Inflation targeting: much ado about nothing (new)

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Paper presented at the annual meeting of the
Ausschuss für Geldtheorie und Geldpolitik des Vereins für Socialpolitik

25 February 2000

1. Introduction

After its introduction by the Reserve Bank of New Zealand in 1989, the concept of inflation targeting is now practised by an increasing number of central banks all over the world[1]. Many academics regard this concept as an "apparent success" (Svensson 2000) and recommend it also for the European Central Bank[2] and the Federal Reserve (Bernanke et al. 1999):

> "We conclude that inflation targeting is a highly promising strategy for monetary policy, and we predict that it will become the standard approach as more and more central banks and governments come to appreciate its usefulness." (Bernanke et al. 1999, p. 308)

This view is difficult to reconcile with the highly successful monetary policy in the United States under the aegis of Alan Greenspan which lacks a clear conceptual framework. The need for an inflation targeting is also not obvious in the case of the ECB which has been able to keep inflation and inflationary expectations at very low levels in spite of much public scepticism about the new currency.

In this paper, I will start with a short presentation of the main elements of inflation targeting. I will show that this term includes two different concepts of monetary policy. To many observers inflation targeting simply means a medium-term stability-oriented monetary policy. To others inflation targeting in addition requires an explicit inflation forecast and a specific monetary policy rule. My paper will mainly discuss this second variant. First, the virtues of a stability-oriented monetary policy are not very controversial today. Second, in the context of the ECB it is of great interest whether an inflation forecast and an "inflation-targeting" monetary rule could improve the transparency of its monetary policy. For that purpose, the contribution of an announced inflation forecast to monetary policy transparency has to be analysed in detail. In addition, the rationale of a "targeting rule" (Svensson) has to be assessed within the framework of the traditional discussion on "rules versus discretion". Finally, the performance of inflation targeting countries will be analysed in comparison with the results of monetary policy other countries.

2. What is "inflation targeting"?

In their comprehensive study on "inflation targeting" Bernanke et al. (1999) give the following definition:

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[1] Canada (February 1991), United Kingdom (October 1992), Australia (1993), Sweden (January 1993), Finland (February 1993), Spain (November 1994).

[2] See also Bofinger (1999).

> "Inflation targeting is a framework for monetary policy characterised by the public announcement of official quantitative targets (or target ranges) for the inflation rate over one or more time horizons, and by explicit acknowledgement that low, stable inflation is monetary policy's primary long-run goal. Among other important features of inflation targeting are vigorous efforts to communicate with the public about plans and objectives of monetary authorities, and in many cases, mechanisms that strengthen the central bank's accountability for attaining those objectives." (Bernanke et al. 1999, p. 4)

This definition more or less circumscribes what in above all Germany is since long understood as a "stability-oriented monetary policy". It is much less demanding than a definition that can be found in Svensson (2000):

> „Inflation targeting is characterised by, first, an explicit numerical inflation target. The inflation target is pursued in the medium run, with due concern for avoiding real instability, for instance, in the output-gap; that is, inflation targeting is 'flexible' rather than 'strict'. Second, due to the unavoidable lags in the effects of instruments on inflation, the decision framework is in practice 'inflation-forecast targeting' (...). Third, communication is very explicit and to the point; policy decisions are consistently motivated with reference to published inflation and output(-gap) forecasts." (Svensson 2000, p.1)

An additional element of "inflation targeting" as it is presented in the study by Bernanke et al. is a preference for an inflation target that is set by "elected officials":

> "Because ultimately policy objectives in a democracy must reflect the popular will, they should be set by elected officials." (Bernanke et al. 1999, p. 312)

This case for "*goal dependence*" (Fischer and Debelle 1995) is compatible with the fact that in all countries that practice inflation targeting (Australia, Canada, New Zealand, Sweden, United Kingdom) the final goals of monetary policy are set by the government. But as a normative element it is more difficult to understand since the authors demonstrate convincingly "the adverse effects of even moderate rates of inflation" (Bernanke et al. 1999, p. 19). Thus, it would make little sense for the society to set objectives for inflation on a discretionary basis instead of entrusting an independent central bank with the permanent task of achieving price stability. As far as the execution of the inflation target is concerned, Bernanke et al. (1999) favour "instrument independence", which means that the central bank should have the sole responsibility for the setting of interest rates.

The different elements of inflation targeting according to the definitions by Bernanke et al. and Svensson are summarised in Table 1.

Table 1: Alternative definitions of inflation targeting

	Bernanke at al.	Svensson
1) Price stability as the main target of monetary policy	Yes	Yes
2) Announcement of a numerical target	Yes	Yes
3) Medium-term target	Unclear („one or more time horizons“)	Yes
4) Intensive communication with the public	Yes	Yes
5) Specific monetary policy rule	Unclear	Inflation-forecast targeting
6) Published inflation and output forecasts	Not required	Yes
7) Target set by government („goal dependence“)	Yes	Not required
8) Instrument independence	Yes	Yes, but not explicitly addressed

Both definitions include rather uncontroversial elements which make up the core of stability-oriented monetary policy strategies in many countries. This applies above all to the Bundesbank and the ECB. The first four elements of Table 1 can be found in the Bundesbank's policy at least since 1974. As Table 2 shows, for the derivation of its monetary target the Bundesbank has annually announced a "normative inflation rate" (or "unavoidable price increase") which can be regarded as a short-term inflation target in addition to the long-term low-inflation target that was set by Article 3 of the Bundesbank Act.

Table 2: Implicit inflation target of the Bundesbank
(Announced as the Bundesbank's normative inflation assumption for its monetary targets)

Year	Implicit target	Year	Implicit target	Year	Implicit target
1975	6.0	1983	3.5	1991	2.0
1976	4.5	1984	3.0	1992	2.0
1977	3.5	1985	2.0	1993	2.0
1978	3.25	1986	2.0	1994	2.0
1979	3.0	1987	2.0	1995	2.0
1980	4.0	1988	2.0	1996	2.0
1981	3.75	1989	2.0	1997	1.5-2.0
1982	3.5	1990	2.0	1998	1.5-2.0

Source: Bundesbank, Monthly Reports

From the beginning of its operations the ECB has announced a numerical inflation target. It is based on Article 105 (1) of the EC Treaty:

> "The primary objective of the ESCB shall be to maintain price stability. Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Community with a view to contributing to the objectives of the Community as laid down in Article 2."

In its stability-oriented monetary policy strategy[3] the ECB has given a precise formulation of its target:

> "Price stability shall be defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%".[4]

And:

> "Price stability is to be maintained over the medium-term."

In contrast to the practice of the Bundesbank and the ECB, the Federal Reserve has never made a public statement about its concrete inflation target. But the performance of the United States' monetary policy since 1983 shows that the Federal Reserve is able and willing to pursue a policy which maintains a low inflation rate over the medium term.

The more controversial elements of inflation targeting are the *publication of an inflation forecast* and the role of *intermediate targets*. The Bundesbank never published its inflation forecasts. The same applies to the Federal Reserve. While the ECB has not yet published detailed inflation and output forecasts, it has made a statement in its December 1999 bulletin, which comes very close to it:

> "Nevertheless, as the strengthening of economic growth gathers pace, the rate of increase in consumer prices is expected to rise over the forecast horizon to reach a rate of above 1½% towards the end of 2001." (ECB 1999b, p. 42)

A major difference between the Bundesbank's and the ECB's approach on the one hand and inflation targeting as it is defined by Svensson is the role of *intermediate targets*. While the Bundesbank set annual targets for the money stock M3, the ECB has announced "reference values" for M3 which can be regarded as a weak form of monetary targeting, especially as the ECB uses this reference value as a main pillar of its "stability-oriented monetary policy strategy." The definition of inflation targeting by Bernanke et al. does not prescribe a specific intermediate target. However, when discussing the Bundesbank's and the Swiss National Bank's strategy the authors evaluate them as "'hybrid' inflation targeters and monetary targeters" (Bernanke et al. 1999, p.41). This is more in line with Svensson's definition of inflation targeting that excludes all strategies that do not use the inflation forecast as intermediate target. Again, the monetary policy of the Federal Reserve which has abandoned monetary targets already in 1982 would not qualify as inflation targeting.

3. The rationale of inflation targeting

While monetary targeting had been prepared by an intensive academic discussion, inflation targeting was developed mainly as an ad-hoc solution. After traditional intermediate targets (money stock, exchange rate) had become less and less reliable, governments and central banks had to develop a new framework for monetary policy. In the case of Sweden and the United Kingdom the unexpected ERM crisis even made it necessary to find a new strategy almost over night.

[3] The strategy was published in ECB Press Releases of 13 October 1998 and 1 December 1998. It is discussed in detail in ECB (1999).

[4] The ECB (1999, p. 46) has also clarified that "the use of the word *'increase'* in the definition clearly signals that deflation, i.e. prolonged declines in the level of the HICP index, would not be deemed consistent with price stability."

This explains the quite pragmatic approach of inflation targeting. As already mentioned, at least from a German point of view the elements 1) to 4) and 8) of "inflation targeting" seem neither very controversial nor very innovative. This also applies to the underlying theory of a stability-oriented monetary policy. Therefore, I will not discuss the merits of low inflation or the fact that there is no long-run trade-off between inflation and unemployment.[5] The more interesting question is whether inflation targeting has something more to offer than such obvious virtues of stability-oriented monetary policy. This leads to the controversial elements of inflation targeting:

- Is it useful that a central bank makes regular public announcements of its forecast for inflation and real GDP?
- If inflation targeting excludes traditional intermediate targets like the money stock and the exchange rate, in which way can it be regarded as a rule for the determination of interest rates or interest rate paths that make it possible to achieve the inflation target?
- Or in other words: What characterises the "conceptual structure" (Bernanke et al. 1999, p. 6) by which inflation targeting is supposed to exert "discipline" on central banks so that it can be regarded as a form of "constrained discretion"?

3.1 Two transmission channels

For an assessment of these topics it seems necessary to discuss briefly the transmission process of monetary policy. It is widely agreed that the details of this process are still not very well understood. In the words of Otmar Issing:

> "With regard to the operation of the single monetary policy, we can only safely say that we know, at best, the broad contours of the euro-area transmission mechanism right now. What we can say for sure, however, is that there is a considerable likelihood that the way monetary policy is transmitted may change making the task of the ECB even more difficult." (Issing 1999)

An almost similar assessment is made by an "inflation targeter" like Mervyn King:

> "(...) in the short run, before policy has fully worked through, the effect of monetary policy on real variables is extremely uncertain because the transmission mechanism is neither sufficiently well understood nor sufficiently stable over time for policy easily to target real variables." (King 1999, p. 12).

It as astonishing that in spite of these obvious uncertainties many central banks have been able to keep inflation rates at relatively low and stable values for prolonged periods of time. This applies above all to the period between 1952 and 1967. Under the leadership of the United States (with an average inflation rate of 1.4 %) the world economy experienced a long period of price stability. In the 1990s the average inflation was 3.0 % in the United States and 2.4 % in Germany (with similarly low levels in many other ERM countries). This good performance of many central banks indicates that there must be a relatively simple and robust transmission channel of monetary policy.

In the literature two main transmission channels can be found: the "aggregate demand channel" and the "expectations channel". I will present them as briefly as possible.

[5] For a discussion of these issues see Bernanke et al. (1999, p.10-21).

The *aggregate demand channel* is based on the standard textbook macroeconomic model. A very simple model for this variant of the transmission process is presented by Svensson (1997).

(1) $\pi_{t+1} = \pi_t + \alpha_1 y_t + \alpha_2 x_t + \varepsilon_{t+1}$

(2) $y_{t+1} = \beta_1 y_t - \beta_2 (i_t - \pi_t) + \beta x_t + \eta_{t+1}$

(3) $x_{t+1} = \gamma x_t + \theta_{t+1}$

The inflation rate π_t is determined by real (log) output y_t (relative to potential output) with a lag of one year, while real output can be targeted with a short-term interest i_t rate with another one-year lag. x_t is an exogenous variable. ε_t, η_t and θ_t are i.i.d. shocks in year t that are unknown in year t–1. The coefficients α_1 and β_2 are assumed to be positive; the other coefficients are assumed to be nonnegative. γ and β_1 fulfil in addition $\gamma<1$, $\beta_1<1$.

Because of the two-year lag between interest rate changes and the inflation rate, a central bank that wants to target the inflation rate needs an inflation forecast for two years ahead. In the words of Svensson (1997):

> "(...), the repo rate in year t should be set so that the forecast of the one-year 'forward' inflation rate from year t+1 to year t+2 conditional upon information available in year t equals the inflation target. (...) Thus the two-year inflation forecast can be considered an explicit intermediate target." (Svensson 1997, p. 1118)

Therefore, a central bank's inflation forecast is the main determinant of short-term interest rates which explains why Svensson prefers the term "*inflation forecast targeting*" over the standard term "inflation targeting". It is obvious that the aggregate demand channel implies a rather activist monetary policy. In order to keep inflation close to the target level, a central bank has to follow a Keynesian demand management policy which has to offset all shocks that are created on the demand and the supply side. Thus, this channel is very difficult to reconcile with the "medium run" orientation which Svensson seems to regard as an essential feature of inflation targeting. Given the uncertainties about the transmission process in the short-run it would be also surprising that this transmission channel the main explanation for rather stable and low inflation rates over time.

This leads to the alternative transmission channel: the *expectations channel*. It explains inflation mainly with expectations about prices in the future. Equation (1) can formulated as a very popular variant of the expectations channel:

(4) $\pi_t = \pi_{t+1}^e + \alpha_1 y_t + \alpha_2 x_t + \varepsilon_{t+1}$

A main problem with this approach is that it assume completely flexible prices. While this is true for many assets prices, prices for consumer goods, services and labour are much less flexible. Because of transactions costs wages, prices for rents and leases and many other prices are adjusted only once a year or even less infrequent. This gives to price rigidities in many areas of the economy. Thus, although prices are determined by expectations they affect the actual inflation rate always with some lag. This leads to an alternative reformulation of equation (1). As the prices in t+1 are determined by the contracts and pricing decisions in t which were made on the basis of inflation expectations in t for period t+1:

(5) $\pi_{t+1} = \pi^e_{t+1}$.

If this is inserted in equation (1) we obtain

(6) $\pi_{t+1} = \pi^e_{t+1} + \alpha_1 y_t + \alpha_2 x_t + \varepsilon_{t+1}$.

The concrete character of this equation depends on the way of how expectations are formed. A very simple, but empirically very relevant hypothesis are *static expectations*:

(7) $\pi^e_{t+1} = \pi_t$

It is obvious that this hypothesis leads back to equation (1). Thus, the aggregate demand channel in the Svensson model contains an implicit expectations channel. The fact that many empirical studies come to the result that a simple random-walk leads to a very good forecast for the inflation rate[6] is an important explanation for the good fit of this and similar models (Svensson and Rudebusch 1999). Of course expectations could also be modelled as adaptive or rational.

If the Svensson model is interpreted as a variant of an expectations channel, it allows a relative simple explanation for the rather good performance of many central banks. Once a situation is reached with a widespread expectation that monetary policy is able and willing to generate a low inflation rate ("low-inflation equilibrium"), all future-oriented nominal contracts are based on a low inflation component so that future wage and price increases will in fact be low. It is obvious that this mechanism has a self-stabilising tendency. If the public is convinced of having a stability-oriented central bank, temporary deviations of the inflation rate are not regarded as a sign of incompetence or a deliberate inflation policy. Thus, expectations remain unchanged which allows to regain the original low inflation rate. In contrast to the aggregate demand channel, the expectations channel calls for a more passive approach of monetary policy. If a central bank has reached a low-inflation equilibrium, it can adopt a rather passive attitude which is often circumscribed by the term "interest rate smoothing".

An important difference between the two channels is the choice of an *intermediate target*. In contrast to the aggregate demand channel, the expectations channel uses the inflation expectations of the private sector as its intermediate target. Thus, this approach could be labelled as "*inflation expectations targeting*". Ideally the private sector sets inflation expectations identical to the central bank's inflation target:

(8) $\pi^e_{t+1} = \pi^*$.

As a result equation (6) becomes:

(9) $\pi_{t+1} = \pi^* + \alpha_1 y_t + \alpha_2 x_t + \varepsilon_{t+1}$.

This situation characterises a "credible" central bank and the expectations channel explains why "*credibility*" has become such an important concept of monetary policy. Without credibility the public is always confronted with the risk that a central bank is either incompetent or

[6] See Haldane (1995, p. 253) summarising the results of a conference as follows: "More than one representative noted that, in practice, projections do little better than a random-walk – a 'no-change' forecast – in predicting inflation over the short-run." For Germany see also Döpke and Langfeldt (1995).

not willing to pursue price stability or both. Thus, four different types of central banks are possible:

Table 4: Four types of central banks

	Central bank is competent	Central bank is incompetent
Central bank is stability oriented	A	B
Central bank is not stability oriented	C	D

For a type A central bank it is very important to be perceived correctly because misperceptions about its true nature lead to $\pi^e_{t+1} > \pi^*$. Via the expectations channel such a lack of credibility would unavoidably lead to inflation in the following year. Of course, it can counteract such a situation with higher interest rates, but this would require a recession and affect inflation only after two years. This explains why type A central banks have such high interest in credibility of their policy.

There are three mechanisms by which a central bank can influence its credibility:

- a stability oriented performance in the past which induces the private sector to rely on adaptive expectations (*reputation*);
- a *transparent* monetary policy framework which indicates that the central bank has "nothing to hide" and is willing to undergo an effective outside evaluation of its policy;
- a limitation of its room for manoeuvre by voluntarily adopting a *monetary rule*;
- a restrictive interest rate policy via the aggregate demand channel which signals to the private sector that the central bank's loss function gives a higher weight to a low inflation rate than in the past; the high costs of this strategy are a main reason for the use of communication technologies.

Thus, the expectations channel provides an important theoretical justification for inflation targeting. With the public announcement of a numerical inflation target and of inflation and output forecasts this approach relies heavily on commitment technologies. In addition, especially by Svensson is also regarded as a monetary rule. It is obvious that the need for such technologies is especially high for central banks with a low reputation. In fact all inflation targeting central bank started the new concept after a period with relatively high inflation rates (Table 3).

Table 3: Inflation performance at the beginning of inflation targeting

Country	**Beginning of inflation targeting**	**CPI inflation in last five years**	**CPI inflation in Germany in the same period**	**CPI inflation in the United States in the same period**
Australia	1993	5.3	3.1	4.3
Canada	1991	4.5	1.4	4.0
New Zealand	1990	11.3	1.3	3.6
Sweden	1993	7.1	3.1	4.3
United Kingdom	1992	6.4	2.1	4.4

Source: Jonsson (1999); OECD Economic Outlook

3.2 Inflation forecasts and the transparency of monetary policy

This leads to the question whether an inflation forecast that is published by a central would increase the transparency of its monetary policy. Like many proponents of inflation targeting Buiter (1999) is convinced that this is the case:

> „It is key for the proper functioning of the target-structure-performance transparency, that the constituency at least know the ECB's own view of the transmission mechanism and the ECB's own assessment of the prospects for inflation. While a minority of well-informed constituents may be able to articulate and develop their own views of the transmission mechanism and of the forces driving inflation, the ECB's own view on these issues must be in the public domain if the bulk of constituents are to be able to have any means of judging whether good (bad) performance in relation to the target is due to good (bad) luck or good (bad) judgement." (Buiter 1999, p. 19)

For a discussion of these issues it is important to note that even without a published inflation forecast by the central bank several outside forecasts by international institutions, national research institutes and many private institutions are always available. Thus, the question of publishing an inflation forecast boils down to two alternative communication strategies:

- A central bank explains its policy measures by referring to all relevant indicators, but leaves it up to other institutions to publish a numerical inflation forecast. Such a strategy which has been followed by the Bundesbank and the Federal Reserve has the advantage that the central bank and the broader public can use the outside forecasts as an important performance criterion. Low inflation forecasts and a low variance of the individual forecasts would indicate a competent and transparent monetary policy that aims at price stability.
- A central bank produces its own inflation forecast and explains its policy decisions mainly with reference to changes in its forecast. This approach has been adopted by the inflation targeting central banks.

Thus, the case for publishing inflation forecasts depends mainly on the quality of outside forecasts. If they are as good or even better than the forecasts by a central bank, a publication of the latter would be redundant. For a comparison of the inflation forecasts by a central bank and by other institutions the following aspects have to be discussed:

- availability of data and models, technical competence of forecasting institutions,
- public access to forecasts,
- objectivity of forecasts, and
- type of the forecast
- negative side effects of forecasts.

As far as the availability of data, models and the technical competence is concerned, it seems not very plausible that a type A or C central bank forecast is consistently better than the forecasts of other institutions. All relevant monetary data are published almost immediately after they have been compiled by the central bank. In addition, data on monetary aggregates are of limited use for short-term inflation forecasts. Data on interest rates are publicly available without any delay. All forecasting models are public knowledge. Thus, there is no reason to assume that the markets would lack "*economic transparency*" without a published forecast.[7]

[7] Geraats (1999, p. 21) defines economic transparency as "public access to all economic information pertinent to the central bank's decisions, with the exception of the central bank's unobservable preferences."

The competence of central bank research staffs is certainly very high, but there is no reason where their forecasts should be better than those of other institutions and especially than an average of outside forecasts. If the public is in doubt of the competence of a central bank (type B or D central bank), outside forecasts are always more important.

If the outside forecasts are regarded as the main benchmark for a central bank's performance, it is important that their results are at least as available as a central bank's forecast. In fact, the ECB as well as the inflation targeting central banks provide detailed information on outside forecasts as well as on surveys and on expectations that are embedded in financial market data (yield structure, interest rate differential between indexed bonds and other bonds, long-term bond yield). For the assessment of the transparency of monetary policy not only the levels of such forecasts but also the variance of the individual forecasts are important. Very divergent outside forecasts would indicate that the monetary policy stance is perceived in quite different ways which indicates a lack of transparency. Thus, if central banks are required to report intensively on all kinds of outside forecasts, the "bulk of constituents" is able to identify in time whether a central is able to reach its targets.

While there are no clear reasons why outside forecasts should be worse than a central bank forecast, the opposite is cannot be excluded. In the case of a type B or D central bank the forecast would certainly be biased. If a central bank intends to generate an employment effect, it has to announce a low inflation target and a low inflation forecast. After nominal nominal wages are set, it would start an inflationary policy. Of course, the existence of outside forecasts would limit the range of cheating, but an "inflationist" central bank would aim at the lowest forecast possible. This shows the problems of producing a performance criterion by an institution that is to be evaluated.

Another serious problem of an inflation forecast that is published by a central bank is that such an institution would have to forecast its own behaviour. "Given that the MPC (Monetary Policy Council; P.B.) cannot sensibly forecast its own future policy reaction function" (Vickers 1998, p. 371), *conditional* forecasts are required. In the United Kingdom they are based on the simple assumption of constant interest rates up to the two-year horizon. While this approach is technically correct, it is doubtful whether it would increase the public understanding of monetary policy.

For instance, in April 1999 the ECB's main refinancing rate was lowered to 2.5%. Maintaining such a very low level for the next 24 months would certainly have led to a rather high inflation at the end of the two-year period. Nevertheless, there was also no need to increase the repo rate for the time being. Therefore, the publication of a conditional inflation forecast would have created unnecessary inflation fears in the public especially as it is very difficult to communicate the rationale of this approach. The use of such conditional forecasts would also have contributed very little to an understanding of the ECB's subsequent interest rate increases as the conditional inflation forecast was still too high.

Thus it would only make sense to use a forecast conditional on *interest rate paths*. This would require that a central bank announces ex-ante what interest rate policies it intends to pursue in the future. Given the uncertainties of the monetary policy transmission process in the short-term such a pre-commitment would imply permanent revisions of the interest path that would undermine the reputation of a central bank. In addition, the specific nature of conditional forecasts impairs the comparison with outside (unconditional) forecasts which can also have negative effects on a central bank's reputation.

Finally, it is important to note that an inflation forecast that is published by a central bank is different from a weather forecast that is provided by a meteorological institute. [8]While weather forecasts have no impact on the weather, a published central bank forecast could have a direct impact on the economic process above all on wage negotiations. Such effects are especially dangerous if a central bank announces an inflation forecast that is higher than outside forecasts. While the opposite situation would be mainly regarded an attempt of a type B or D central bank, a high inflation forecast could be regarded as a quasi-official forecast that manifests itself in higher wage increases and higher inflation. Of course, the central bank can combine such a forecast with an increase in interest rates, but as the "aggregate demand channel" has a two year lag until it affects the inflation rate, the effects via the "expectations channel" cannot be avoided.

The expectations channel also shows that a published forecast could lead to circularity. IT is based on the realistic assumption that the central bank has to publish an inflation forecast *before* wage contracts are made. Thus, if a central bank wants to forecast future inflation (π^f_{t+1}), it mainly has to forecast future nominal wages (w) :

(10) $\pi^f_{t+1} = f\ (w_{t+1})$.

But the inflation component of wage negotiations depends in turn on the expectations about monetary policy and the future inflation rate:

(11) $w_{t+1} = f\ (\pi^e_{t+1})$.

If the central bank has published a (conditional) inflation forecast that is higher than outside forecasts, it seems very likely that it will be used as a quasi "official forecast" by trade unions and employer associations for their expectation about the inflation rate:

(12) $\pi^e_{t+1} = f\ (\pi^f_{t+1})$.

As a result, the central bank's inflation forecast becomes circular:

(13) $\pi^f_{t+1} = f\ (\pi^f_{t+1})$.

All in all, it is not obvious that the publication of an inflation forecast by a central bank would increase the transparency of monetary policy (Table 5). There is no reason why a central bank should produce better forecasts than outside institutions. But there is a risk that forecasts by a central bank are

- flawed because of an incompetent central bank,
- biased by an inflationist central bank,
- are misunderstood because of their conditional nature,
- or self-fulfilling via their effect on private expectations.

[8] For a different view see Haldane (1997).

Table 5: Comparison of central bank inflation forecast (CBF) and outside inflation forecasts (OF)

Criterion	Result
Availability of data and models, technical competence of forecasting institutions	CBF ≈ OF (type A and C) CBF<OF (type B and D)
Public access to forecasts,	CBF = OF
Objectivity of forecasts	CBF = OF (type A, B and D) CBF<OF (type C)
Type of the forecast	CBF<OF
Negative side effects of forecasts	CBF<OF

Thus, for a comprehensive ex-ante assessment of a central bank's policy it is sufficient and necessary to have a good survey of outside forecasts.[9] They exactly perform the functions that Svensson (2000) attributes to inflation targeting:

> "These practices of inflation-targeting banks allow outside observers to scrutinise the central bank's analysis and forecasts and then judge whether the policy decisions are appropriate, given the goals and available information." (Svensson 2000, p. 4)

The information value of outside inflation forecasts is increased if it includes opinion polls, financial market indicators of inflation expectations and surveys on the inflation component of recent wage agreements. Divergences of such forecasts from the announced target do not require an automatic response by the central bank, but they would force a central bank to explain their causes. In the words of Bernanke and Woodford (1997):

> "Private sector forecasts that disagree with that of the central bank might well be matters that would require comment on the part of the central bank, but one could accept an explanation on part of the central bank of how its own forecasts are made as sufficient demonstration of a good-faith effort to achieve the inflation target. In such a case, the fact that publicly available inflation forecasts play an important role in ensuring central bank accountability would not in any way require that the central naively target those forecasts." (Bernanke and Woodford 1997, p. 682)

A central bank's testimony on private inflation expectations would show at a very early stage whether a deviation between expectations and target

- is due to a temporary demand or supply shock to which the central bank does not want to react because of its medium-term orientation,
- has been caused by one-time effects like an increase in value-added taxes,
- has been caused by an inadequate interest rate policy which would require a correction, or
- can be explained by a difference between the central bank's forecast and outside forecasts.

[9] See also Goodhart (1999): "It is the judgement of markets, and of respected independent forecasters, whether, or not, the authorities have got it right that really approves the ex ante accountability, not so much the publication of internal forecasts."

The last situation is the only reason for publishing a central bank forecast. It requires that the central bank is convinced that the outside forecasts are obviously flawed.

3.3 Inflation targeting as a monetary rule

In the view of Svensson, inflation targeting is not only the announcement of an inflation target and an inflation forecast but also a "monetary policy rule". He defines a monetary policy rule in very general way as a "prescribed guide for monetary policy conduct" (Svensson 1998, p. 6).

In monetary theory the term "rule" is understood above all as the opposite of "discretion" or "authorities" (Simons 1936). Webster's Dictionary defines discretion as the "liberty or power of deciding or acting without other control than one's own judgement". As already mentioned, the case for rules that are adopted voluntarily is based on the assumption that a such a limitation can contribute to a central bank's credibility. In the view of Simons a rule has to fulfil the following criteria:

> "In a free enterprise system we obviously need highly definitive and stable rules of the game, especially as to money. The monetary rules must be compatible with the reasonably smooth working of the system. Once established, however, they should work mechanically, with the chips falling where they may. To put our present problem as a paradox - we need to design and establish with the greatest intelligence a monetary system good enough so that, hereafter, we may hold it unrationally - on faith - as religion, if you please." (Simons 1936, pp. 13)

And:

> "To assure adequate moral pressure of public opinion against legislative (and administrative) tinkering, the monetary rules must be definite, simple (at least in principle), and expressive of strong, abiding, pervasive, and reasonable popular sentiments." (Simons 1936, p. 29)

In fact economists and central banks have always tried to design relatively simple and robust rules:

- at level of operating targets: Taylor rule
- at the level of intermediate targets: monetary targeting, exchange rate targeting.

Svensson (1998) calls the first set of rules "instrument rules" although the term "*operating-target rules*" would be more correct.[10] The second group of rules is labelled "*intermediate-target rules*". The innovative element in Svensson's work is the idea to base a rule on the final targets of monetary policy. In principle the correct term for this rule would be "*final target rule*". Svensson prefers the term "targeting rules" which means "at the most general level, the assignment of a particular loss function to be minimised" (Svensson 1998, p.8).

As the quote by Simons shows, the main function of a "rule" is to facilitate a central bank's internal decision processes. In addition to this internal function a rule can be announced to the public which can be regarded as a commitment technology. If the public is informed about the guiding principles of monetary policy it can control at any moment whether monetary policy

[10] The short-term interest rate is not an instrument of monetary policy but an operating target which is controlled by a central bank's instruments.

is compatible with its announced targets. Svensson (1998, p. 8) understands his targeting rule in this sense:

> "(...) targeting rules (...) have the potential to serve as a kind of commitment (namely a commitment to a loss function, although it is still minimised under discretion)."

The main problem of Svensson's approach has been identified by Milton Friedman a quarter of a century ago:

> "As a result, we cannot predict at all accurately just what effect a particular monetary action will have on the price level and, equally important, just when it will have that effect. Attempting to control directly the price level is therefore likely to make monetary policy itself a source of economic disturbance because of false stops and starts." (Friedman 1968, p. 15)

Although monetary theory has made some progress since 1974, it is still true that the knowledge about the short-term effects of monetary policy is rather limited. This explains why no central bank in the world has mechanically followed monetary targeting or a simple Taylor rule although the latter has some quite attractive features (Levin et al. 1999). Even in the Bundesbank's reaction function monetary growth has only been of minor importance (Clarida and Gertler 1996, Schächter 1999). The Taylor rule has some influence on interest rate policies, especially in the case of the Bundesbank (Deutsche Bundesbank 1999), but Svensson is certainly right if he states:

> "In practice, no central bank follows an instrument rule, either explicit or implicit." (Svensson 1998, S. 7)

This also applies to the ECB, which seems to follow neither monetary targeting nor a Taylor rule. (Chart 1 and 2).

Chart 1: Taylor rate and money market rate

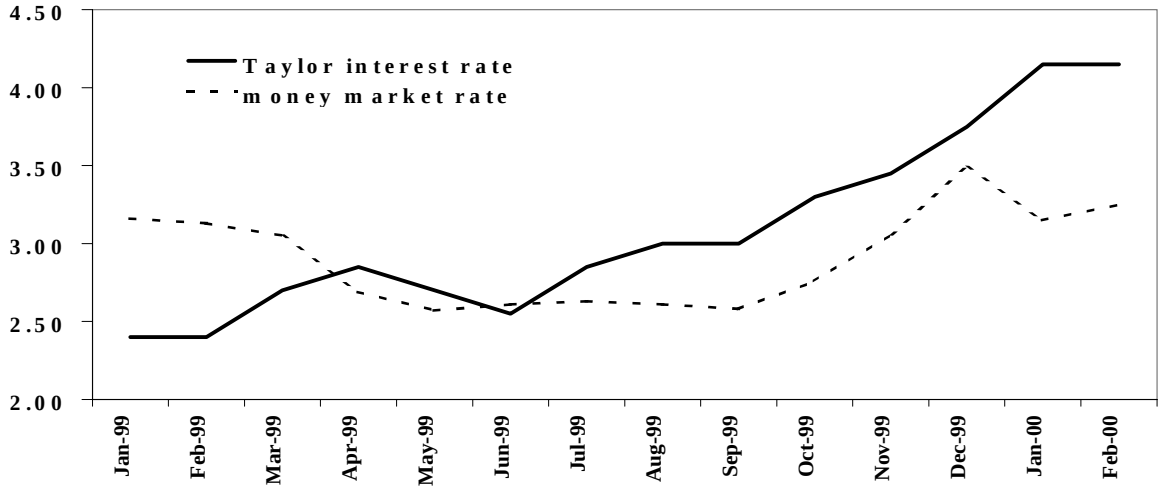
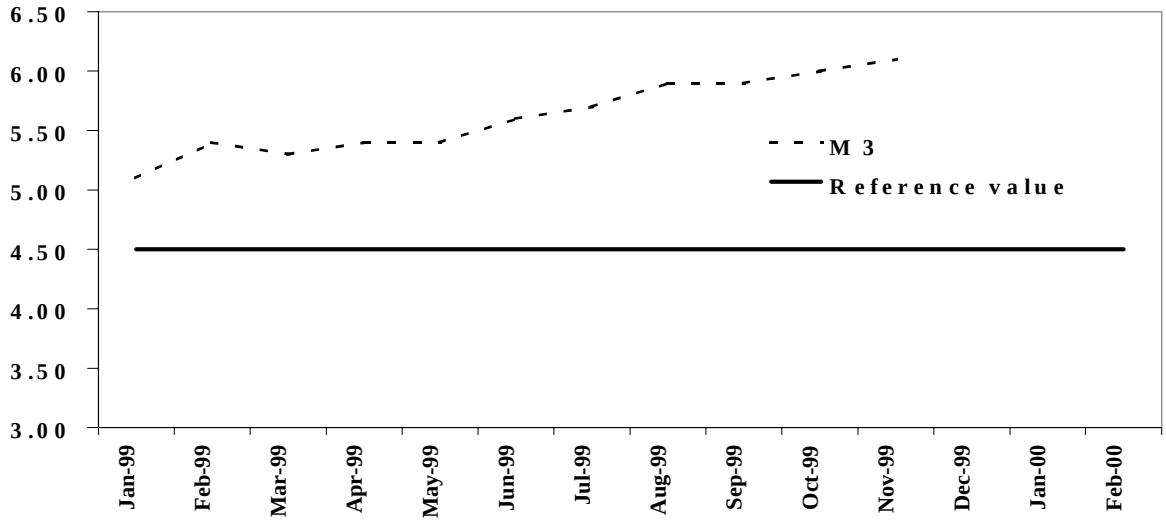


Chart 2: M3: reference value and actual growth



This raises the question whether the "targeting rule" could be regarded as an attractive alternative. Svensson describes the concrete procedure for a "targeting rule" described as follows:

> "The staff at the central bank can generate a collection of feasible inflation and output gap paths for different instrument paths for the MPC (monetary policy council of a central bank; P.B.) (or the Board). In this way, the staff shows the set of feasible conditional forecasts (...) to the MPC. The MPC then selects the conditional forecasts of inflation and the output gap that "look best", that is, that return inflation to the inflation target and the output gap to zero at an appropriate rate. If this selection is done in a systematical and rational way, it is approximately equivalent to minimising a loss function (...) over the set of feasible conditional forecasts. The corresponding instrument path then constitutes the basis for the current instrument setting." (Svensson 1998, p. 17).

Given the uncertainties about the "true model" and the policy lags in the short-run the Svensson rule is nothing else but a somewhat technical description of "discretion". [11]It cannot be regarded as relatively reliable and simple compass for the internal decisions of a central bank. For this reason it can also not be used as a "commitment technology" which allows the public to control monetary policy decisions in an easy way.

It is very likely that "definitive and simple rules" are an illusion or at least that such rules can mainly be regarded as "rules of thumb". But it is rather obvious that Svensson's "rule" is a simple misnomer. The advice to minimise a loss function on the basis of available models is nothing else but another word for "discretion".

Thus, a "targeting rule" in the sense of committing the ECB to minimise a certain loss function would make little sense. A public announcement of a such a procedure would create the expectation of a short-term controllability of the economic process which the ECB could not fulfil. Monetary policy is still more complex than "just an algorithm to solve an intertemporal

[11] This is confirmed by a description of the Bank of England's approach in Haldane (1997, p. 21): "The general point here is that the Bank's published inflation projection is not a mechanical extrapolation from a single macro model. Rather, it draws upon much wider and richer set of information variables – quantitative and qualitative, real and monetary. Indeed, increasingly, the Bank's published projection is also drawing on a wider set of models, as well as information variables.

optimisation problem (...)“ (Svensson 2000, p. 3). In fact, although he has repeatedly discussed the ECB’s strategy, Svensson he has so far refrained from presenting concrete interest rate paths that would minimise the ECB’s loss function.

Nevertheless, with its “broadly based assessment of the outlook of price developments” the ECB has made clear that it will not rely exclusively on an instrument rule or an intermediate targeting rule. Thus, in this respect its approach is in line with Svensson’s critique of such rules. The ECB’s approach is also confirmed by Bernanke et al. (1999, p. 22) who “believe that it is wrong to think of inflation targeting as a policy rule”:

> “First, a technical level, inflation targeting does not provide simple, mechanical operating instructions to the central bank. Rather inflation targeting requires the central bank to use structural and judgmental models of the economy, in conjunction of whatever information it deems relevant, to pursue its price-stability objective. In other words, inflation targeting is very much a ‘look at everything’ strategy, albeit one with a focused goal.” (Bernanke et al 1999, p. 22).

3.4 Inflation targeting a form of “constrained discretion”?

While Bernanke et al. do not regard inflation targeting as a rule “in the classical sense” they still regard it as a “framework for policy within which ‘constrained discretion’ can be exercised” (Bernanke et al. 1999, p. 22). This raises the question by which elements of inflation targeting this effect is achieved. The explanations provided by Bernanke et al. mainly refer to countries where the government can determine a central banks final targets. In this context a public announcement by the government to pursue a certain inflation target can indeed be regarded as an important commitment technology. Although the ECB is politically completely independent, it has also announced a numerical target band which would come very close to such a form of “constrained discretion”.

With a published inflation target the main constraint on a central bank’s discretion is exercised by the *outside inflation forecasts*. They allow an objective, permanent and timely evaluation of a central bank’s policy measures. If the outside forecasts diverge substantially from the target, a central bank gets under a strong pressure to justify this evaluation and eventually to adjust its interest rates. This constraint on a central bank’s discretion is especially powerful, if a central bank (like the ECB) is obliged to report regularly to the parliament.

As far as the other elements of inflation targeting are concerned the paper shows that a publication of an inflation forecast is not a useful commitment technology for a central bank. Them same applies to the concept of a “targeting rule”.

4. Effects of inflation targeting

In the view of Svensson (2000, p. 1) inflation targeting can be regarded as an “apparent success”. Bernanke et al. (1999) come to the result:

> “Inflation targeting has had important benefits for the countries that have used it. Inflation-targeting countries have achieved lower inflation rates and lower expectations; they experience less ‘pass-through’ into the inflation rate of shocks to the price level; and they typically enjoy lower nominal interest rates as a result of lower inflation expectations.” (Bernanke et al. 1999, p. 6)

But upon closer scrutiny the benefits of inflation targeting are much less clear-cut. Even in Bernanke et al. (1999) a rather sceptical assessment can be found:

> "Overall, though, we must admit that the economic performance of the non-targeters over the period considered is not appreciably different from that of inflation targeters." (Bernanke et al. 1999, p.283)

Lane and Van Den Heuvel (1998) and Jonsson (1999) come to rather similar results. He shows that inflation has become less volatile after the introduction of inflation targeting, but the same effect can be observed in many other industrial countries. Neumann (2000) compares actual inflation rates with inflation targets. He shows that the United Kingdom and Germany were most successful in reaching their targets. The other inflation targeting countries had major divergences between their targets and final outcomes.

From a forward-looking perspective it is instructive to compare inflation targets and forecasts for this year and to look at long-term bond yields of inflation-targeting countries and other countries (Table 6).

Table 6: Inflation targets, forecast and bond yields

	Inflation target for the medium-term	**CPI Inflation forecast 2000**	**long-term interest rate (10 years)**	**Implicit inflation forecast (real interest rate = 3.5 %)**
Australia	2-3	3.5	7.2	3.7
Canada	1-3	2.4	6.6	3.1
New Zealand	0-3	2.2	7.6	4.1
Sweden	1-3	1.3	6.0	2.5
United Kingdom	2.5	2.3	5.9	2.4
Euro area	<2	1.7	5.6	2.1
USA		2.7	6.8	3.4
Switzerland		1.6	3.6	0.1
Denmark		2.5	5.9	2.4
Industrial Countries		2.1		

Source: Deutsche Bank Research (2000)

With the exception of Australia all inflation targeting countries seem to be able to reach their target in this year, but the same applies to the ECB. The long-term interest rates show a relatively bleak picture for the inflation targeters. As far as bond yields can be regarded as an indicator for long-term expectations, monetary policy in New Zealand and Australia has not been fully been able to convince the private sector of its commitment to price stability. The comparison of Canada and the United States is also no clear indication that inflation targeting has a substantial impact on expectations. As far as the United Kingdom is concerned, it still has a risk premium over the euro area and there can be found no apparent advantage over Denmark which targets the exchange rate.

All in all, we are confronted with the astonishing result that there is absolutely no convincing evidence for the success of inflation targeting if it is understood in the comprehensive way of Svensson.

Another serious problem for an assessment of inflation targeting is the fact that all inflation targeting countries have adopted this strategy after they had already regained low inflation rates. Thus, there is no evidence on the contribution of inflation targeting in a disinflation process. Because of the still rather short experience with inflation targeting we also don't know anything about its functioning in a period of a world-wide inflation surge.

5. Summary

The paper shows that a comprehensive assessment of inflation targeting requires a careful analysis of its specific elements.

The most promising feature is a *published numerical medium-term inflation target* (elements 1-3 of Table 1). In countries with "goal dependent" central banks it makes clear that the government is willing to support a stability-oriented monetary policy. For central banks with a final target prescribed in a non-operational way by law, a numerical inflation target provides a clear benchmark for the evaluation of monetary policy and thus enhances transparency.

As the example of the Bundesbank demonstrates, intensive communication with the public (element 4) is also a very important ingredient of a successful monetary policy. For an effective evaluation of monetary policy, intensive information on *outside inflation forecasts*, surveys on inflation expectations and implicit inflation forecasts is especially helpful. The importance of such data is supported by the expectations channel which emphasises that inflation expectations can be regarded as an intermediate target of monetary policy.

If such information is provided by a central bank, a *publication of its own inflation forecast* (element 6) does not necessarily increase the transparency of monetary policy. Above all, the conditional nature of such forecasts makes them difficult to communicate them to the public. In addition, if the public is not convinced of a central bank's competence or its commitment to price stability, it will not pay too much attention to its forecasts. A published central bank forecast could also lead to a self-fulfilling prophecy, especially if it signals an increase in the inflation rate.

While Svensson pretends that inflation targeting can be used already as a "*monetary rule*" (element 5), this seems at least premature. Svensson is correct that central banks cannot simply rely on "instrument rules" or a simple monetary rule but his "targeting rule" implies a fine-tuning of the economy in the short-run which is still difficult to reconcile with the huge uncertainties about the transmission process in the short-run. Thus, a commitment to such a rule would require frequent adjustments which could undermine the reputation of a central bank.

The empirical analysis supports the view that last two elements contribute very little to the transparency and credibility of monetary policy. The performance of the 5 explicit inflation targeters is by no means better than the performance of central banks that simply pursue a stability-oriented monetary policy (elements 1-4). Forward looking variables even indicate higher inflation expectations for some of the inflation targeters. This could be attributed to the fact that the governments in these countries still have a powerful role in setting the final targets of monetary policy. Thus, in contrast to the recommendation by Bernanke et al. it seems not advisable to increase the political influence in the monetary policies of the United States and the euro area. The opposite is required, the inflation targeting countries need a monetary constitution which defines price stability as the final target and which excludes all government interference in the conduct of monetary policy.

As far as the ECB is concerned, its strategy includes already the four most important elements of inflation targeting. However, the communication is flawed by the inadequate role that it assigns to its reference value for the money stock M3 (element 4).[12] In its practical monetary policy this "pillar" seems to be as irrelevant as the monetary targeting in the era of Bundesbank. The announcement of a numerical inflation target would not increase the transparency of its monetary policy. Instead, the monthly reports should pay even more attention to a comprehensive and explicit presentation of all available indicators that show the inflation expectations in the euro area and in its member countries.

At the end of this discussion of commitment technologies of monetary policy, I want to conclude with an important caveat that can be found in the study by Bernanke et al. (1999):

> "It appears that, for monetary policy-makers, announcements alone are not enough; the only way to gain credibility is to earn it." (Bernanke et al. 1999, p. 275)

[12] See Bofinger (1999).

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