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Targeting Monetary Aggregates and Inflation in Europe

by

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1.Introduction

The recent quest for price stability in conjunction with the relative success of the Bundesbank in maintaining low inflation induced a good number of countries in Europe and elswhere to reconsider the legal foundations of the institutions that formulate and implement monetary policy. The notion that Central Bank Independence (CBI) is an important institutional device for assuring price stability recently gathered remarkable momentum. Belgium, France, Italy, Portugal and Spain upgraded the legal independence of their central banks. In some other European countries like the UK and Sweden there is a serious debate about the best way to reorganize monetary institutions. In parallel there has been a renewed interest in the old idea of nominal targets. Several factors combined to spur this interest. First, the breakdown of the European Monetary System (EMS) and the Maastricht Treaty, that envisages the creation of a highly independent European Central Bank (ECB) before the end of the century, make the quest for a European monetary anchor more pressing. Second, as stressed by Goodhart and Vinals (1994), when they delegate authority to a relatively independent central bank (CB) politicians' desire to specify its objectives in advance is greater than if **they** retain authority over monetary policy. Third, the preannouncement of nominal targets usually has some effect on inflationary expectations, and through them on various nominal contracts, making it possible to partially capitalize the benefits of credible monetary policies early on.

Targets help galvanize and coordinate the anti-inflationary forces within the public sector and outside it around a specific numerical value thus strenghtening the commitment to price stability. This is achieved not only by commiting the CB but also by making it more difficult for political authorities to renege on the commitment to price stability because of the associated detrimental effects on **their** credibility. This point of view is consistent with empirical evidence showing that, other things the same, rates of inflation in countries that had nominal targets were

lower (Cukierman (1992),table 20.4)[1]. But the credibility of preannounced targets ultimately depends on their record. Policymakers earn the ability to substantially impact expectations merely by announcing targets only after they have demonstrated this ability for a sufficient lenght of time.

During the seventies and the eighties a number of countries such as the US, Germany, Switzerland and France have preannounced monetary targets ranging from narrower to wider definitions of money. In the early nineties, several countries like New-Zealand, Canada, the UK, Sweden and Finland introduced inflation targets. Exchange rate targets have been, and still are, widely used by many countries. Under exchange rate targets monetary expansion and interest rate policy are derived from the objective of maintaining the exchange rate at a fixed peg or within some prespecified band[2].

Altough each type of target alone suffices to provide nominal stability when it is adhered to, it is not uncommon to observe countries with multiple targets. Examples are the Bundesbank that has an explicit monetary target and an implicit inflation target (von Hagen (1995)). Since the early nineties Israel has both an inflation target as well as an exchange rate target (Bufman, Leiderman and Sokoler (1995)). The common aim of all these arrangements is to provide a 'nominal anchor" for monetary policy by subjugating it to the achievement of a preannounced target. In practice targets had often been missed but this does not mean that policymakers made no effort to achieve them or that they were useless. A list of industrial countries currently using each type of target appears in table 3 of

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[1]The inflation record of New-Zealand under the 1989 new CB law is also consistent with this view.

[2]A fixed peg can be viewed as a limiting case of exchange rate bands in which the width of the band tends to zero. A discussion of the choice of exchange rate bands within the context of the tradeoff between credibility and flexibility appears in Cukierman, Kiguel and Leiderman (1994).

Goodhart and Vinals (1994)[3].

There are substantial variations in the identity of the institution making the announcement of target and in its 'firmness' across countries. Exchange rate targets are usually decided upon and announced by government with or without the participation of the CB. The CB appears to be involved relatively more often in the case of inflation targets but their preannouncement is often made jointly with government. But even when government sets targets alone the CB is involved in their implementation. The relative involvment of the CB in both determining and announcing the target is greatest in the case of monetary targets but there are variations even across the countries that had or have monetary targets. The firmness of the announcement varies from a mere forecast, as is the case in Japan, to an explicit commitment to use policy in order to correct deviations from the announced course as is currently the case in New-Zealand. The decision about the numerical value of the target and the identity of the institution announcing it also varies substantially across countries. Thus, the highly independent Bundesbank decides and announces explicit **monetary targets** without any direct involvment of Government. On the other hand the, relatively dependent, Bank of England has recently been using **inflation targets** that are basically set by the Treasury and announced jointly by the Governor of the Bank and the Chancellor of the Exchequer. There also is a fair amount of variety within each type of targeting method. Exchange rate targets vary with respect to band width and with respect to the slope of the band. In practically all European countries that had or have an exchange rate target the band (or the peg) is horizontal. Israel and Chile are using

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[3]A discussion of the recent experience with inflation targets appears in Leiderman and Svensson (1995). GNP targeting is occasionally mentionned as a fourth possible targeting method, particularly in the US. But as far as I know it remains in the realm of academic discussions. One of the practical difficulties with this targeting method is that GNP cannot be targeted on a monthly (or finer) basis since data on it is usually quarterly and becomes available with a relatively long lag. On the other hand McCallum (1995a) argues that, given the current state of knowledge about the relative impact of money growth on prices and output it is more practical to target nominal GNP than inflation. This conclusion is based on simulations of alternative policy rules for the US and Japan.

diagonal bands. In the first country the slope of the band is preannounced for a year in advance. In the second it is adjusted each month as a function of domestic and of foreign inflation. Monetary targets may obviously focus on alternative nominal stocks ranging from the monetary base to wide monetary or credit aggregates. The status of inflation targets also varies across countries with regard to the target's legal and institutional support, the commitment to and priority of the target, how explicit the target is, and whether it is decided by the CB, the government or both. (Further details appear in Leiderman and Svensson (1995)).

Section 2 opens with a characterization of the features of a good target and discusses alternative targeting procedures in light of this benchmark. Section 3 goes into a more detailed comparison of inflation targets and of monetary targets. The identity of the announcing institution and the lenght of the targeting horizon are discued in section 4. Section 5 briefly reviews conventional wisdom and recent results concerning the difference between inflation targets and price level targets. Section 6 discusses several aspects of targetry in the presence of stabilization policy: targets as a substitute for an optimal CB contract, factors affecting the information content of inflation targets and the issue of whether there is or there is no credibility bonus in the presence of stabilization policy. The desirability and design of targets for the ECB are discussed in section 7. This is followed by concluding remarks.

2. What is a good Target?

A basic question underlying any normative discussion of targetry is what are the properties of a good target? The ideal target should probably be easy to control, highly visible (or transparent) to the public, highly correlated with the final objective, observable at short intervals and should not interfere with the achievement of other economic goals. In this paper I will take the main final objective of monetary policy to be the maintainance of price stability[4]. Provided there are

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[4]Price stability may be taken literally to mean that monetary policy is geared to maintain a constant average price level or to mean that it is aimed at maintaining a low rate of

sufficient exchange rate reserves or if monetary policy is subordinated to its achievement an exchange rate target satisfies the first condition. As stressed by Melitz (1988) and Bruno (1993) it is also highly visible and observable on a daily basis. In small open economies the exchange rate is also strongly correlated with the price level.

The main drawback of an exchange rate target is that it may lead, in some cases, to an overvaluation of the currency and to a consequent loss of competitiveness. This is particularly likely to be the case in small, relatively open economies, whose domestic financial assets are not perfect substitutes for financial assets that are denominated in foreign currency. In such economies it is possible to raise the money supply while maintaining a fixed peg, at least for a while, by means of sterilized interventions[5]. In those cases policymakers are tempted to use monetary expansion to achieve domestic objectives while relying on sterilized interventions to maintain their commitment to the peg. This combination of policies eventually leads to a nominal devaluation. But until this happens the real exchange rate may be overvalued. This problem is unlikely to affect countries like Germany and the UK whose monies are key currencies and whose financial assets are therefore highly substitutable. But it may lead to serious temptations to expand the money supply, in spite of the fixed peg, in countries like Greece and Italy whose monies are not key currencies and whose financial assets are therefore only imperfectly substitutable into financial assets that are denominated in other currencies. Part of this lack of substitutability is due to implicit, if not explicit, exchange controls.

Base targeting has the important advantage that it is, at least in principle, fully controllable by the CB. But it is less visible than either an exchange rate target or an inflation target. Hence its effect on inflationary expectations may be restricted to individuals who have sufficient familiarity with financial and monetary matters.

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inflation. The implications of this distinction are discussed in section 5 below.

[5]A precise description of the mechanics of this process appears in the theoretical part of Cukierman, Rodriguez and Webb (1996).

Controllability is likely to be smaller the wider the monetary stock that is being targeted. Even if it is not available on a daily basis data on the monetary base or on a wider monetary stock can be obtained, at least by the CB, with reasonably high frequency. Base, or more generally nominal stock, targeting does not create temptations to engage in non sustainable policies, as is the case with an exchange rate peg. But it may interfere with stabilization policy. The main problem with nominal stock targeting is that it is imperfectly correlated with the price level and inflation. This is the old Friedmanian problem of long and variable lags between money and prices. Due to financial innovations and the globalization of financial markets this problem has recently become particularly severe.

Being focussed on the main final objective of monetary policy inflation targets have an important visibility advantage over monetary targets since inflation and the price level are widely understood concepts. In most countries data on inflation is available at one month intervals which is likely to be sufficient as long as the rate of inflation is moderate. Since money is neutral in the long run an inflation target need not interfere with the achievement of other objectives in the long run. But, due to variable lags between money and prices as well as to shocks to the real economy, the CB does not have perfect control over inflation. Thus the choice between inflation and base, or wider nominal stock, targets involves a tradeoff between visibility and controllability. A discussion of the implications of this tadeoff appears in section 3 below.

2.1 Positive Aspects of Targets' Choice

I briefly turn now to positive aspects of the choice between alternative targeting procedures. In particular why do some countries use one target and other use a different one and why does the choice of target sometimes change over time?

Exchange rate pegs are usually used in small, relatively open economies. Such countries often peg to the currency of a major trading partner provided this currency is relatively stable. Austria, Belgium and the Netherlands that peg to the Mark are examples. Fixed pegs are also used during and following the stabilization of inflation when credibility is relatively low. But after a while there is a tendency to

flexibilize the exchange rate (Cukierman, Kiguel and Leiderman (1996)). Argentina, Mexico, Israel and Chile are examples. A possible theoretical explanation for why policymakers with low credibility prefer fixed pegs to inflation targets cum flexible rates is proposed by Herrendorf (1995). The argument is that since the exchange rate is more visible and more controllable than the rate of inflation, policymakers find it more costly to deviate from an exchange rate target than from an inflation rate target.. As a result the disciplinary effect of an exchange rate target is stronger making it easier for serious policymakers with little reputation to signal their commitment to price stability.

Countries that have opted for either monetary or inflation targets are usually not so open. They often have flexible exchange rates or at least relatively more flexible rates and are more likely to have relatively wide financial markets. The US, Japan, Germany, and the UK are examples. Further details can be found in Goodhart and Vinals (1994) and in Cukierman, Rodriguez and Webb (1996).

3. Inflation Versus Monetary Targets

Financial innovations and the consequent breakdown of traditional regularities between money and nominal income reduced the ability of monetary authorities to control inflation and with it the meaning of monetary targets for short run inflation control. This led to the recent adoption of inflation targets in Canada, New-Zealand, the UK, Sweden, Italy, Finland and Israel.

Despite success in attaining preannounced targets in New-Zealand, Canada and the UK, bond yields suggest that long term inflationary expectations persistently exceeded long term targets throughout the first years after the introduction of inflation targets (Ammer and Freeman (1994)). This does not necessarily imply that the preannouncement of targets had no impact on expectations. But it does imply that in the presence of imperfect reputation this impact is partial and that high reputation for price stability is established only after a persistent record of low inflation. This is consistent with theory which implies that in the presence of

imperfect reputation the impact of announcements on inflationary expectations is partial (Cukierman and Liviatan (1991) and chapter 16 of Cukierman (1992)).

As noted in the previous section the choice between inflation targets and monetary targets involves a tradeoff between visibility and controllability. This tradeoff is most notable when the monetary target is high powered money since this is a nominal stock that can be tightly controlled by the CB. What is the differential effect of those two targeting methods on expectations and on the expected value of policy objectives? Cukierman (1995a) provides a systematic analysis of these questions in a framework of private information about the dependability of policymaker. A dependable policymaker always tries to achieve preannounced targets whereas a non dependable policymaker always chooses the policy that maximizes the value of objectives after the public has commited itself to nominal wage and interest rate contracts. Under base targeting dependable policymakers can demonstrate their dependability relatively quickly. Since the base is perfectly controllable any deviation from the preannounced path is immediatly recognizable as due to lack of dependability. By contrast, since the controllability of inflation is imperfect it is more difficult for the public to quickly separate between dependable and non dependable policymakers.

Thus, a dependable central banker can establish his dependability relatively more quickly under base targeting than under inflation targeting provided the **same** number of individuals pay attention to both types of announcements. On the other hand, since inflation targets are more visible to the general public than base targets, less people pay attention to the latter target making the immediate impact of base announcements on the **average** inflationary expectation of the public smaller. The analysis reveals that inflation targets dominate base targets when reputation is high and policymakers are sufficiently patient.

Not surprisingly the relative advantage of base targets increases with their visibility, and under some conditions, the lower is the controllability of inflation. Altough these results are exploratory they back up the presumption that the recent higher uncertainty about the relation between money and prices increases the relative

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attractiveness of nominal stock targets.

Beyond that, inflation targets have the virtue of being focussed on the final objective of interest. This is particularly important when the relation between money and prices is relatively unstable. But inflation targets make it easier to exert expansionary pressures on the CB in order to (temporarily) reduce interest rates and achieve various real objectives. Such pressures are particularly likely to materialize in periods in which the inflation target is attained[6]. This problem is compounded by the fact that when there is a change in the rate of inflation neither the public, nor policymakers know with certainty whether the change is persistent or transitory. Data on the rate of inflation is usually monthly. When the monthly rate of inflation goes down there is an immediate tendency to proclaime victory over inflation and to release the monetary brakes in order to reduce interest rates and achieve related real objectives. But when the monthly rate of inflation goes up there is a tendency to wait and see whether the change is really persistent before applying the monetary brakes. This asymmetric response of policy compounds the inflationary bias of monetary policy. In the absence of the persistent-transitory confusion the bias is likely to be smaller since, with full certainty about the persistence of shocks, it is harder for advocates of expansionary monetary policy to press their case.

4. Who Should Announce Targets and for How Long?

4.1 Who Should Announce?

The credibility of announced targets depends among other things on the identity of the institution emmiting those announcements and on its position within the narrow circle of policymakers that make decisions about monetary policy. In general announcements by a representative of **all** the policymakers involved is likely to carry more weight than announcements by a subgroup. To the extent that only one institution announces targets it is preferable that the announcing institution be the one that has the highest degree of control over the target under consideration.

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[6]Further discussion of these issues appears in Cukierman (1995b).

Thus if there is a monetary target and the CB has full authority over monetary policy the CB should make the announcement. If the Treasury has authority over monetary policy the announcement should be made by the Treasury. When authority over the announced target is shared a joint announcement would appear to be particularly important. For example, if there is an exchange rate target in place and government as well as the CB can affect it, the announcement should be made jointly by both institutions.

4.2 What is the Optimal Targeting Horizon ?

When they make announcements and subsequently renege on them dependable policymakers normally incur costs[7]. The ideal targeting strategy for a dependable policymaker is, therefore, to announce a conditional targeting procedure that specifies all the contingencies under which the target will be abandonned. Unfortunately such a strategy is usually impractical for several reasons. First,due to Knightian uncertainty it is hard if not impossible to formulate all possible contingencies in advance. Even if that was possible it is likely that most of the public would not pay attention or would not comprehend a targeting procedure that required more than a certain minimal threshold level of complexity. Finally, some of the contingencies are revealed expost only to a select group of policymakers making the degree of adherence to the target unverifiable by most of the public even on an expost basis. It appears therefore that targeting procedures will have to remain simple implying that even a dependable policymaker will sometimes renege on the announced target.

The necessity to specify simple targets implies that in general there is a tradeoff between the flexibility needed to use monetary policy for stabilization purposes and the discipline needed to eliminate the (suboptimal) inflationary bias of monetary

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[7]The nature of those costs is discussed in Cukierman (1992) page 312.

policy[8]. One way to strike an optimal compromise between those two objectives is to commit to the attainment of the target **on average** over several periods. Garfinkel and Oh (1993) show that, in the presence of private information, the optimal targeting period is usually longer than one period but not infinite. They also identify some of the factors that determine the lenght of the optimal targeting period.

The idea of multiperiods targets has recently been applied in the context of inflation targets. Examples are Spain and New-Zealand. A potential problem with multiperiods inflation targets is that they increase the temptations of policymakers to rebase. In particular when actual inflation deviates upward from the target there is a temptation to 'forget' the deviation and to stick to the target only from the next period and on. Since there is no similar temptation when there is a downward deviation from the target this creates a positive 'inflation drift'. A similar 'base drift' occured in the US during the period of monetary targeting.

Uncertainty about the future usually increases with the lenght of the planning horizon. This implies that the likelihood that a dependable policymaker will have to renege on a simple targeting procedure increases with the lenght of the prespecified targeting period. One way to reduce the likelihood of reneging is to limit the lenght of the targeting period. The presence of substantial uncertainties tends, therefore, to reduce the optimal lenght of the period over which the announced target is in effect.

5. Price Level Versus Inflation Targets

An issue that got some recent attention is whether one should aim at a price **level** target or at an **inflation rate** target. Had inflation been perfectly controllable this two targeting methods would be equivalent provided the inflation target is set at zero. But since inflation and the price level are not perfectly controllable the target is usually missed. The difference between the two methods arises because the

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[8]An intuitive discussion of the reasons for such a bias can be found in chapter 2 of Cukierman (1992).

correction of 'misses' differs. In the first case a period of higher than normal inflation would have to be followed by a period of deflation. In the second case there is no need to undo past misses. Under an inflation target, if actual inflation in the last period is higher than the target, there is no attempt to compensate for that in the current period. Thus, with an inflation target uncertainty about the long run price level is larger but there is more certainty about the future rate of inflation than with a price level target.

In the presence of nominal rigidities higher inflation variability is associated with higher output variability. It follows that under a price level target there is less uncertainty about the price level but more uncertainty about output than under an inflation target (Duguay (1994), Fischer (1994)). Conventional wisdom implies therefore that the choice between this two targeting methods involves a tradeoff between price level uncertainty on one hand and output and inflation uncertainty on the other.

But Svensson (1995b) shows that when the loss function of policymakers is quadratic in unemployment and inflation the tradeoff arises only when the degree of persistence of unemployment is zero or sufficiently low. When, on the other hand, unemployment persistence is sufficiently high price level targets dominate inflation targets on all counts. In particular price level targets deliver lower inflation and output uncertainty, lower price level uncertainty, and also eliminate the inflationary bias of monetary policy. This result obtains provided it is possible to 'assign' by law or by some other device the 'appropriate' (quadratic) objective function to the CB. Thus, with sufficient persistence in unemployment, and assigned quadratic loss functions price level targeting is preferable to inflation targeting.

6. Inflation Targets and Stabilization Policy

6.1 Inflation Targets as an Optimal Contract for Central Bankers

It is well known that in the presence of employment or other real objectives on the part of monetary authorities discretionary policy leads to a suboptimal

inflationary bias. In an influential paper Rogoff (1985) noted that the bias can be reduced by appointing a 'conservative' central banker that cares more than society about price stability. Here the degree of conservativeness refers to the relative weight given to price stability in the objective function of the central banker. But, since he cares relatively less about employment, the conservative central banker also engages too little in stabilization policy relatively to what is optimal from a social point of view. There is, therefore, a tradeoff between reduction of the inflationary bias and stabilization policy--or in short-- a tradeoff between credibility and flexibility.

Walsh (1995) and Persson and Tabellini (1993) show that it is possible to devise an optimal incentive contract for central bankers that eliminates the bias without sacrificing the ability to stabilize output. This is achieved by imposing an appropriate incentive schedule on the CB. A nice feature of this type of incentive contract is that it achieves the social optimum independently of whether or not government and the bank share the same objective function and the same information[9]. The optimal contract is thus strongly reminiscent of recent implementations of inflation targeting methods in New-Zealand, Canada, and several other countries.

The optimal contract approach to the design of monetary institutions is a natural theoretical vehicle for the formalization of the wider idea of accountability. However, there are several issues that have to be addressed before such optimal contracts can be implemented in practice. The first and main difficulty is that, altough they perform a useful function as benchmarks, social planners do not exist in practice. Hence government has to be relied upon to impose the optimal incentive schedule on the CB expost. Is it realistic to assume that government can be relied upon to do that? I believe that in the abscence of additional safeguards the answer is no. Governments and legislatures are also subject to an inflationary bias

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[9]For the simple Barro Gordon (1983) framework the parameters of the optimal contract are not state contingent. But this is not likely to be the case in more realistic environments (Persson and Tabellini (1993), Walsh (1995b)).

and   usually to a greater extent than the CB.   The constant threats to Federal Reserve independence mounted by Senator Paul Sarbanes and Representative Henry Gonzales, among others, in order to press for lower interest rates   attest to that. Similar mechanisms operate in other countries as well.   McCallum (1995b) and Walsh (1995b) himself recognize that if government cannot commit to the optimal penalty schedule **before**   various types of nominal contracts are concluded the optimal CB contract will not be credible[10].   This   then   shifts   the   focus   to   the question of how to commit government to implement the contract expost.   This is largely an open question.   But it is likely that the presence of legislation which requires government to publicly explain its actions whenever it deviates from the expost implementation of the contract may at least partially commit government to the expost application of the contract.   A requirement of this type that requires government to go public when it overrides the CB appears in the recent Bank of New-Zealand legislation.   Another practical difficulty is that the design of an optimal contract requires   advance knowledge of the preferences of the central banker to be appointed.   This is hardly likely to be the case in practice as illustrated by the work of Havrilesky (1991).

One of the advantages of delegation of authority a la Rogoff is that it is not necessary to rely on the political principals for the implementation of the optimal contract expost.   But,as we saw, Rogoff's proposal has the drawback that it does not achieve the optimal level of welfare[11].

Svensson (1995a) has recently shown (for quadratic loss functions and transitory real shocks) that when the objective function of the central banker differs from that of society with respect to desired inflation (rather than with respect to the relative,

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[10]Even the experts responsible for the Roll Report (1993) in the UK came down in favor of having the CB set its own targets, largely on the ground of the potential time inconsistency of politicians (Goodhart and Vinals (1994)). See also Cukierman (1994b) p.1444.

[11]Here the optimal level is defined as the level of welfare achieved by a benevolent social planner with full commitment ability.

multiplicative, preference for price stability as in Rogoff) delegation of authority to a central banker with the 'right' desired inflation target achieves the same result as the optimal contract.   This implies that the socially optimal level of welfare can be achieved through delegation of authority to a central banker with a suitable desired level of inflation rather than via an incentive contract for the bank.   The big advantage of the first institution is that it does not have to rely on the expost implementation of the optimal contract by inflation bias ridden governments.   It would appear, therefore, that Svensson's result implies that it is possible to reach the social optimum simply by delegating authority to an appropriately chosen type of central banker.   A practical difficulty, that may prevent the implementation of such an institution, is that the political principals may not be able to identify exante the desired levels of inflation of potential candidates for the CB.   Svensson suggests that this problem may be circumvented by giving the Bank only instrument independence, but not goal independence, so that the target or 'desired' rate of inflation in the Bank's loss function is mandated by government.   But under such circumstances government may, again, be tempted not to impose this institutional goal on the Bank expost.

6.2   The Information Content of Inflation Targets in the Presence of Stabilization Policy

Under imperfect control the preannouncement of targets almost always reduces the public's uncertainty about inflation (Cukierman and Meltzer (1986b) or Chapter 14 of Cukierman (1992)).   But when the CB has the discretion to engage in stabilization policy, the information content of inflation targets differs depending on the parameters of the economy and of the objective function of policymakers.   In particular, other things the same, the information content of unbiased announcements is higher the larger is the discount factor of policymakers.   The intuitive reason is that more patient policymakers are less activists.   As a consequence monetary policy responds less to shocks, making it easier for the CB to forecast future money growth and inflation.   Hence inflation announcements are more meaningfull and have a stronger impact on expectations when policymakers are more patient.   This point is

demonstrated in the appendix within the framework of a variant of the model in Cukierman and Meltzer (1986b). An important practical implication of this result is that monetary institutions that are more conducive to a long run policy outlook-- like longer terms for high officials of the CB--also raise the information content and therefore the credibility of inflation announcements[12].

6.3 Is There a Credibility Bonus?

It is sometimes claimed that when relatively credible central banks engage in stabilization policy they loose less credibility than banks that possess a lower level of reputation. Thus, goes the argument, a highly credible CB like the Bundesbank can deviate for a while from the objective of low inflation with little effect on its reputation as an inflation fighter. But if the Banca d'Italia decides to play the same game, the negative impact on its reputation is larger. This point of view implies that good reputation not only reduces the inflationary bias but also makes it easier to engage in stabilization policy. Altough this argument seems plausible, and may very well be true under some circumstances, the little available empirical evidence does not support it[13]. As far as I know there is also no precise formulation of the conditions under which it might be true. It is therefore best viewed, at this stage, as an intriguing possibility. My conjecture is that when the matter is investigated more toroughly it will turn out that a crucial element in this argument is the speed of learning by the public. When monetary institutions are conducive to a slow speed of learning credibility is destroyed (and built up) slowly. When, on the other hand, they are conducive to a fast speed of learning credibility is more sensitive to recent events and can be destroyed (but also rebuilt) more quickly. The work of Cukierman and Meltzer (1986a) implies that in the absence of announced targets the speed of learning depends on several parameters like the slope of the short run

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[12]See also section 4 in Cukierman (1994a).

[13]Empirical evidence on the relation between CBI and fluctuations in output appears in Alesina and Summers (1993) and in Cukierman et. al. (1993). Debelle and Fischer (1994) compare the sacrifice ratio in the US and Germany and find that it is higher in the second country. See also Alesina and Gatti (1995).

Phillips curve, the political discount factor of policymakers, the variability in the relative emphasis of policy on alternative objectives and the degree of control over the money supply and inflation (a compact and precise statement of the directions of influence appears as proposition 10.1 in Cukierman (1992)).

In the presence of announced targets, like in the model in the appendix, it is also possible to identify determinants of the credibility of **inflation targets**. Two different concepts of credibility suggest themselves--average credibility and marginal credibility of announced inflation targets. The first concept is a measure of the average difference between the announcement and the public's expectations after being exposed to the announcement. The second concept focusses on the impact of a one unit change in the announced target on expectations. It is thus a measure of the impact of targets on expectations. A fuller discussion appears in Cukierman and Meltzer (1986b) and in chapter 14 of Cukierman (1992) (proposition 14.4 is particularly relevant in this context)[14].

7. What Target for the ECB?

Altough it contains a substantial number of provisions concerning the ECB, the Treaty of Maastricht does not mention targets for the Bank. The issue of targetry for the ECB is therefore open from both a legal as well as from a practical point of view. This raises two questions. Should the ECB announce targets ? If the answer to the first question is positive what kind of targets should be used by the Bank ? I believe the answer to the first question is affirmative for two reasons. First, provided the institutional and other devices that enhance the credibility of the Bank as an inflation fighter are in place, the announcement of targets makes it possible to

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[14]As emphasized in chapter 11 of Cukierman (1992) credibility is a concept with many meanings and interpretations. Along those lines it should be emphasized that the two concepts of credibility in the text differ from the popular notion that labels a CB as being credible if it is conservative in Rogoff's sense.

reduce inflationary expectations early on[15]. Second, targets help coordinate and galvanize the anti inflationary forces within the public sector. The associated publicity makes it relatively difficult for expansionary politicians to ignore the targets thus reducing actual inflation as well.

As to the second question it appears that for a big block of countries like the EEC pegging the exchange rate to another key currency is undesirable as well as politically impractical. By elimination this leaves either monetary targets or inflation targets as possible candidates. As explained in section 3 the first type of target is more controllable but the second one is more visible. Other things the same, the higher visibility of inflation targets makes the political cost of reneging on them higher than the cost of reneging on monetary targets. Hence the range of contingencies for wich inflation targets are respected is wider than the range of contingencies for which monetary targets are respected. Financial innovations and related changes in the relationship between money and prices also make inflation targets preferable. But, relatively to monetary targets, inflation targets make it easier to exert expansionary pressures on the Bank in order to reduce interest rates and to achieve various real objectives.

It would appear therefore that a two prongs approach that combines the advantages of both inflation and of monetary targets is advisable[16] Such a combination target requires the specification of rules for situations in which the two targets conflict. Along those lines one way to reduce the relatively stronger bias of inflation targets is to adhere to monetary targets when actual inflation is below or at the target value and to set policy so as to achieve the inflation target when actual inflation is above target.

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[15]A detailed discussion of conditions that are conducive to a credible ECB appears in Cukierman (1995b).

[16] Lamfalussy (this volume) argues that, within Europe, the practical difference between countries currently using inflation targets and those using monetary targets is not as fundamental as would appear to be the case at first blush. If this view is correct a combination of the two targets should be relatively easy to "sell" to a majority of countries in the monetary union.

Unlike most existing central banks the ECB will face several fiscal authorities. Under such circumstances the incentive to inflate rises with the number of countries in the union if the Bank is not shielded from pressures to, directly or indirectly, finance national deficits. Being aware of those dangers the drafters of the Maastricht Treaty endowed the Bank with a high degree of legal independence and prespecified the distribution of seignorage across countries. Given the existence of those safeguards, the strong emphasis of the Treaty on price stability and the fractionalized interests of the national fiscal authorities, the ECB should have a substantial impact on the determination and announcement of targets. In other words, as far as the numerical value of targets is concerned, the Bank should have **partial goal** independence as well as **instrument** independence[17]. In addition, endorsement of these targets by the national fiscal authorities is desirable since it would enhance their credibility.

7.1 What targets for the transition period?

As emphasized by Leiderman and Svensson (1995) the initial phase of monetary union is likely to be characterized by substantial uncertainties. As a consequence, during the transition to monetary union, the credibility of the ECB is likely to be rather vulnerable. It is therefore advisable to deploy additional temporary credibility enhancing devices during the initial phase of EMU. In view of this a possibility that ought to be given serious consideration is a **temporary** peg of the new European currency to another stable key currency or currencies. An important advantage of a peg is that it reduces price level uncertainty in the face of large uncertainties about money demand.

Another option to consider for the transition period is to **temporarily** assign the conduct of European monetary affairs immediately after the formation of the monetary union to the Bundesbank. Such a strategy would, obviously, have to be accompanied by the specification of a time table and of concrete steps for the extension of authority over monetary policy, after some initial phase of

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[17]This distinction is due to Debelle and Fischer (1994).

experimentation, to other members of the union. The advantage of such an arrangement is that it reduces uncertainties at the time they are likely to be the largest - that is at the Union's inception. It's main drawback may be lack of political feasibility due to national pride and the fear that such an arrangement may evolve into a **permanent** hegemony of Germany over European monetary policy..

8. Concluding Remarks

Experience, empirical evidence and theoretical considerations all support the view that targets perform useful functions. They reduce inflationary expectations and the associated upward drift in nominal contracts. They also may reduce actual inflation by making it more difficult to ignore long term price stability in order to achieve short run real gains.

But, in the long run, targets are only as good as the general commitment of policymakers to price stability. This commitment and the informativeness of targets depend in turn on more fundamental parameters like the rate of time preference of policymakers as has been illustrated in section 6.2 and in the appendix. But the point is more general. The beneficial impact of targets ultimately depends on the emphasis given to price stability. This depends, in turn, on the structure of the economy, the structure of monetary institutions, the political system and on the interaction among those factors[18].

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[18]International evidence on the effect of gross political influence on price stability appears in Cukierman and Webb (1995).

Appendix

A1 The Information Content of Unbiased Inflation Announcements or Forecasts

Consider a policymaker whose objective is to maximize the expected value of

$$-\sum_{i=0}^{\infty} \beta^i \left[x_i(N^* - N_i) + \frac{\pi_i^2}{2} \right], \quad 0 \leq \beta \leq 1 \quad \text{(A-1)}$$

subject to a short run Phillips relation

$$N - N_n = \alpha\ (\pi - \pi^e), \quad \alpha > 0 \quad \text{(A-2)}$$

Here N, N* and N_n are the actual, the desired and the natural levels of employment. π and π^e are the actual and the expected rates of inflation and β is a politically determined discount factor. x_i can be thought of as a shifting parameter that characterizes the importance attached by policymakers to employment objectives and therefore to stabilization policy. A large x means that the desire of policymakers to engage in stabilization policy is stronger. A large x may reflect the policymaker's private forecast that employment will be on the low side making him more eager to stimulate employment. The objective function has the form in (A-1) only for $N^* - N_i > 0$[19]. x is a persistent stochastic variable whose distribution is given by

$$x_i = A + p_i \qquad A > 0$$

$$p_i = \rho p_{i-1} + v_i \qquad 0 < \rho < 1 \quad \text{(A-3)}$$

$$v_i \sim N(0, \sigma_v^2)$$

A is the mean, publicly known, value of x . p is the stochastic part of x and is the

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[19]For $N^* - N_i < 0$ the loss due to the deviation of actual from desired employment is zero. Part 1 of the appendix to chapter 9 of the appendix to Cukierman (1992) presents conditions under which the probability that $N^* < N_i$ tends to zero.

private information of policymakers. The persistence of real shocks and therefore of the desire to engage in stabilization policy is captured by specifying p as a first order Markoff process. The innovation, v, is normally distributed. The relation between the rate of growth of the relevant nominal stock and inflation is stochastic and is given by

where χ_i is a (normally distributed) white noise process with zero mean and

$$\pi_i = m_i + \psi_i \quad (A\text{-}4)$$

variance σ_ψ^2 that characterizes the extent to which inflation is uncontrollable by policymakers. ψ may be due to shocks to monetary velocity or to other unforseen one time shocks to the price level. v and ψ are statistically independent.

Policymakers have perfect control over the relevant (for inflation) nominal stock and also know what this stock is, while the public does not know what it is. This assumption captures in a simple way the realistic presumption that the CB has better information about what is the nominal stock that is most relevant for the price level than the public[20].

Consider now inflation targets. Legislation or some other commitment device assure that in each period the policymaker--perhaps the CB-- makes an unbiased (given his information) inflation announcement for the period. Expectations are rational in the sense that the public utilizes all the information it has, including the inflation announcement, to produce an optimal forecast of the upcoming inflation and concludes nominal contracts on this basis. In each period the timing of events is as follows. First the value of p from the previous period is revealed to the CB. Using this information the CB produces an **unbiased** inflation forecast for the period and announces it as the inflation target (π^a) for the period. The public takes notice of the annouced target, forms its inflation expectation and concludes nominal contracts accordingly. The current innovation, v_i, to the policymaker's objectives realizes next and is revealed to him before he picks the rate of monetary growth for

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[20]For a fuller discussion of this issue see page 111 in Cukierman and Sokoler (1993).

the period[21]. Finally the uncontrollable shock to inflation, ψ_i, realizes and together with the choice of money growth determines the actual rate of inflation.

With this timing, the CB can engage in meaningfull stabilization policy since v realizes **after** the conclusion of nominal contracts. Furthermore, in spite of the fact that the CB makes a *bona fida* effort to produce an unbiased inflation forecast, taking future stabilization efforts into consideration, the announced inflation target is a noisy indicator of subsequent inflation. This reflects the CB uncertainty about the upcoming innovation to its own objectives as well as about the shock, ψ_i, to inflation. Except for the fact that, when it makes the announcement, the CB is still uncertain about the **current** value of objectives this framework is identical to the framework in Cukierman and Meltzer (1986b) or in chapter 14 of Cukierman (1992). The best forecast, by the CB, of upcoming inflation at announcement stage is the expected value of π_i conditional on p_{i-1}. This expectation is given by

$$B_0 A \; + \; B \rho p_{i-1} \quad \text{(A-4)}$$

where

$$B_0 \; = \; \frac{(1-\beta\rho)(1+\sigma_\psi^2/\sigma_\gamma^2)\delta}{(1-\beta\delta)(\delta+\rho\,\sigma_\psi^2/\sigma_\gamma^2)} \quad \text{(A-5a)}$$

and

$$B \; = \; \frac{(1-\beta\rho^2)(1+\sigma_\psi^2/\sigma_\gamma^2)\delta}{(1-\beta\rho\delta)(\delta+\rho\,\sigma_\psi^2/\sigma_\gamma^2)} \quad \text{(A-5b)}$$

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[21]Note that knowledge of the current innovation to objectives is equivalent to knowledge of the current state of objectives since the previous state of objectives is already known to policymakers from the beginning of the period.

$$\sigma_\gamma^2 = B^2 \sigma_\nu^2 + \sigma_\psi^2. \quad \text{(A-6)}$$

This model maps into the one in chapter 14 of Cukierman (1992) with σ_γ^2 from that model replaced by the right hand side of equation (A-6) and with δ given by equation (14.6b) of that chapter. Note that B characterizes the degree of policy activism since it measures the response of money growth to the changing stochastic part of objectives[22]. Using figure 14.1 in the chapter to perform a comparative static experiment with respect to the discount factor, β, it can be shown that B is a decreasing function of β implying that activism is lower when policymakers are more patient.

Equation (A5) above implies that when the activism parameter B is higher announced inflation targets are noisier indicators of future inflation (σ_γ^2 is higher). In conjunction with proposition 14.1 in Cukierman (1992) this implies that preannounced inflation targets are more informative when policymakers are more patient.

References

Alesina A. and L. Summers (1993), "Central Bank Independence and Macroeconomic Performance:Some Comparative Evidence", **Journal of Money Credit and Banking,** 25, 151-162.

Alesina A. and Gatti R. (1995), "How Independent Should the Central Bank Be ?" , **American Economic Review,** 85, 196-200, May.

Ammer J. and T. Freeman (1994), "Inflation Targeting in the 1990s: The Experiences of New-Zealand, Canada and the United Kingdom", International Finance D.P. No. 473, Board of Governors of the Federal Reserve System.

Barro R.J. and D. Gordon (1983), "A Positive Theory of Monetary Policy in a Natural Rate Model", **Journal of Political Economy,** 91, 589-610.

Bruno M. (1993), **Crisis, Stabilization and Economic Reform: Therapy by Consensus**, Oxford University Press, Oxford.

Bufman G. , L. Leiderman and M. Sokoler (1995), "Israel's Experience with Explicit Inflation Targets: A First Assessment" in Leiderman L. and L. Svensson (eds.) (1995), **Inflation Targets**, CEPR, London.

Cukierman A. (1992), **Central Bank Strategy,Credibility and Independence:Theory and Evidence**, The MIT Press, Cambridge, MA.

Cukierman A. (1994a), "Commitment Through Delegation, Political Influence and Central Bank Independence", in J.O. de Beaufort Wijnholds, S.C.W. Eijffinger and L.H.

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[22]For details see equation (14.10) in Cukierman (1992).

Hoogduin (eds.), **A Framework for Monetary Stability**, Financial and Monetary Studies, Kluwer Academic Publishers, Dordrecht, Boston,Lancaster.

Cukierman A. (1994b), "Central Bank Independence and Monetary Control", **The Economic Journal**, 104, November, 1437-1448.

Cukierman A. (1995a), "Towards a Systematic Comparison between Inflation Targets and Monetary Targets", in L. Leiderman and L. Svensson (eds.), **Inflation Targets** ,CEPR, London.

Cukierman A. (1995b), "How Can the European Central Bank Become Credible?", Paper presented at a CEPR conference on: **What Monetary Policy for the European Central Bank?**, Frankfurt, Germany, June.

Cukierman A. and A. H. Meltzer (1986a), "A Theory of Ambiguity, Credibility and Inflation Under Discretion and Asymmetric Information", **Econometrica**, 54, 1099-1128, September.

Cukierman A. and A.H. Meltzer (1986b),"The Credibility of Monetary Announcements" , in M.J.M. Neumann (ed.) **Monetary Policy and Uncertainty**, Nomos-Verlagsgesellschaft, Baden-Baden, 39-68.

Cukierman A. and N. Liviatan (1991), "Optimal Accomodation by Strong Policymakers Under Incomplete Information", **Journal of Monetary Economics**, 27, 99-127.

Cukierman A. and M. Sokoler (1993), "Monetary Policy and Institutions in Israel, Past, Present and Future", **Bank of Israel Economic Review**, No. 65, 67-123, March.

Cukierman A., Kalaitzidakis P., Summers L.H. and Webb S.B. (1993), "Central Bank Independence, Growth, Investment and Real Rates", **Carnegie-Rochester Conference Series on Public Policy**, 39, Autumn, 95-145.

Cukierman A. , M. Kiguel and L. Leiderman (1994) "Choosing the Width of Exchange Rate Bands- Credibility versus Flexibility", CEPR DP No. 907, January.

Cukierman A. and S. Webb (1995) "Political Influence on the Central Bank-International Evidence", **The World Bank Economic Review**, 9, 397-423, September.

Cukierman A., M. Kiguel and L. Leiderman (1996) "Transparency and the Evolution of Exchange Rate Flexibility in the Aftermath of Disinflation", in Z. Eckstein, Z. Hercowitz and L. Leiderman (eds.), **Financial Factors in Stabilization and Growth**, Cambridge University Press, Cambridge, UK and NY, Forthcoming.

Cukierman A.P. Rodriguez and S.B. Webb (1996), "Central Bank Autonomy and Exchange Rate Regimes-Their Effects on Monetary Accomodation and Activism", in S. Eijffinger and H. Huizinga (eds.) **Positive Political Economy-Theory and Evidence**, Cambridge University Press, Cambridge, UK and NY, Forthcoming.

Debelle G. and S. Fischer (1994), "How Independent Should a Central Bank Be?", in J. C. Fuhrer (ed.), **Goals, Guidelines and Constraints Facing Monetary Policymakers**, Federal Reserve Bank of Boston.

Duguay P. (1994), "Some Toughts on Price Stability Versus Zero Inflation", Working Paper, Bank of Canada, Presented at the conference on **Central Bank Independence and Accountability**, Universita Bocconi, Milan, March 1994.

Fischer S. (1995), "Modern Central Banking" in F. Capie, C. Goodhart, S. Fischer and N. Schnadt (eds.), **The Future of Central Banking**, Cambridge University Press, Cambridge, UK.

Garfinkel M. and S. Oh (1993), "Strategic Discipline in Monetary Policy with Private Information: Optimal Targeting Horizons", **American Economic Review**, 83, 99-117, March.

Goodhart C. and J. Vinals (1994), "Strategy and Tactics of Monetary Policy: Examples from

Europe and the Antipodes", DP No. 9425, Bank of Spain.

von Hagen J. (1995), "Inflation and Monetary Targeting in Germany", in Leiderman L. and L. Svensson (eds.) (1995), **Inflation Targets**, CEPR, London.

Havrilesky T. M. (1991), "Screening FOMC Members for their Biases and Dependability", **Economics and Politics**, 3, 139-149.

Herrendorf B. (1995), "Transparency, Reputation, and Credibility Under Floating and Pegged Exchange Rates", Manuscript, European University Institute, August.

Lamfalussy A. (this volume), address to the conference on **Future European Monetary Policy**, Frankfurt, Germany, November,30 and december,1 1995.

Leiderman L. and L. Svensson (eds.) (1995), **Inflation Targets**, CEPR, London.

McCallum B. (1995a) , "Rules for Monetary Policy", **NBER Reporter**, Research Summaries, Spring 1995, 5-8.

McCallum B. (1995b) ,"Two Fallacies Concerning Central Bank Independence", **American Economic Review Papers and Proceedings**, 85, 207-211, May.

Melitz J. (1988), "Monetary Discipline, Germany and the European Monetary System: a Synthesis", in F. Giavazzi, S. Micossi and M. Miller, (eds.), **The European Monetary System**, Cambridge University Press, Cambrige, UK.

Persson T. and G. Tabellini (1993), "Designing Institutions for Monetary Stability", **Carnegie-Rochester Conference Series on Public Policy**, 39, Autumn, 53-84.

Rogoff K. (1985), "The Optimal Degree of Commitment to a Monetary Target", **Quarterly Journal of Economics**, 100, 1169-1190.

Roll Report (1993), A report of an independent panel chaired by Eric Roll, "Independent and Accountable:A New Mandate for the Bank of England", CEPR, London.

Svensson L. (1995a), "Optimal Inflation Targets, 'Conservative' Central Banks and Linear Inflation Contracts", Manuscript, Institute for International Economic Studies, Stockholm University, August.

Svensson L. (1995b), "Price Level Targeting Versus Inflation Targeting: a Free Lunch ?", Manuscript, Institute for International Economic Studies, Stockholm University, September.

Walsh C. (1995a), "Optimal Contracts for Independent Central Bankers", **American Economic Review**, 85, March, 150-167.

Walsh C. (1995b), "Is New-Zealand's Reserve Bank Act of 1989 an Optimal Central Bank Contract?", **Journal of Money, Credit and Banking**, Forthcoming.