Inflation targeting and Swedish monetary policy – experience and problems*

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Having looked at monetary policy from both sides now, I can testify that central banking in practice is as much art as science. Nonetheless, while practising this dark art, I have always found the science quite useful. (Alan Blinder[1])

Experience of explicitly targeting inflation has been positive and this has influenced the monetary-policy debate even in countries that do not use such a target, for example the United States and the EMU countries. This article analyses problems, in principle as well as in practice, that Swedish monetary policy faces, for example the choice of a specific target, what the uncertainty in inflation forecasts implies and the extent to which variables other than inflation should be considered when the Riksbank forms its policy. The authors emphasise that two factors which contribute to the credibility and general acceptance of policy are transparency and clarity.

At 2.28 p.m. on 19th November 1992 the Riksbank – Sweden's central bank – announced that the policy regime with a fixed exchange rate was being abandoned. This left Swedish monetary policy without an anchor. On 15th January 1993, however, a new anchor was in place: the objective of monetary policy was to be price stability. In the coming two years the policy goal was to avoid an increase in inflation's underlying rate. As of 1995, inflation would be held at an annual rate of 2 per cent, with a tolerance interval of 1 percentage point up or down. Similar explicit inflation targets had been introduced earlier in New Zealand (1990), Canada (1991) and the United Kingdom (1992).

[1] Blinder (1997), p. 17.

* The authors wish to thank all their colleagues at the Riksbank who have provided valuable comments, suggestions and criticism: Mikael Apel, Claes Berg, Urban Bäckström, Stefan Ingves, Hans Lindberg, Fredrika Lindsjö, Kerstin Mitlid, Christina Nordh-Berntsson and Staffan Viotti. Useful discussions with Peter Englund and Lars Svensson are also acknowledged. The article has been translated from Swedish by Patrick Hort.

Experience with a flexible exchange rate regime and an explicit inflation target has been good.

On the whole, experience with a flexible exchange rate regime and an explicit inflation target has been good in Sweden, as well as in other countries with a similar policy. The generally favourable economic trend during the recovery from the deep recession in the early 1990s has clearly been a major factor in this respect. In contrast to the economic upswing in the 1980s, however, the good growth has not led to increased inflation.

The encouraging results do not mean that the problems associated with an inflation-targeting policy have all been solved. In the countries with an inflation target, the conduct of monetary policy is being developed continuously. At the same time, the ongoing theoretical and empirical research in this field is improving the possibilities of discussing the problems in an orderly, comprehensible way. The practical experience and research findings are being considered in monetary-policy discussions not only in the countries with an explicit inflation target but also among those with somewhat different policy regimes, for example the United States and the EMU countries (Bernanke et al., 1998).

We therefore find it relevant to describe the considerations that guide monetary policy in Sweden and the experience we have gained. Our aim is to present some of the problems, of a principle as well as a practical nature, that have been and still are being encountered, both to clarify the Riksbank's current line of thought and to stimulate a deeper analysis and discussion.

The article begins with the background to the present policy regime: the importance of low inflation and why there was still a relatively long period of high inflation in Sweden. We then consider a number of important issues that to some extent are still unsettled and concern practical aspects of an inflation-target policy: the most relevant way of measuring inflation, which target deviations are acceptable and for how long, the difficulties connected with forecasting inflation, and the need of transparency and clarity when forming, explaining and anchoring monetary policy. The discussion of principals is interleaved with practical examples of experience in Sweden.

Benefits of low inflation

High inflation is costly, specifying the costs is not as simple.

While there is broad agreement that high inflation is costly, specifying the costs is not as simple. One important circumstance, however, is that the high degree of prosperity in modern, developed economies is connected to a substantial extent with the existence of payment systems that function efficiently.[2] The modern way of exchanging goods and services through the medium of "money" in a wide sense is much more efficient – in terms of costs and welfare – than the forms of exchange that preceded the era of the monetary economy. Harvesting these gains in efficiency in full presupposes confidence in the payment system, and that in turn calls, among other things, for a stable and predictable value of money.

Another well-known fact is the uncertainty that accompanies high inflation; when inflation rises, its future path becomes more difficult to predict. There have been many instances of economic systems that ceased to function when inflation became exceedingly high and confidence in the payment system collapsed. Even moderate rates of inflation lead to problems, such as the difficulty in indexing tax systems to make them robust to fluctuations in inflation (Bakshi et al., 1997). Another common criticism of inflation is its arbitrary redistribution of income and wealth.

The thesis that high inflation is difficult to combine with a good economic development is supported empirically. Experience in Sweden in the 1970s and '80s is a clear example: government and parliament made repeated attempts to sustain employment by solving the problems of inflation and costs by resorting to devaluations. This policy contributed to an unstable economic development and weak trends for productivity and investment (e.g. SOU, 1991:82). Another consequence was the massive investment in the real-estate sector, which seemed rational in the prevailing inflationary climate but subsequently came to grief.

Level of the inflation target

The insight that high inflation is disadvantageous for economic performance does not mean that the optimum target is zero inflation.[3]

Inflation can be seen as a tax on money, and one argument for a positive rate of inflation is that inflation's optimum rate as a tax is presumably not exactly zero. This is particularly valid in less developed economies. Most taxes have negative effects, and one of the problems with public sector financing is how these negative effects can be minimised. It is conceivable that some taxation via inflation may be preferable to raising other taxes.

[2] For a textbook presentation of this argument, see Marquis (1996), Ch. 1.
[3] For an overview, see Ayiagari (1990).

Compared with zero inflation, a low positive rate facilitates necessary adjustments in relative wages and prices.

The main argument in favour of some inflation, however, is now commonly considered to be that, compared with zero inflation, a low positive rate facilitates necessary adjustments in relative wages and prices. The grounds for this are said to be that nominal prices and wages display downward rigidity. The same is true of nominal interest rates, which do not normally fall below zero. Negative real interest rates may be needed occasionally, however, and this does require some positive inflation. The conflict between low inflation and good economic development seems to be appreciable only when inflation is very low, under 1 per cent (Akerlof et al., 1997). Moreover, there is no natural law behind the nominal rigidities in contracts for labour, goods and financing that renders them independence of economic policy. Empirical studies of price and wage rigidities have tended to be based on observations from periods when annual inflation exceeded 2 per cent. When inflation has been consistently low and stable for a time, it will presumably be more common that prices and wages can be lowered as well as raised.

A problem in this context is that the official figures for inflation are usually considered to overestimate the price component. This has to do with the difficulty, for example, of distinguishing a more general inflationary process from price increases that represent improvements in the quality of just those products. To this should be added other types of measurement errors occasioned, for example, by continuous shifts in household consumption in favour of cheaper goods and services, a process that measurements of inflation have difficulty in capturing (e.g. Boskin et al., 1998).

One of the matters being discussed is whether monetary policy should have an inflation target rather than a target for the price *level*. Even if an inflation target does lead to a stable rate of inflation, that is not the same as a stable price level. However, a price level target can also be formulated to allow some inflation if this is considered desirable (for reasons indicated above), that is, the targeted price level can change over time. More knowledge is needed before it can be said whether an inflation target is preferable to a price level target or vice versa (Svensson, 1997a). Besides depending on the exact specification of these targets, this question calls for more knowledge about a number of relationships between inflation, monetary policy and real economic development.

Where does all this lead us? The relevant literature hardly provides grounds for being more explicit about the reasonable level of inflation target than Alan Blinder's reflection that inflation should be so low that people in general do not bother about it when making economic decisions (Blinder, 1995). That presumably refers to a rate around 1 or 2 per cent. This is also a level that many central banks have chosen for their policies.[4]

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When the Swedish inflation target was specified in January 1993, this was done with reference to the observation that "underlying inflation" at that time was about 2 per cent. In other words, it was the Riksbank's ambition to keep inflation at the low level to which it had fallen during the recession in the early 1990s and before the fixed exchange rate had been abandoned. Another important circumstance was probably the discussions at that time about returning to a fixed rate with the German mark or the future euro. The historical rate of inflation in Germany had been somewhat higher than 2 per cent but it was commonly considered that the Bundesbank aimed for a rate between 1.5 and 2 per cent.

Credibility versus flexibility

Price stability was more or less the norm in the West for at least a century before World War II (on average that is – inflation and deflation alternated). In the post-war period up to 1980, inflation was positive and showed a rising trend. As this occurred throughout the OECD area, it is natural to ask what it was that changed the post-war pattern of inflation in the West when the arguments for price stability were already familiar.

The problem of credibility[5]

Economic research has found that post-war inflation's upward trend had to do with monetary policy's high ambitions for employment (e.g. Barro & Gordon, 1983). In the early post-war decades it was increasingly considered – in public debate as well as in the economic literature – that employment could be permanently increased by boosting demand and inflation.

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[4] An interesting question is whether *de facto* inflation targets can be derived from central bank behaviour and, if so, to what extent they deviate from the official targets; cf. Clarida et al. (1998*b*).

[5] For a deeper discussion of the credibility problem and applications to Swedish monetary policy, see Apel & Viotti (1998).

In the late 1960s and early '70s this idea was thoroughly refuted – by practical experience as well as theoretical arguments – but as employment had come to be seen as a target variable for monetary policy, there was now a problem of credibility. Although inflation and employment are not related in the longer run, an expansionary monetary policy that is *unexpected* and leads to inflation being higher than expected can lead to a temporary drop in real wages, with higher demand for labour and increased output. If full employment becomes a target for monetary policy, one can thus expect that central banks will try to stimulate demand and generate higher inflation (e.g. by supporting an expansionary fiscal policy).[6] Firms and households then incorporate this insight in their inflation expectations, which are one of the mechanisms that influence inflation's path. When inflation is expected, however, it ceases to have positive effects on employment.

This argument is supported by empirical observations. Compared with longer periods, inflation and employment are more clearly linked in periods that are so short (a couple of years or a business cycle) that people have not yet fully adjusted their inflation expectations. The higher inflation in the developed countries coincided with the period of Keynesianism and the higher ambitions for employment. Inflation was higher in countries where the central bank had a relatively low degree of independence in relation to the government and parliament (which often meant that its objective included other goals besides price stability). There is no evidence, however, that higher inflation could be associated with a better development of employment or higher economic growth in the longer run.

Against this background – the perceived drawbacks and the lack of lasting benefits from high inflation and unstable prices – in the 1980s and '90s monetary policy has been realigned in many countries. Combating inflation has been highlighted as an important function for monetary policy, with correspondingly less emphasis on combating unemployment. This has amounted to at least a partial return to the opinion that prevailed before the era of Keynesianism. A number of countries have also implemented reforms that increase the independence of their central banks. This was done both to ensure that monetary policy would focus on price stability in practice and to enhance the confidence of economic agents that this was the case.

Arguments for flexibility

The aim of making a low-inflation policy credible does not mean, however, that central banks completely disregard monetary policy's short-run effects on produc-

[6] Links between fiscal policy, inflation and credibility problems are exemplified in Persson et al. (1995).

tion and employment. In practice, the way in which monetary policy with a price stability target is conducted takes growth and resource utilisation into consideration in several ways. In other words, central banks are *not* what Mervyn King, Deputy Governor of the Bank of England, has called "inflation nutters".

Avoiding deflation is no less important than avoiding high inflation.

First, if the *inflation target* is formulated symmetrically, as in Sweden, people will realise that avoiding deflation is no less important than avoiding high inflation. This has to do with the arguments against very low inflation that were outlined above and which are based on concern for general economic development.

Secondly, the *transmission mechanisms* whereby monetary policy influences inflation involve a co-variation between resource utilisation (in relation to the capacity ceiling) and the underlying inflation process. Rising resource utilisation tends to be associated with rising inflation and vice versa. This means that, when forecasting inflation as a basis for monetary policy, it is relevant for central banks to consider real economic development. It also means that interest rate adjustments that are motivated by rising (or falling) inflation can help to smooth resource utilisation and reduce fluctuations in economic activity.

Thirdly, besides the policy effects on inflation, there are reasons for explicitly considering monetary policy's consequences for the development of *output*. The reasonableness of this is easily demonstrated. Increased productivity or decreased costs (e.g. the recent productivity gains and falling raw materials prices – positive supply shocks) leads to rising output and employment, accompanied by falling prices.[7] In order to maintain the rate of inflation in such a situation, monetary policy would have to become more expansionary, which may accentuate the growth of output and employment to a degree that is not sustainable in the longer run. For stability it may then be desirable to let inflation fall below the target for the time being. Negative supply shocks (oil price hikes, for example) lead, of course, to the opposite.

A number of studies suggest that central banks avoid conducting a monetary policy that would tend to accentuate economic fluctuations even though that might result in lower, more stable inflation. It can therefore be said that in practice, monetary policy does not focus exclusively on an inflation target. To quote Lars Svensson (1998*c*), an inflation-targeting policy can be described as flexible rather than strict. Besides attaching a certain amount of importance to stabilising

[7] We assume throughout this article that there is a stable relationship between changes in output and employment. However, this relationship is affected by technological advances and the workings of the labour market. A common phenomenon is "jobless growth". Space does not permit further discussion of this topic here.

cyclical variations in production and employment, central banks also try to avoid the instability in interest rates – as well as more generally in financial markets – that could result from an uncompromising anti-inflation stance. Thus, a *gradual* adjustment of interest rate policy to changes in the economic conditions and forecast inflation is more common than drastic changes in interest rates to keep inflation in its place (e.g. Svensson, 1998*a*, *b*; Hallsten, 1998; Sack, 1998).

Central banks accordingly face the challenge of winning credibility for a low inflation target while conducting a monetary policy that is sufficiently flexible to dampen short-run fluctuations in output and employment without jeopardising the long-term goal. In this context there are certain circumstances that should be borne in mind. Monetary policy does not attempt to exert an influence on the long-term *level* of employment (or production); what it can do is mitigate the short-run *fluctuations* around this long-term path. There is no inevitable conflict between monetary policy's long-term objective, price stability, and the desirability of smoothing fluctuations in real economic activity. These objectives are compatible, however, only if inflation target credibility is not weakened; otherwise, output and employment are both liable to show a poorer outcome than necessary.

The debate in Sweden

A first step towards making the Riksbank more independent was taken in 1988.

The international pattern, with rising inflation up to the 1980s and a subsequent fall, applies to Sweden, possibly with some time lag.[8] A first step towards making the Riksbank more independent was taken in 1988, when our governor's mandate was lengthened and disconnected from the term of parliament. A pattern that had virtually become a fixed practice, whereby our board was chaired by an under-secretary-of-state from the Ministry of Finance, was also broken at that time.

In those days monetary policy did not have an explicit inflation target; instead, a fixed exchange rate with a basket of foreign currencies had been perceived for many years as a suitable intermediate target. This exchange rate target was intended to function as a stable nominal anchor for inflation expectations and wage demands, particularly as it was an (informal) undertaking with other countries.

In practice, however, this policy had not worked. Inflation in Sweden in the 1970s and '80s had been higher than in countries with which we trade. Devalua-

[8] In the matter of targeting inflation, Sweden has not taken a rear seat; during a period in the 1930s, Swedish monetary policy was guided by an explicit price stability target. Cf. Berg & Jonung (1998).

tions of the krona were used to compensate for this. In the 1991 Budget Statement, the Government then declared that "A policy for a fair distribution and full employment must give the fight against inflation precedence over other ambitions and demands" (Ministry of Finance, 1991). When unemployment subsequently rose, countermeasures were not taken to the same extent as before, and the fixed exchange rate was maintained. Moreover, the goals of the coalition government that took over in the autumn of 1991 included increased independence for the Riksbank.

At that time, after the excesses in the latter part of the 1980s, there was probably relatively widespread support in Swedish society for bringing inflation down and maintaining a fixed exchange rate. But this was hardly accompanied by as much support for a more independent central bank. Opinion may well have shifted in the opposite direction in the light of developments during 1992, when the Riksbank was forced to abandon the fixed exchange rate. The defence of the krona during the autumn of 1992 was admittedly supported by a broad array of politicians and economists – at least to judge from the contemporary discussion – but afterwards and in connection with the introduction of the inflation target, the Riksbank was heavily criticised from many quarters.

In the Riksbank Enquiry, which reported in February 1993, the Commission's non-Socialist majority proposed a statutory inflation target and a more independent status for the Riksbank, while the Social Democrat members submitted reservations. As the proposal would require constitutional amendments and was otherwise of a nature that made it inappropriate to adopt with a slim majority, it did not result in a government bill.[9] It may be worth noting that opinions among Swedish economists also differed on how far one should go to gain credibility for a low-inflation policy (e.g. the papers in Bergström, 1993).

With free capital movements there were only two sustainable choices: either completely fixed exchange rates or a completely free float.

Half a decade later, the picture is somewhat different. Among economists in the academic world there has recently been strong support for the ideas about a price stability objective, a flexible exchange rate and central bank independence, notwithstanding this world's very strong support for the fixed exchange rate in the 1980s.[10] After the exchange rate crises in the early 1990s, it was

[9] Posen (1993) argues that it is public support for a low-inflation policy, rather than central bank independence as such, which is conducive to low inflation.

[10] One of us recalls a seminar arranged by the Swedish Centre for Business & Policy Studies (SNS) to mark the publication of the Brookings Report on the Swedish economy in 1987; on that occasion the notion, launched in the Report, of a flexible exchange rate was savaged by all the Swedish economists present, with one exception.

a widespread conclusion that with free capital movements there were only two sustainable choices: either completely fixed exchange rates, as in a monetary union, or a completely free float (e.g. Eichengreen & Wyplosz, 1993). In the latter case, an explicit inflation target can be an appropriate nominal anchor and heightened central bank independence a way of giving the inflation target credibility.

No less remarkable than the change of opinion among economists is the way in which support for focusing monetary policy on price stability has grown in the political debate. Attitudes to central bank independence have also changed, as is evident, for example, from the new Riksbank legislation that was agreed by five of the parties in the Riksdag (Sweden's parliament) in the spring of 1997. Under the new law, the monetary policy objective is to be price stability. The Riksbank's independence will be enhanced in that, for example, the new executive board, appointed for a term of six years, is debarred from taking instructions in monetary policy matters. Besides the purely national need of credibility for a low-inflation policy, an important factor behind the new legislation is Sweden's adherence to the Maastricht Treaty in connection with EU membership and the Treaty provisions concerning central bank independence.

Support for a central bank is conditioned by the results of its monetary policy. As mentioned earlier, economic development in Sweden has been relatively good since a recovery from the acute crisis began in the summer of 1993. The major remaining problem is employment. Today, however, it is seldom argued that a permanent solution to this problem would be to stimulate demand via monetary policy.

We believe that the increased awareness among economists and politicians that an inflation-targeting policy should be flexible rather than strict has contributed to the increased acceptance of monetary policy as well as to the support for a more independent Riksbank.[11] Traditionally, central banks have tended to deny that in practice their monetary policy decisions have been coloured to some extent by other considerations in addition to long-term price stability. They try to create the impression that low inflation is their sole concern. Along with Stanley Fischer (1993) and others, we believe that this strategy is not advisable. It is rather the case that monetary policy credibility can be strengthened by an open discussion of the relevant considerations. This argument is presumably valid in particular in countries like Sweden that have a tradition of openness in the public discourse, a lively economic policy debate and a strong Keynesian tradition.

[11] A comparison of the arguments in the Riksbank Enquiry (SOU 1993:20), Svensson (1994), the EMU Enquiry (Calmfors et al., 1997) and Svensson (1997b) shows how attitudes to these matters have clearly changed over time.

Agreements must be constructed so that they are consistent with the Riksbank's inflation target.

There are many indications that a high degree of inflation target credibility has now been achieved in Sweden. The rate of inflation expected by economic agents is now in line with the 2 per cent target even in a five-year horizon. Surveys of price setting in financial markets give the same picture (e.g. the Riksbank's Inflation Report, September 1998). A different type of indication that monetary policy has gained increased credibility is that one of the main sources of criticism of the Riksbank in the past decade – the Swedish Trade Union Confederation – made it clear in the run-up to the latest round of wage negotiations that agreements must be constructed so that they are consistent with the Riksbank's inflation target.

Forward-looking policy

The fact that support is now being established for the inflation-targeting policy and a more independent Riksbank does not mean that all monetary policy's important problems have been solved. The practical execution of monetary policy involves a number of difficult choices. In many respects the difficulties arise because of the time lag before measures by the Riksbank affect inflation. Moreover, inflation is influenced in the short run by various types of shocks that are beyond the control of the Riksbank, even though inflation in the longer run is determined by monetary policy. These circumstances raise a number of important questions: At what time horizon is it possible for the Riksbank to influence inflation? Which deviations from the inflation target are tolerable? How quickly ought the Riksbank to aim to bring inflation back to the target after a shock?

The target horizon

Experience and empirical studies demonstrate that there are lags before monetary policy measures produce effects (e.g. Bernanke & Gertler, 1995; Gerlach & Smets, 1994). Analysing the transmission mechanisms more exactly is difficult, however, and the situation in Sweden needs to be studied in more depth. Interest rate adjustments act through many different channels, for example via total demand as well as movements in the exchange rate and other asset prices and their effects on wealth. With the structural shifts in the Swedish economy and the associated changes in economic behaviour, the effects may not be the same as before. But policy clearly has to be forward-looking, focusing on future inflation, because it takes time for a large part of monetary policy's effects to materialise. The focus for Swedish monetary policy lies 12–24 months ahead. From this it follows that the policy is guided by forecasts of inflation's path mainly in the next 12–24 months.[12]

This does not mean that our endeavour is – or even should be – invariably to be exactly on target at a horizon that has been fixed once and for all. In practice, monetary policy has to balance different considerations. One such problem has to do with the trade-off mentioned earlier between short-run inflation and monetary policy's effects on the economy in general. There may be grounds for weighing the ambition to achieve a rapid return to the targeted rate against the costs this might incur in the form of economic instability. Depending on the type of shock and its magnitude, it may be advisable to allow more, or less, time for inflation to return to the target, even if the forecasting horizon were always exactly 24 months.[13]

An example of this type of discretion is the decision, when the inflation target was introduced at the beginning of 1993, to have an interval of two years (1993 and 1994) in which to bring inflation down to the targeted rate. The import price increases that were expected in the wake of the krona's major depreciation would then have time to pass through the system. The alternative would presumably have called for an exceedingly stringent monetary policy squeeze.

The target deviations in current inflation are largely dependent on the central bank's credibility.

In practice, the target deviations in current inflation which are acceptable in the short run are largely dependent on the central bank's credibility. If confidence in the policy appears to be lacking, a "conservative" policy may be called for: preventive interest rate increases at an early stage and no cuts until the need for them is evident to everyone. Decisions of this type have been a feature of Swedish monetary policy ever since 1992. They carry the risk that inflation will subsequently turn out to be off the target. They have the advantage of reducing the risk of problems with credibility and the attendant need of abrupt policy changes.

Some of the Riksbank's critics have argued that the initiation of the interest rate cuts during 1996 is an example of an unduly cautious policy – the cuts should have been larger and more frequent. There is a hole in this argument in that during the autumn of 1995 the Riksbank's own assessments, as well as those of other leading Swedish agents including the critics, had suggested that inflation would not even be down in line with the target in the latter part of 1997. Thus it was not that the Riksbank departed from the principles for its policy but that all

[12] The theoretical foundation for using forecast inflation as an intermediate target has been presented and discussed by Lars Svensson in a number of articles, e.g. Svensson (1998*a*, *b*).

[13] Bernanke et al. (1998), who have compared different countries' inflation-targeting policies, formulate this in terms of a central bank having a short-run inflation target that deviates from the long-run target.

the forecasts were wrong. The subsequent gradual interest rate cuts were motivated by concern about the negative reactions in the long bond rates and the exchange rate, for example (Heikensten, 1996).

Implications of uncertainty

A major question when policy has to be forward-looking is how the formation of policy should be influenced by the uncertainty in the underlying forecasts. In monetary policy practice, as well as in theoretical models, uncertainty is an additional argument on the side of caution, besides the above-mentioned need to consider the development of output and credibility. Our September 1998 Inflation Report provides a good example of this; one reason for deciding to leave the repo rate unchanged was the uncertain situation.

In monetary policy practice uncertainty is an additional argument on the side of caution.

The part played by uncertainty in practice is even greater than the weight assigned to it in theoretical analyses. The risk factors are sometimes clearly defined, for example prospects in international financial markets or the domestic labour market. Monetary policy decisions are accordingly taken in the light of risk scenarios with varying probabilities. The spectrum of risks is not necessarily symmetrical – there may be more risk of inflation being above the target than below. It is not self-evident how this ought to influence policy but there are many examples which show that the whole spectrum of risks, not just the point inflation forecast, does play a part in the formation of monetary policy.

The problem of uncertainty is also bound up in a complex way with another problem that does not appear to have been thoroughly examined – the choice of a targeting horizon. While there is much evidence, as mentioned, of a lag before monetary policy measures affect output and inflation, it is also probable that certain effects occur immediately via interest rates and the exchange rate. Moreover, the path of the economy in the immediate future is normally more certain than where the economy will be in two to three years time, for example. Small but comparatively certain short-run effects of monetary policy have thus to be balanced against larger but less certain effects in the longer run. An interesting question is whether the immediate future should carry more weight in monetary policy than is warranted solely by the fact that it takes more time for policy's largest effects to materialise.[14]

[14] In this context, an important question – implicit in our argument but to our knowledge not yet analysed – is the degree of risk aversion that is appropriate for a central bank. In other words, how much does it matter that conceivable scenarios for future inflation are associated with different degrees of uncertainty about the expected outturn, and how serious is it if the central bank errs in its assessments?

An example of the finally balanced decisions this may involve is the interest rate cut last June. The current assessment at the Riksbank was that during 1999 and the first half of 2000 the rate of inflation would move up so that at the 24-month horizon it would be some tenths of a percentage point below the 2 per cent target. At the same time, it was highly probable that inflation would be appreciably below the target earlier in the forecast period. In such a situation, how much importance should be attached to the fact that the near future can be forecast with greater certainty?

A strong dose at an early stage may sometimes be needed to avoid an inflationary spiral.

A final point is that this argument does not imply that small and gradual interest rate adjustments are always the best medicine. A strong dose at an early stage may sometimes be needed to avoid an inflationary spiral (Clarida et al., 1998*a*). That was one of the considerations behind the interest rate increase in the autumn of 1997 – it was appropriate in view of inflation's forecast path in the coming two years. Moreover, the increase was made so that there was enough time for it to influence the inflation expectations in the coming round of wage negotiations.

The target variable

Considering that there is now broad agreement about the benefits of low inflation and even about roughly the level of low inflation that should be accepted, it may seem odd that the *definition* of inflation is still being debated. How can one know the appropriate level for a variable before the content of the variable has been settled? The fact remains that the appropriate measurement of inflation is still being widely discussed and studied by central banks as well as others. Monetary policy is not, in fact, the only instance of problems with definitions when economic theory is applied in practical politics. It is hardly controversial to claim, for example, that low unemployment and a high material standard are important economic policy goals but it may still be asked whether the official statistics on registered unemployment and gross national product do in fact measure the relevant parameters.

Targeting the CPI

The Riksbank's inflation target is formulated in terms of the *change in the consumer price index* (CPI).

The Riksbank's inflation target is formulated in terms of the *change in the consumer price index* (CPI). In December 1994 it was specified that the target refers to the rate of inflation in *an annual perspective* (Bäckström, 1994). It is not self-evident what "an annual perspective" can or should mean, or that the CPI is the best target variable.

Concerning the time perspective, one can choose – as is often done in the debate – to look at the change in the course of a calendar year; another common alternative is the series of 12-month change figures (the level each month compared with the same month a year earlier). A third alternative is to calculate the average of the 12-month changes over a period of 12 months, either for each calendar year or monthly as a moving average. To facilitate policy assessments, our Inflation Reports now regularly present both the series of 12-month changes and the moving 12-month average of these.

As regards the choice of the CPI, there are good grounds for formulating the inflation target in this way. As discussed earlier, inflation is costly partly because a high rate is associated with more uncertainty about the future value of money. It is then reasonable to try to stabilise the value of money in terms of the "consumption basket" that is most relevant for the average citizen. The CPI has been constructed to measure the development of prices for such a basket. People are also familiar with the CPI, an argument that can be seen as particularly important when building up confidence in a new type of monetary policy regime.

CPI does pose problems. One is that in the short run, a monetary policy tightening leads to an increase in estimated *housing costs.*

But the CPI does pose problems. One is that in the short run, a monetary policy tightening (a higher interest rate) leads to an increase in estimated *housing costs* and thus to a transient upward contribution to CPI inflation. The tendency for inflation to move in the "wrong" direction initially is a problem in the context of explaining monetary policy. This characteristic of the CPI need not be so troublesome, however, if it is realised that the immediate effect from housing costs is partly offset by other effects and that an interest rate increase will bring inflation down in the longer run. Over a business cycle, which may entail interest rate cuts as well as increases, monetary policy has no decisive effect on housing costs. An example of the mechanism at work when the interest rate is lowered is the period 1996–97, when inflation was well below the targeted rate; the Riksbank was criticised for this when one of the explanations was just the interest rate cuts.

Another type of problem is that the Riksbank neither can nor perhaps should counter all short-run fluctuations in the CPI. *International price impulses*, for example, can have major short-run effects on Swedish import and export prices which may pass through to the CPI. Such shocks have to be tolerated in practice by the Riksbank both because, as mentioned earlier, the policy effects are lagged and because trying to achieve a rapid return to the inflation target could be costly in terms of fluctuations in output. However, we have already discussed the need of flexibility when targeting inflation. Policy can be flexible when the target is formulated in terms of the CPI; the case for flexibility would also be valid with a different price index. The problem with the impact of international price impulses has more to do with the task of explaining (not to mention formulating) a flexible inflation-targeting policy than with the choice of the CPI as such.[15]

An inflation target that is formulated so that all tax effects are excluded would be liable to miss important elements of the inflation process.

Changes in *taxes and subsidies* are a similar case in that their immediate impact on the general price level may be greater than a judicious monetary policy can counter. The management of tax changes and other economic policy realignments is also a problem in that they are a component of overall economic policy, which includes monetary policy. It would presumably not be desirable if monetary policy were to try to counter all of the impact of tax changes on the general price level, just as it would not be if fiscal policy were to be directed so as to influence the registered rate of inflation in the very short run. The problems with inflation targeting in terms of the CPI are illustrated by the cut in VAT in the spring of 1995, partly with the aim of countering the increase in the CPI and thereby avoiding further interest rate increases (Persson, 1997). It should be underscored that there are no simple solutions to the treatment of taxes and subsidies. An inflation target that is formulated so that all tax effects are excluded would be liable to miss important elements of the inflation process.

Underlying inflation

In the countries with an explicit inflation target for monetary policy, the problem of defining the target variable has been tackled in a variety of ways (Berg, 1998). Many of the solutions exclude housing costs from the target's reference index. This reduces the risk of perverse short-run effects from interest rate adjustments. Indirect taxes and subsidies are sometimes excluded too. There are even instances of certain commodity prices being excluded, for example imported oil. A further alternative is to formulate escape clauses so that certain – extreme – shocks, which would permit to drive inflation off the target, are clearly specified in advance.

Whatever the particular solution, as monetary policy has to be forward-looking and therefore based on inflation forecasts, there is a need to distinguish

[15] The choice between specifying the inflation target in terms of consumer prices rather than domestic producer prices does have implications, however, for the expected fluctuations in output; cf. Svensson (1998*a*) and Bharucha & Kent (1998).

between CPI changes that stem from shocks with only *transitory* effects (disappearing before the target horizon has been reached) and shocks that are more permanent and thereby influence inflation expectations. As a rule, therefore, inflation-targeting central banks have chosen to calculate various indicators of *underlying* or *trend* inflation. This is intended to identify the component of price changes that can or should be influenced.

The Riksbank's approach to inflation targeting has gradually developed over time.

The Riksbank's approach to inflation targeting has gradually developed over time. It was made clear in general terms at an early stage that effects which were judged to be transient (leaving trend inflation unaffected) would be left aside when deciding the policy stance (Andersson & Berg, 1995). Bit by bit, different indicators of underlying inflation have been constructed and used in inflation reports, speeches, etc. This has been done primarily to describe the inflation process in a way that is relevant when assessing future inflation (constructing inflation forecasts). Another purpose has been to make it easier for interested persons outside the Riksbank to understand the development of inflation and thereby monetary policy. The indicators of underlying inflation have been useful, for example, in explaining more clearly why the Riksbank has been off target in terms of the CPI.

From this account it will be clear that choosing an index is not a straightforward matter, that the Riksbank has had and still has some problems with the target variable it has chosen but also that there are no simple, self-evident solutions. However, the fact that the Harmonised Index of Consumer Prices (HICP), which excludes interest expenditure, will provide guidance for monetary policy in EMU, is a reason for the Riksbank to attach greater importance to this particular index of inflation in the future.

The importance of the Riksbank's choice of an index or indexes should not be exaggerated.

Having said this, it should be added that the importance of the Riksbank's choice of an index or indexes should not be exaggerated. Monetary policy does not stand or fall by this. The differences between the CPI and various indicators of underlying inflation are not particularly great over a period of one to two years, at least not compared with the difficult assessments that the forecasting work and monetary policy itself still involve. Neither are the practical consequences of targeting the CPI rather than some indicator of underlying inflation presumably all that great.

Tolerance interval

The Riksbank's inflation target is specified together with a tolerance interval of ±1 percentage point. The width of the tolerance interval is closely linked to the question of how the target variable should be defined. The longer the target horizon and the less sensitive the chosen index to transitory effects, the smaller may be the need of an explicit tolerance interval.[16]

A tolerance interval may be useful in the assessment of monetary policy by the body to which the central bank is accountable, in our case the Riksdag.

There are several grounds for a tolerance interval. It can be seen as a way for a central bank to explain that, for reasons discussed above, it is not capable of keeping inflation exactly on target in the short run. A problem here, however, is that experience in Sweden and other countries shows that there are considerable difficulties even in keeping annual inflation inside an interval of ±1 percentage point.

A tolerance interval can also be regarded as a confidence interval in the sense of the statistical uncertainties in the inflation forecasts on which, because of the lagged effects, policy has to be based. Here, too, however, experience suggests that an interval of ±1 percentage point is too narrow to constitute a confidence interval in the conventional sense. The probability of the forecast missing the outcome by more than 1 percentage point is considerable.[17] Experience in Sweden in this respect does not differ from other countries.

Thirdly, a tolerance interval could imply that the central bank does not attach primary importance to keeping inflation in the centre of the interval. As long as inflation stays inside the interval, the bank may want to promote other goals, for example for production or employment. This is sometimes referred to as "opportunistic monetary policy" (e.g. Clarida et al., 1998a). In our opinion, however, this has not been a reason for countries that have chosen to surround their inflation target with a tolerance interval.

Finally, a tolerance interval may be useful in the assessment of monetary policy by the body to which the central bank is accountable, in our case the Riksdag (Sweden's parliament). Certain routines may be prescribed, for example, for the consequences when inflation moves outside the tolerance interval. In the United Kingdom, for instance, there is a rule requiring the Bank of England, as soon as

[16] This issue is also pertinent to the question of whether monetary policy should be guided by an inflation target or a price level target, since the price level is the sum of inflation over a series of periods.

[17] Cf. e.g. Jacobson et al. (1998). It should be borne in mind, however, that studies based on historical data (which are all that is available) may overestimate the future uncertainty in forecasts. Inflation-targeting policies may lead to inflation being not only lower but also more stable.

inflation is outside a tolerance interval, to write an open letter explaining why inflation is not on target.

This fourth reason is presumably the strongest. When a central bank is instructed to fulfil an explicit inflation target with a high degree of independence, it is important that the bank be publicly accountable. It may then be natural to stipulate an explicit tolerance interval to establish when at least a further explanation has to be provided. In such a situation there is presumably also a widespread awareness that a considerable margin of error is unfortunately unavoidable in monetary policy (though in the long run it should be possible, on average, to fulfil the inflation target); given such an insight into the conditions for monetary policy, the other motives for an explicit tolerance interval will be weaker.

The Riksbank has underscored the importance of assessing the inflation-targeting policy in a longer time perspective.

In the current situation there are hardly grounds for altering the formulation of our inflation target. The Riksbank has underscored the importance of assessing the inflation-targeting policy in a longer time perspective and demonstrated its ambition of explaining deviations from the target as clearly as possible. The tolerance interval and, above all, the Inflation Report have an important educational function here. The move to a more independent status for the Riksbank will accentuate the need of a clear, transparent process and guidelines for the assessment of monetary policy.

Practical forecasting problems

The interpretation of an explicit inflation target for monetary policy, the consideration that can be paid to other goals and the definition of the inflation target have now been discussed. In the day-to-day work, however, the main difficulty is not knowing what we are trying to achieve. Instead, in that policy has to be forward-looking, it is obtaining a good empirical foundation for assessing inflation's future path and the changes in the monetary stance that may be called for.

Inflation assessments are carried out with the aid of models which yield results that are then compared with each other.

Inflation assessments are carried out, at the Riksbank as well as at other central banks, with the aid of models and other procedures which yield results that are then compared with each other. For decisions about the level of the repo rate and at least as much for communicating the formation of policy, the information must also be arranged systematically in a consistent analytical framework.

In the simplest form of inflation model, inflation is seen as a result of capacity utilisation and inflation expectations. In a small, open economy such as Sweden's, the exchange rate is another important component of the inflation forecasts. The development of these three factors during the forecast period is therefore crucial in the assessment of inflation.

Capacity utilisation

As one way of following the development of capacity utilisation, the Riksbank estimates the output gap – the difference between actual and potential output. There are problems, however, with the definition as well as the measurement of potential output and thus the gap (e.g. Apel & Jansson, 1997), at the same time as this is a matter of great practical importance. Does the recent positive GDP trend, for example, mainly represent a traditional upward cyclical phase rather than a permanently enhanced growth rate? In the former case but not in the latter, this GDP trend implies rising inflationary pressure. The Riksbank has made some upward revisions in its estimates of potential output, partly in view of good and sustained increases in productivity as well as very moderate inflationary tendencies even with growth rates that are comparatively high. This has been accompanied by more or less parallel changes in appraisals of inflation by other observers. But that does not mean that the matter has been settled once and for all. Factors of a more temporary nature may have had a favourable combined effect on supply in the 1990s, for instance a "leap forward" in technology driven by the spread of IT and stronger international competition.

Another approach to the issue of resource utilisation involves estimating the level of employment or unemployment that is consistent with low, non-accelerating inflation. This, too, is a difficult task in that the labour market has presumably undergone rapid changes in the 1990s and also because, after a time, the level of unemployment by itself may affect the level of resource utilisation that is feasible. Conclusions about the extent to which the inflation process in Sweden has been influenced are difficult to draw because the empirical results are highly dependent on how the demand situation is specified (Berg & Lundkvist, 1997). There is considerable uncertainty about this even in a country such as the United States, where the question has been analysed over a long period, and economic policy has now focused on low inflation for almost two decades.

It should be noted, however, that inflation forecasts can be constructed without knowing either the size of the output gap or the equilibrium level of unemployment.[18] As indicated earlier, the Riksbank works in practice with numerous

[18] For the output gap see Jacobson et al. (1998) and for unemployment see Staiger et al. (1997).

approaches and indicators. For capacity utilisation, use is made, for example, of information from Statistics Sweden and the National Institute of Economic Research.

Inflation forecasts can be constructed without knowing either the size of the output gap or the equilibrium level of unemployment.

Inflation expectations

Considerable problems are likewise involved in gauging and assessing inflation expectations. Given certain assumptions, expectations of future inflation, interest rates, exchange rates and so on can be derived from prices in financial markets. However, information of this type has to be interpreted very cautiously. Many different types of information and theoretical assumptions are needed to discern whether, for example, rising long bond rates reflect rising inflation expectations rather than an (expected) increase in the real interest rate, for instance because investors are demanding higher compensation than before for risks.

Neither can the Riksbank simply adopt market expectations as its own forecasts and construct policy accordingly. The market's expectations may then become self-fulfilling. It is therefore important that the Riksbank does in fact develop its own forecasting methods.

Partly for this reason, the Riksbank uses surveys in which different market agents are asked directly about their views on inflation, wage trends and so on one or several years ahead. There are naturally risks with this material as well. There has been a tendency, for instance, for employee and employer representatives to provide tactical responses that are favourable for them. At the same time, inflation assessments by households have proved to be remarkably accurate, at least for a one-year horizon (Zettergren, 1997).

Thus, the assessment of inflation expectations is also like doing a puzzle. The principal pieces are the above: estimates based on price-setting in financial markets and survey data. Additional information is obtained by closely and continuously monitoring developments in the financial markets.

The assessment of inflation expectations is like doing a puzzle.

Exchange rate

When the exchange rate weakens, total demand tends to become stronger, which may heighten the risk of capacity restrictions. Exchange rate movements also affect consumer prices more directly via import prices. In this respect, however, the situation appears to have changed since the 1970s and '80s in that the pass-through from exchange rate movements has become smaller. Sweden shares this

The degree of international competition is affecting the feasibility of passing on exchange rate movements in prices.

experience with many other countries.[19] There are various explanations for the new pattern. One assumes that the degree of international competition is affecting the feasibility of passing on exchange rate movements in prices. Stronger competition in the import market and/or a weak development of import demand (as in Sweden in the early 1990s) can either result in a higher rate of rationalisation or oblige the exporters to absorb a part of the exchange rate fluctuations in their profit margins. It remains to be seen how permanent such processes will be.

Another explanation for the decreased pass-through from exchange rate movements may be that the pricing behaviour of firms has responded to the inflation-targeting regime as such as well as to the increased exchange rate volatility. Temporary shifts in exchange rates have become more common, and firms are adapting by refraining from adjusting prices immediately to the extent that would have been motivated if the shifts had been permanent.

Anyone who has tried to forecast exchange rates knows that the task is not simple. Still, it is something the Riksbank has to do because we require forecasts of inflation one to two years ahead.

In practice, a major concern in the exchange rate assessments is how permanent the present level of the rate will prove to be. For the longer perspective, the Riksbank has sought guidance in estimates of equilibrium exchange rates (e.g. Alexius & Lindberg, 1996; Jacobson et al, 1998; Jacobson & Nessén, 1998). In addition, the path of the exchange rate has been predicted in the light of the current tendency and information about economic activity, etc. When predicting the future path, it is also important to understand why the exchange rate is at its initial level. The reasons for this may provide an indication of whether, when and how the rate may change.

All forecasters – in Sweden as well as in other countries – have overestimated inflationary pressure in the 1990s.

To sum up, a general problem has been that all forecasters – in Sweden as well as in other countries – have overestimated inflationary pressure in the 1990s. One reason may be that total production capacity (and thereby the output gap) has been underestimated. Moreover, inflation has become unusually low in relation to a given level of unemployment and unutilised capacity. One

[19] For an overview see Goldberg & Knetter (1997) and for studies on Swedish import prices see Adolfson (1997) and Alexius (1997).

explanation for this is presumably just the monetary-policy realignment – along with other changes in stabilisation policy – towards a policy that attaches greater importance to price stability. In time this has affected the formation of expectations as expressed, for example, in wage formation. The magnitude of such effects of policy realignments is generally difficult to predict because changes in economic policy regimes are not particularly frequent. A further reason for inflationary pressure being overestimated by forecasters is that they overestimated the impact of exchange rate movements on prices.

Communication and transparency

A considerable amount of time and resources has been devoted to communication in recent years – the Riksbank has become more open. The adoption of an explicit inflation target, the need to establish its credibility and the aim of being as transparent and clear as possible in monetary policy are strongly interrelated. In simple terms, openness underscores the importance of doing the job properly, and such incentives, together with a clear formulation of the objective, are essential for credibility.

An explicit inflation target can be seen as a constraint on the central bank.

An explicit inflation target can be seen as a constraint on the central bank. Problems with credibility stem from the fact that, in a formal sense, undertakings are never irrevocable – political decisions can always be altered by taking new decisions. But some commitments are more binding than others. Formulating a monetary-policy target in explicit terms should normally[20] improve the chances of making the policy credible. With reference to monetary policy in the United States, Alan Blinder commented in words to this effect: "It is a reasonable requirement that people know at all times whether the Fed considers that inflation should be higher or lower than it is at present." As we pointed out above, however, there is no simple relationship between current inflation, the inflation target and interest rate policy. There may be reasons for accepting deviations of varying duration from the target. To avoid a loss of confidence in the long-term target on account of such deviations, people need to be in a position to judge the considerations behind the policy.

In many of the countries with an explicit inflation target, inflation reports are presented as a way of explaining and motivating the policy stance. In this way the central bank is at least committed to a particular interpretation of the historical

[20] The Bundesbank has indeed achieved high credibility without specifying its target all that explicitly.

picture. It then becomes more difficult for the central bank to justify its policy retrospectively on grounds that differ from those on which the policy was explicitly based. A number of independent observers have concluded that an explicit inflation target, with all that this means in the form of inflation reports and possibilities of assessing policy, creates more credible ties on monetary policy (e.g. Bernanke et al., 1998).

Greater openness, properly managed, is a natural component of monetary policy. If the Riksbank is able to present its arguments clearly, market agents and others who are dependent on the Bank's decisions will then be in a better position to assess new information and *foresee how the Bank will act.* This in turn should lead to fewer unnecessary movements in interest rates as well as generally less uncertainty in financial markets and the economy as a whole. Monetary policy will then be more economically efficient. Speaking somewhat drastically, one could say that the purpose of open, clear communication is to make the markets so familiar with the Riksbank that they would be capable of setting the interest rate on our behalf in the light of the available information about future inflation.

Interest rate decisions are important for the entire economy.

Another important, though somewhat different reason for monetary-policy transparency has to do with the function of the Riksbank in Sweden's political system. The Riksbank has been entrusted with great responsibilities that will become even greater, if possible, with statutory independence. Interest rate decisions, as well as decisions about payment system stability, are important for the entire economy. It is then reasonable to expect the Riksbank to *communicate clearly with its principal*, the Riksdag, explaining why it is acting in a particular way, what the alternatives are and the grounds for certain decisions. Only then is it possible for the principal to assess how the Bank is performing.

A further reason for openness is that communication is needed to promote *an understanding of what the Bank is doing* in society in general (legitimacy). Over a period of years in the past, it came to be believed, for example, that the problem of job creation had a simple solution – permitting higher inflation. That is not the case, as we noted earlier, and government has taken the consequences in altering the Riksbank's objective and working conditions. But the discussion lives on in society, and for the long-term success of monetary policy it is important that people in general appreciate the situation so that broad support is generated for low inflation and the need for an alert central bank.

A clear intellectual framework that is communicated openly also means a great deal for the internal work at a central bank. Doing away with a hush-hush attitude to outsiders makes franker internal discussions natural, too. Clear policy goals are also a help in focusing internal work and analysis on the relevant issues. The functions of the Riksbank are thus facilitated in a number of respects by a clear intellectual framework. An explicit inflation target has major advantages in this context, even though, as indicated above, this regime still poses problems that need to be solved. Some of these problems, for example the question of how to view the exchange rate, are genuinely difficult and therefore sometimes also lead to problems of communication.

A clear intellectual framework that is communicated openly also means a great deal for the internal work at a central bank.

Many of these issues will have to be considered in the coming year when the Riksbank acquires a new decision-making structure with an executive board. The plan is for the Riksdag to appoint a new Governing Board that will then appoint the members of the Executive Board, for staggered six-year terms, with the task of taking monetary-policy decisions, for example. Under these circumstances it is clearly important to step up the efforts to communicate policy and promote an understanding of it – a weaker direct link to the Riksdag makes it even more important to ensure that the actions of the Riksbank are understood in society in general.

One matter that is being discussed is whether the Riksbank should publish minutes of discussions in the Executive Board and/or how decision-makers have voted. One reason why this issue has attracted so much attention recently is that the new Bank of England legislation stresses the monitoring of how individual members have voted. Without taking up a position on this matter, we believe it may be meaningful to make a distinction between requiring accountability on the one hand and clarity or distinctness of policy on the other. As regards accountability, it is important for it to be possible to assess how members of the Executive Board have acted. Policy, however, can be clearly presented in the Inflation Report as well as in communiqués from meetings of the Executive Board, while for clarity it is less necessary to know how particular individuals have voted. A further consideration is the need to create an Executive Board that functions properly not only when it comes to making wise monetary-policy decisions but also, as a team, in the Riksbank's effective management.

Concluding remarks

Experience in Sweden of monetary policy with an inflation target has been good. The economy has made a rapid recovery in recent years, at the same time as inflation has remained low. Moreover, there is now considerable support for the general features of the policy, and the ongoing debate is not rancorous but constructive. Notwithstanding the general support, there has been and will continue to be a lively monetary-policy debate; anything else would be abnormal. As the economy and inflation prospects change, there will always be reasons for discussing the actions of the Riksbank.

A major advantage with an inflation-targeting policy is that an explicit target forces the central bank to make its policy transparent.

A major advantage with an inflation-targeting policy which is often pointed out in the international debate is that an explicit target forces the central bank to make its policy transparent. A distinct target, moreover, makes it easier to explain the policy – what can and cannot be done. With a distinct goal it is also easier to assess the outcome of policy and thereby hold the central bank accountable. It will be necessary to present a sound foundation for decisions.

There are a number of debatable issues in the conduct of monetary policy; uncertainty about the factors behind inflation and its future path, together with concern about credibility or economic stability, make it difficult to arrive at a balanced appraisal of the situation. Questions to do with the target horizon, target variable and tolerance interval require further discussion. In these and many other matters we can learn from experience in other countries. But this article has also been written as an invitation to Swedish economists to participate in a debate that is more active and goes deeper into these aspects.

There are discussions from time to time, inside as well as outside central banks, about the appropriate level of openness and clarity. In our opinion, experience in Sweden to date and the remaining problems show that the limits to openness in practice are not "political" in the sense of any strategic reasons for the central bank to conceal information from the public. The difficulties lie instead in the task of presenting all the problems that policy encounters in a simple manner. The limits to openness and clarity are accordingly set, not by our ambitions but by our knowledge and ability.

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