991): "Swedish Monetary Policy: Institutions, Targets and Instruments". Sveriges Riksbank, *Arbetsrapport*, no. 2.
- Lindberg, Hans, Kerstin Mitlid and Peter Sellin (1996): "Monetary tactics with an inflation target: the Swedish case". BIS *Conference Papers*, Vol. 3, "Implementation and tactics of monetary policy", pp. 231–49 (March 1997).
- Regeringens proposition 1996/97:150 (Budget Bill 1997).
SOU 1993:20, *Riksbanken och prisstabiliteten*.
SOU 1997:10, *Ansvar för valutapolitiken*.
- Svensson, Lars E. O. (1995): "The Swedish Experience of an Inflation Target", in Leonardo Leiderman and Lars Svensson (eds.), *Inflation Targets*, CEPR, London.
- Svensson, Lars E. O. (1996): "Inflation Forecast Targeting: Implementing and Monitoring Inflation Targets". Bank of England, *Working Paper Series*, no. 56.
- Svensson, Lars E. O. (1997): "Inflation Targeting: Some Extensions". Institute for International Economic Studies, Stockholm University.
Sveriges Riksbank, *Inflation reports 1995–1997*.