Part III. German Monetary Targeting: A Precursor to Inflation Targeting

Many features of the German monetary targeting regime are also key elements of inflation targeting in the other countries examined in this study. Indeed, as pointed out in Bernanke and Mishkin (1997), Germany might best be thought of as a "hybrid" inflation targeter, in that it has more in common with inflation targeting than with a rigid application of a monetary targeting rule. The German experience with monetary targeting, which spans more than twenty years, provides useful lessons for the successful operation of inflation targeting, and this is why we study the German experience here.

Several themes emerge from our review of Germany's experience with monetary targeting:[1]

- A numerical inflation goal is a key element in German monetary targeting, suggesting that the differences between monetary targeting as actually practiced by Germany and inflation targeting as conducted by other countries are not that great.
- German monetary targeting is quite flexible: convergence of the medium-term inflation goal to the long-term goal has often been quite gradual.
- Under the monetary targeting regime, monetary policy has been somewhat responsive in the short run to real output growth as well as to other considerations such as the exchange rate.
- The long-term goal of price stability has been defined as a measured inflation rate greater than zero.
- A key element of the targeting regime is a strong commitment to transparency and to communication of monetary policy strategy to the general public.

The Adoption of Monetary Targeting

The decision to adopt monetary targeting in Germany, though prompted by the breakdown of the Bretton Woods fixed exchange rate regime, was a matter of choice. Germany was not under any pressure at the time to reform either its economy in general or its monetary regime in particular—in fact, the breakdown of Bretton Woods was in part due to the extreme relative credibility of the German central bank's commitment to price stability and the concomitant appreciation of the deutsche mark. Under these circumstances, the loss of the exchange rate anchor was not the sort of credibility crisis where macroeconomic effects demanded an immediate response, as demonstrated by the slow (two-to-three-year-long) move to the new regime.

Close analysis of the historical record suggests that two main factors motivated the adoption of monetary targeting in Germany. The first factor was an intellectual argument in favor of a nominal anchor for monetary policy grounded in an underlying belief that monetary policy should neither accommodate inflation nor pursue medium-term output goals.[2] The second factor was the perception that medium-term inflation expectations had to be locked in when monetary policy eased as inflation came down after the first oil shock. The generalization over time of this latter motivation—that monetary targeting provides a means of transparently and credibly communicating the relationship between current developments and medium-term goals—was the guiding principle of the newly adopted framework in Germany.

On December 5, 1974, the Central Bank Council of the Deutsche Bundesbank announced that "from the

present perspective it regards a growth of about 8% in the central bank money stock over the whole of 1975 as acceptable in the light of its stability goals."[3] The Bundesbank considered this target to "provide the requisite scope . . . for the desired growth of the real economy," while at the same time the target had been chosen "in such a way that no new inflationary strains are likely to arise as a result of monetary developments." Since 1973, the Bundesbank had used the central bank money stock (CBM) as its primary indicator of monetary developments, but never before had it announced a target for the growth of CBM or any other monetary aggregate.[4] Although this was a unilateral announcement on the part of the Bundesbank, the announcement stressed that "in formulating its target for the growth of the central bank money stock [the Bundesbank] found itself in full agreement with the federal government."

Although its statements at the time do not make the point explicitly, one of the Bundesbank's primary concerns appears to have been that public misperceptions might entrench high inflation expectations. At the beginning of 1975, the Bundesbank faced the task of continuing to ease monetary policy in view of the already apparent weakness in the economy, without giving the impression that its resolve to bring down inflation was diminishing. Recent experience had shown that wage-setting behavior in particular was mostly unaffected by the Bundesbank's efforts to reduce inflation:

> Wage costs have gone up steadily in the last few months, partly as after-effects of [earlier] settlements . . . which were excessive (not least because management and labor obviously underestimated the prospects of success of the stabilization policy). . . . Despite the low level of business activity and subdued inflation expectations, even in very recent wage negotiations two-figure rises have effectively been agreed. (Deutsche Bundesbank 1974b, December, p. 6)

The credibility issue arose, therefore, in the context of the Bundesbank's desire to stop the pass-through of a onetime shock to the price level; this concern for getting the public to distinguish between first-round and second-round effects of a price shock and to avoid locking in expectations of high inflation characterizes the efforts of the inflation targeters as well.

From this perspective, the German monetary target seems to have been adopted, at least in part, to create a necessary means of communication about inflation uncertainty. After CBM had grown by 6 percent during 1974, the Bundesbank announced a target growth rate of 8 percent for 1975:

> An acceleration of money growth was intended to stimulate demand and provide the monetary scope necessary for the desired real growth of the economy. On the other hand, the target was also intended to show that no precipitate action would be taken to ease monetary conditions, in order not to jeopardize further progress towards containing the inflationary tendencies. (Deutsche Bundesbank 1976a, p. 5)

It is worth noting, however, that this explanation and the statement cited in the previous paragraph were made *after* the targets were announced, not contemporaneously with the announcement.

The Operational Framework

Our historical and institutional analysis in this section and the following one (which discusses German monetary policy in the 1990s) independently confirms the impression of German monetary policymaking raised in Bernanke and Mishkin (1992) and argued by later econometric observers. That is, the Bundesbank does not behave according to a reduced-form-reaction function as though price stability were its sole short-to-medium-term policy goal, or as though the monetary growth–goal correlation were strong enough to justify strictly following the targets, ignoring wider information.[5] In fact, in the following discussion we bring out the operational reality and implications: that the monetary targets provide a framework for the central bank to convey its long-term commitment to price stability.

From 1975 until 1987, the Bundesbank announced targets for the growth of central bank money (CBM). CBM is defined as currency in circulation plus sight deposits, time deposits with maturity under four years, and savings deposits and savings bonds with maturity of less than four years (the latter three components are weighted by their respective required reserve ratios as of January 1974). CBM is different from the monetary base in that banks' excess

balances are excluded and the weights of deposits subject to reserve requirements are historical, not current, ratios.

Since 1988, the Bundesbank has used growth in M3 as its intermediate target. M3 is defined as the sum of currency in circulation, sight deposits, time deposits with maturity under four years, and savings deposits at three months' notice. Apart from not including savings deposits with longer maturities and savings bonds, the major difference between M3 and CBM is that the latter is a weighted-sum aggregate, while the former is a simple sum. By definition, therefore, CBM moves very closely with M3. Because the weights on the three types of deposits are fairly small,[6] the only source for large divergences between the growth of the two aggregates is significant fluctuation in the holdings of currency as compared with deposits. This potential divergence became critical in 1988, in the face of shifting financial incentives, and again in 1990-91, after German monetary unification.

The Bundesbank has always set its monetary targets at the end of a calendar year for the next year. It derives the monetary targets from a quantity equation, which states that the amount of nominal transactions in an economy within a given period of time is identically equal to the amount of the means of payment times the velocity at which the means of payment changes hands. In rate-of-change form, the quantity equation states that the sum of real output growth and the inflation rate is equal to the sum of money growth and the change in (the appropriately defined) velocity. The Bundesbank derives the target growth rate of the chosen monetary aggregate (CBM or M3) by estimating the growth of the long-run production potential over the coming year, adding the rate of price change it considers unavoidable (described below), and subtracting the estimated change in trend velocity over the year.

Two elements of this procedure deserve emphasis. First, the Bundesbank does not employ forecasts of real output growth over the coming year in its target derivation, but instead estimates the growth in production potential.[7] This "potential-oriented approach" is based on the Bundesbank's conviction that it should not engage in policies aimed at short-term stimulation. This approach allows the Bundesbank not only to claim that it is not making any choice about the business cycle when it sets policy, but also to de-emphasize any public discussion of its forecasting efforts for the real economy, further distancing monetary policy from the course of unemployment. The transparency of the quantity approach, therefore, gets certain items off the monetary policy agenda (or at least moves in that direction) by specifying the central bank's responsibilities.

The second noteworthy element of the Bundesbank's procedure for deriving the target growth rate of its chosen monetary aggregate relates to the concept of "unavoidable price increases," where prices are measured by the all-items consumer price index (CPI). These goals for inflation are set prior to the monetary target each year and specify the intended path for inflation, which in turn motivates monetary policy.

> In view of the unfavorable underlying situation, the Bundesbank felt obliged until 1984 to include an "unavoidable" rate of price rises in its calculation. By so doing, it took due account of the fact that price increases which have already entered into the decisions of economic agents cannot be eliminated immediately, but only step by step. On the other hand, this tolerated rise in prices was invariably below the current inflation rate, or the rate forecast for the year ahead. The Bundesbank thereby made it plain that, by adopting an unduly "gradualist" approach to fighting inflation, it did not wish to contribute to strengthening inflation expectations. Once price stability was virtually achieved at the end of 1984, the Bundesbank abandoned the concept of "unavoidable" price increases. Instead, it has since then included . . . a medium-term price assumption of 2%. (Deutsche Bundesbank 1995c, pp. 80-1)

The setting of the annual unavoidable price increase thus embodies four normative judgments by the Bundesbank. First, a medium-term goal for inflation motivates policy decisions. Second, convergence of the medium-term goal to the long-term goal should be gradual since the costs of moving to the long-run goal cannot be ignored. Third, the medium-term inflation goal has always been defined as a number greater than zero. Fourth, if inflation expectations remain contained, there is no need to reverse prior price-level rises.

The target for 1975 was a point target for CBM growth from December 1974 to December 1975. Since this target definition was susceptible to short-term fluctuations in money growth around year-end, the targets from 1976 to 1978 were formulated as point targets for the average growth of CBM over the previous year.

In 1979, two changes to the target formulation were made. First, with the exception of 1989, all targets have been formulated in terms of a target range of plus or minus 1 or 1.5 percent around the monetary target derived from the quantity equation.

> In view of the oil price hikes in 1974 and 1979-80, the erratic movements in "real" exchange rates and the weakening of traditional cyclical patterns, it appeared advisable to grant monetary policy from the outset limited room for discretionary maneuver in the form of such target ranges. To ensure that economic agents are adequately informed . . . the central bank must be prepared to define from the start as definitely as possible the overall economic conditions under which it will aim at the top or bottom end of the range. (Schlesinger 1983, p. 10)

In moving to a target range rather than a point target, the Bundesbank believed that, by giving itself room for response to changing developments, it could hit the target range; in fact, the tone of its explanation suggests that it was conferring some discretion upon itself rather than buying room for error in a difficult control problem.

The second change made in 1979 was to reformulate the targets as growth rates of the average money stock in the fourth quarter over the average money stock in the previous year in order to indicate "the direction in which monetary policy is aiming more accurately than an average target does" (Deutsche Bundesbank 1979b, January, p. 8). Chart 3 (p. 34) depicts quarterly growth rates of CBM (through 1987) and M3 (thereafter) over the fourth-quarter level of the previous year and the targets since 1979 (the earlier targets are omitted because they were not formulated in terms of year-on-year rates).

The Bundesbank has repeatedly stressed that situations may arise where it would consciously allow deviations from the announced target path to occur in order to support other economic objectives. These allowances are beyond and in addition to those implicit in the setting of a target range and of a gradual path for movements in unavoidable inflation. A case in point is the year 1977, when signs of weakness in economic activity, combined with a strong appreciation of the deutsche mark, prompted the Bundesbank to tolerate the overshooting of the target. As said at the time:

> However, the fact that the Bundesbank deliberately accepted the risk of a major divergence from its quantitative monetary target does not imply that it abandoned the more medium-term orientation which has marked its policies since 1975. . . . There may be periods in which the pursuit of an "intermediate target variable," as reflected in the announced growth rate of the central bank money stock, cannot be given priority. (Deutsche Bundesbank 1978a, p. 22)

The main reason why CBM was initially chosen as the target aggregate was the Bundesbank's perception of CBM's advantages in terms of transparency and communication to the public. The Bundesbank explained its choice of CBM in the following words:

> [CBM] brings out the central bank's responsibility for monetary expansion especially clearly. The money creation of the banking system as a whole and the money creation of the central bank are closely linked through currency in circulation and the banks' obligation to maintain a certain portion of their deposits with the central bank. Central bank money, which comprises these two components, can therefore readily serve as an indicator of both. A rise by a certain rate in central bank money shows not only the size of the money creation of the banking system but also the extent to which the central bank has provided funds for the banks' money creation. (Deutsche Bundesbank 1976a, p. 12)

Although at any point in time CBM is a given quantity from the Bundesbank's point of view because of the minimum reserve requirements, the choice of CBM nevertheless also reflects the monetary policy stance in the recent past. It is worth noting that this use of CBM to publicly track the monetary stance is consistent with the Bundesbank's focus on having minimum reserve requirements (as seen in the Bank's advocacy of such requirements for the unified European currency). The information being

conveyed by CBM in this context, however, is not so much to prevent either the public or the central bank from making a large mistake about the unclear stance of monetary policy (a major concern in the framework design of inflation targeters such as Canada), but to give rapid feedback about the state of monetary conditions in general. The mindset is that monetary control provides useful information about policy and lowers policy uncertainty.

The Bundesbank's confidence that it can explain target deviations and redefinitions to the public is reflected in the design of its reporting mechanisms. There is no legal requirement in the Bundesbank Act or in later legislation for the Bundesbank to give a formal account of its policy to any public body. The independence of the central bank in Germany limits government oversight to a commitment that "the Deutsche Bundesbank shall advise the Federal Cabinet on monetary policy issues of major importance, and shall furnish it with information upon request" (Act Section 13). The only publications that the Bundesbank is required to produce are announcements in the *Federal Gazette* of the setting of interest rates, discount rates, and the like (Act Section 33). According to Act Section 18, the Bundesbank may at its discretion publish the monetary and banking statistics that it collects.

The Bundesbank chooses to make heavy use of this opportunity. On the inside front cover, the *Monthly Report* is described as a response to Section 18 of the Bundesbank Act, but it does much more than report statistics. Every month, after a "Short Commentary" on monetary developments, securities markets, public finance, economic conditions, and the balance of payments, there appear two to four articles on a combination of onetime topics (for example, "The State of External Adjustment after German Reunification") and recurring reports (for example, "The Profitability of German Credit Institutions" [annual] and "The Economic Scene in Germany" [quarterly]). Each year in January, the monetary target and its justification are printed (between 1989 and 1992, the target and justification were available in December). The *Annual Report* gives an extremely detailed retrospective of economic, not just monetary, developments in Germany for the year, lists all monetary policy moves, and offers commentary on the fiscal policy of the federal government and the *Länder*.[8] Between these two publications, and regularly updated "special publications" such as *The Monetary Policy of the Bundesbank* (an explanatory booklet), no Bundesbank policy decision is left unexplained with respect to both its immediate impact and its short- and long-term effects.

The Bundesbank's commitment to transparency does not come without self-imposed limits on its accountability. Two limitations in particular provide a strong contrast to the inflation report documents prepared by central banks in Canada, the United Kingdom, and other countries in recent years. First, no articles in the *Monthly Report* are signed either individually or collectively by authors, and the *Annual Report* has only a brief foreword signed by the Bundesbank President (although all Council members are listed on the pages preceding it). Speeches by the President or other Council members are never reprinted in either document. This depersonalization of policy is to some extent made up for by the enormously active speaking and publishing schedule that all Council members (not just the President and Chief Economist) and some senior staffers engage in, but the fact of depersonalized reports still weakens the link between the main policy statements and the responsible individuals.

The second limitation on accountability is that the *Monthly Report* and the *Annual Report* always deal with the current situation or assess past performance[9]—no forecasts of any economic variable are made public by the Bundesbank, and private sector forecasts or even expectations are not discussed. The Bundesbank makes itself accountable on the basis of its explanations for past performance, but it does not leave itself open to be evaluated as a forecaster. In fact, its ex post explanations, combined with its potential GDP and normative inflation basis for the monetary targets, enable the Bundesbank to shift responsibility for short-term economic performance to other factors at any time. Nevertheless, those same monetary targets are seen by the Bundesbank as the main source of accountability and transparency because they commit the Bundesbank to explaining policy with respect to a benchmark on a regular basis.

German Monetary Policy under Monetary Targeting

The history of the German experience with inflation and monetary targeting up until 1990 has been discussed elsewhere (for example, see Bernanke and Mishkin [1992] and Neumann and von Hagen [1993]). Rather than review the entire history of German monetary targeting, we start by highlighting events through the 1970s and 1980s that are illustrative of certain themes discussed above—particularly the treatment of the monetary targets not as rigid rules but as a means of structured transparency for monetary policy.

Then, the bulk of our discussion focuses on the challenging episode of German monetary unification. In that instance, the Bundesbank successfully handled a (by definition) onetime inflationary shock of great magnitude and politically sensitive developments in the real economy through flexibility and communication. Close examination of this episode also illustrates how the Bundesbank has operated its monetary targeting regime in the 1990s and provides a baseline for the three inflation targeters we examine next. Charts 1-4 (pp. 33-4) track the path of inflation, interest rates, monetary growth, GDP growth, and unemployment before and after monetary union.

It is fair to generalize that in the 1970s and 1980s the Bundesbank frequently over- and undershot its annual monetary targets; it reversed overshootings in most but not all cases. In addition, the Bundesbank responded to movements in other variables besides inflation. From the beginning of CBM targeting in 1975, the Bundesbank was aware of the risk that "central bank money is prone to distortions caused by special movements in currency in circulation" (Deutsche Bundesbank 1976a, p. 11). In 1977, the Bundesbank allowed CBM growth to exceed the target in the face of an appreciating deutsche mark and weak economic activity.[10] At that early time, only two years after the adoption of the targets, the Bundesbank relied on the power of its explanation that "there may be periods in which the pursuit of an 'intermediate target variable' . . . cannot be given priority," acknowledging the importance of intervening real and foreign exchange developments in its decision making (Deutsche Bundesbank 1978a, p. 2).

In 1981 and early 1982, CBM grew much more slowly than M3 because of weakness in the deutsche mark, leading to large-scale repatriation of deutsche mark notes and an inverted yield curve that caused portfolio shifts out of currency into high-yielding short-term assets. Accordingly, the monetary target for 1981 of 4 to 7 percent was undershot (Chart 3, p. 34); since during this period the Bundesbank was pursuing a disinflationary course, and progress was being made on the inflation front, the central bank did not act to bring money growth up into target range.

In 1986 and 1987, the reverse situation—a strong deutsche mark combined with historically low short-term interest rates—led to CBM growth of 7.7 percent and 8 percent, respectively, while M3 grew at 7 percent and 6 percent during those two years, so that all measures exceeded the target monetary growth range. The Bundesbank's allowance of this overshooting could be seen as part of the results of the Plaza Accord on the Group of Seven exchange rates as well. The latter development prompted the Bundesbank to announce a switch in 1988 to monetary targets for the aggregate M3:

> The expansion of currency in circulation is in itself of course a significant development which the central bank plainly has to heed. This is, after all, the most liquid form of money . . . and not least the kind of money which the central bank issues itself and which highlights its responsibility for the value of money. On the other hand, especially at times when the growth rates of currency in circulation and deposit money are diverging strongly, there is no reason to stress the weight of currency in circulation unduly. (Deutsche Bundesbank 1988b, March, "Methodological Notes on the Monetary Target Variable 'M3,'" pp. 18-21)

The fact that the Bundesbank changed the target variable when CBM grew too fast, but did not do so when it grew too slowly, can be interpreted as an indication of the importance that the Bundesbank attaches to the communicative function of its monetary targets. Allowing the target variable to repeatedly overshoot the target because of special factors to which the Bundesbank did not want to react might have led to the misperception on the part of the public that the Bundesbank's attitude toward monetary control and inflation had changed.[11]

An econometric argument has been made by Clarida and Gertler (1997) that the Bundesbank has displayed an asymmetry in reacting to target misses; that is, it usually raises interest rates in response to an overshooting of the target, but it does not lower interest rates in response to an undershooting. In any event, the switch in targeted monetary aggregates was not accompanied by any other alterations in the monetary framework, and the perceived need for the switch did not seem to occasion much concern. In short, as long as the underlying inflation goal was met over the medium term, the existence of the monetary targets rather than their precise functionality was sufficient.

As noted in the previous section's discussion of unavoidable price increases (later termed normative levels of price increase) underlying the Bundesbank's monetary targets, the Bundesbank has tended to pursue disinflation gradually when inflationary shocks occur. The Bundesbank's response to the 1979 oil-induced supply shock was very gradual and publicly stated to be so—the Bundesbank set its level of unavoidable price inflation for 1980 at 8 percent, clearly below the then-prevailing rate, but also clearly above the level of price inflation that was acceptable over the longer term. The target inflation level was brought down in stages, eventually returning to the long-run goal of 2 percent only in 1984. Even though the underlying intent was clear, each year's target unavoidable inflation level (as well as the monetary target and interest rate policies determined by that level) was actually set only a year ahead, allowing the Bundesbank still further flexibility to respond to events and to rethink the pace of disinflation. Although what turned out to be four years of marked inflation reduction is hardly an instance of the Bundesbank going easy on inflation, it is an illustration of flexibility and concern for the real-side economic effects of German monetary policy.

The economic situation in the Federal Republic of Germany during the two years prior to economic and monetary union with the German Democratic Republic (GDR) on July 1, 1990, ("monetary union") was characterized by GDP growth of around 4 percent and the first significant fall in unemployment since the late 1970s (Chart 4, p. 34). After a prolonged period of falling inflation and historically low interest rates during the mid-1980s, inflation had increased from -1 percent at the end of 1986 to slightly more than 3 percent by the end of 1989. The Bundesbank had begun tightening monetary policy in mid-1988, raising the repo rate in steps from 3.25 percent in June 1988 to 7.75 percent in early 1990. After the first M3 target of 3 to 6 percent had been overshot in 1988 by 1 percent, the target for M3 growth of around 5 percent in 1989 was almost exactly achieved, with M3 growing at 4.7 percent. M3 growth was certainly not high in view of the prevailing rate of economic growth.

In response to the uncertainties resulting from the prospect of German reunification, long-term interest rates had increased sharply from late 1989 until March 1990, with ten-year bond yields rising from around 7 percent to around 9 percent in less than half a year. Combined with a strong deutsche mark, this rise in long-term interest rates allowed the Bundesbank to keep official interest rates unchanged during the months immediately preceding monetary union. In the immediate aftermath of monetary union it kept official interest rates unchanged as well, despite the fact that the effects of the massively expansionary fiscal policy accompanying reunification were beginning to propel GDP growth to record levels.

To some extent, the Bundesbank's decision to keep official interest rates unchanged for the first few months following monetary union was due to the fact that the inflationary potential resulting from the conditions under which the GDR mark had been converted into deutsche marks was very difficult to assess. The Bundesbank had been opposed to the conversion rate agreed to in the treaty on monetary union (on average about 1 to 1.8) and had been publicly overruled on this point by the federal government.[12] The money stock M3 had increased almost 15 percent because of monetary union. The rate of conversion chosen turned out to be almost exactly right. While GDP in the former GDR was estimated to be only around 7 percent of the Federal Republic's once reunification took place, with the vast government transfers to the east all of the money was absorbed (see König and Willeke [1996]). During the first few months following monetary union, the Bundesbank was preoccupied as well with assessing the

portfolio shifts in east Germany in response to the introduction not only of a new currency, but also of a new financial system and a broad range of assets that had not previously existed there.

As the east German banks were adjusting to their new institutional structure, and velocity was destabilized by portfolio shifts in east Germany, monetary data that included east Germany were hard to interpret. The Bundesbank therefore continued during the second half of 1990 to calculate monetary aggregates separately for east and west Germany, based on the returns of the banks domiciled in the respective parts. Although M3 growth in west Germany accelerated in late 1990 as a result of the moderate growth rates during the first half of the year, growth of M3 during 1990 of 5.6 percent was well within the target range of 4 to 6 percent.

During the fall of 1990, the repo rate had approached the lombard rate, which meant that banks were increasingly using the lombard facility for their regular liquidity needs and not as the emergency facility for which the Bundesbank intended lombard loans to be used. On November 2, 1990, the Bundesbank raised the lombard rate from 8 to 8.5 percent as well as the discount rate from 6 to 6.5 percent. Within the next few weeks, however, banks bid up the interest rate (*Mengentender*), and the repo rate rose above the lombard rate, prompting the Bundesbank to raise the lombard rate to 9 percent as of February 1, 1991. With these measures, the Bundesbank was reacting to both the volatile GDP growth rates and the faster M3 growth in the last part of 1990. Inflation had until then remained fairly steady, but it seems likely that the Bundesbank at that point was probably expecting inflationary pressures to develop in the near future given the fiscal expansion, the overstretched capacities in west Germany, and the terms of monetary union.

At the end of 1990, the Bundesbank announced a target range for M3 growth of 4 to 6 percent for the year 1991, applying a monetary target for the first time to the whole currency area. The target was based on the average all-German M3 stock during the last quarter of 1990. As this stock was still likely to be affected by ongoing portfolio shifts in east Germany, the target was subject to unusually high uncertainty. It is worth noting that neither the basic inputs into the quantity equation that generates the Bundesbank's money growth targets' normative inflation nor the potential growth rate of the German economy was changed.[13]

> Following German unification, the monetary targets set by the Bundesbank were decidedly ambitious as they left normative inflation, on which these targets are based, unchanged at 2% during this period, even though it was obvious from the outset that this rate could not be achieved in the target periods concerned. (Issing 1995a)

This statement was one of policy—the reunification shock did not fundamentally alter the basic structures of the German economy. Moreover, this statement communicated to the public at large that any price shifts coming from this shock should be treated as a onetime event and not be passed on to inflationary expectations.

This stance required faith in the public's comprehension of, and the Bundesbank's ability to credibly explain, the special nature of the period. It is important to contrast this adherence to the 2 percent medium-term inflation goal with the Bundesbank's response to the 1979 oil shock, when, as already noted, unavoidable inflation was ratcheted up to 8 percent and brought down only slowly. There are two explanations for the difference in policy response in the 1990-93 period, neither of which excludes the other: first, the monetary unification shock was a demand rather than a supply shock, and so the Bundesbank was correct not to accommodate it; and second, after several years of monetary targeting, the Bundesbank's transparent explanations of monetary policy had trained the public to discern the differences between onetime price-level increases and persistent inflationary pressures. In any event, the Bundesbank was clearly allowing its short-term monetary policy to miss the targets in pursuit of the longer term goal.

Following the Bundesbank's target announcement stressing its continued adherence to monetary targeting after reunification and the lombard rate increase on February 1, long-term interest rates started falling for the first time since 1988. In hindsight, it is apparent that this was

the beginning of a downward trend that continued until the bond market slump in early 1994. Although the highest inflation rates were still to come, at this point financial markets were apparently convinced that the Bundesbank would succeed in containing, if not reducing, inflation in the long run. By making it clear that it would not accommodate further price increases in the medium term, the Bundesbank bought itself flexibility for short-term easing without inviting misinterpretation. This link between transparency and enhanced flexibility, of course, depends upon the central bank's commitment to price stability being credible, but it emphasizes how even a credible central bank may gain through institutional design to increase transparency.

Until mid-August 1991, the Bundesbank left the discount and lombard rates unchanged, while the repo rate steadily edged up toward the lombard rate of 9 percent. CPI inflation in west Germany had still remained around 3 percent during the first half of 1991, while GDP growth remained vigorous. M3 growth, by contrast, was falling compared with its upward trend during late 1990, in part because of faster than expected portfolio shifts into longer term assets in east Germany.

These portfolio shifts, as well as the sharper than expected fall in the GDR's production potential, led the Bundesbank for the first time ever to change its monetary target on the occasion of its midyear review. The target for 1991 was lowered by 1 percent, to 3 to 5 percent. The fact that monetary targets are rarely reset is critical to any change being accepted without being perceived as a dodge by the central bank.

In this instance, the Bundesbank was able to invoke the implicit escape clause built into the semiannual target review. That formalized process, which required a clear explanation for any shift in targets, gave a framework for the Bundesbank to justify its adjustment. The discipline of the monetary targeting framework displayed the framework's disadvantages as well: that is, the difficulty of meeting short-run targets stemming from the instability of money demand and the inability to forecast changes in the monetary aggregate's relationship to goal variables.

As the repo rate approached the lombard rate again, the Bundesbank, on August 16, 1991, raised the lombard rate from 9 to 9.25 percent and the discount rate from 6.5 to 7.5 percent. The discount rate was raised to reduce the subsidy character of banks' rediscount facilities, which the Bundesbank had tolerated as long as the east German banks relied mostly on rediscount credit for the provision of their liquidity.

Despite the fact that GDP growth started to slacken during the second half of 1991, M3 growth accelerated. To some extent, the faster growth of M3 was a result of the by-then inverted yield curve, which led to strong growth of time deposits and prompted banks to counter the outflow from savings deposits by offering special savings schemes with attractive terms. This period was the first time that the yield curve had become inverted since the early 1980s and since the Bundesbank had been targeting M3. In this situation, the conflict arose for the Bundesbank that increases in interest rates were likely to foster M3 growth. This problem was all the more acute since banks' lending to the private sector was growing unabated despite the high interest rates, probably, to a large extent, because loan programs were subsidized by the federal government in connection with the restructuring of the east German economy and housing sector.

This conundrum, of the Bundesbank's instrument tending to work in the "wrong" direction, brought the underlying conflict of monetary targeting to the fore—the target must be critically evaluated constantly in relationship to the ultimate goal variable(s). However, if the target is cast aside regularly with reference to changes in that relationship or to special circumstances indicating a role for other intermediate variables, it ceases to serve as a target rather than solely as an indicator.

> Strictly defined, the use of a money growth target means that the central bank not only treats all unexpected fluctuations in money as informative in just this sense, but also, as a quantitative matter, changes its instrument variable in such a way as to restore money growth to the originally designated path. (Friedman and Kuttner 1996, p. 94)

The acceleration in late 1991 notwithstanding, M3 grew by 5.2 percent during 1991, close to the midpoint of the original target and just slightly above the revised target.

On December 20, 1991, the Bundesbank raised the lombard and discount rates by another 0.5 percent, to 9.75 percent and 8 percent, respectively, their highest levels since World War II (if the special lombard rates from the early 1970s are disregarded).

> In the light of the sharp monetary expansion, it was essential to prevent permanently higher inflation expectations from arising on account of the adopted wage and fiscal policy stance and the faster pace of inflation—expectations which would have become ever more difficult and costly to restrain. (Deutsche Bundesbank 1992a, p. 43)

The rhetoric invoked here by the Bundesbank is important to appreciate. Both government policies and union wage demands could be (and were) cited for their inflationary effects, that is, their pursuit of transfers beyond available resources. The Bundesbank may not have been able to override Chancellor Helmut Kohl's desired exchange rate of ostmarks for deutsche marks, or his "solidarity" transfers, but the Bundesbank Direktorium was comfortable in making it clear that the Kohl government and not the Bundesbank Direktorium should be held accountable for the inflationary pressures; the Bundesbank Direktorium took accountability for limiting the second-round effects of these pressures.

In addition to this division of accountability, the Bundesbank also clearly expressed some concern about the persistence of inflationary expectations and (if necessary) the cost of lowering them, thereby making clear its recognition of the substantial costs of disinflation even for a credible central bank. Finally, the Bundesbank's emphasis on the ultimate goal—medium-term price stability and inflation expectations—did not lead it to cite measures of private sector expectations directly—something, as we will see, many inflation targeters began doing at this time.

The December 20 increase in the lombard rate proved to be the last. During the first half of 1992, the repo rate slowly approached the lombard rate and peaked in August at 9.7 percent before starting to fall from late August onward, as the Bundesbank started to ease monetary policy in response to the appreciation of the deutsche mark and emerging tensions in the European Monetary System; of course, the decision to ease also coincided with the rapid slowdown in German GDP growth. The monetary targets for 1992 and 1993 would not be met, but the challenge to German monetary policy from reunification was over.

> Thus in 1992, for example, when the money stock overshot the target by a large margin, the Bundesbank made it clear by the interest rate policy measures it adopted, that it took this sharp monetary expansion seriously. The fact that, for a number of reasons, it still failed in the end to meet the target . . . has therefore ultimately had little impact on the Bundesbank's credibility and its strategy. (Issing 1995b)

Monetary policy transparency was explicitly linked to flexibility during reunification, at least according to Bundesbank Chief Economist Otmar Issing, and that flexibility was exercised to minimize the real economic and political effects of maintaining long-term price stability.

Over the past five years or so, however, M3 has continued to prove itself a problematic intermediate target, even after reunification. The Bundesbank's own explanations for the sizable fluctuations in annualized M3 growth since 1992 (Chart 3, p. 34) suggest that demand for M3 behaves more and more like that for a financial asset rather than that for a medium of exchange. While the Bundesbank, in justifying deviations from the M3 targets, has begun giving greater prominence to reports on "extended money stock M3," a still broader aggregate that includes some recently growing forms of money market accounts, it has given no signs of readiness to switch target aggregates again (see Deutsche Bundesbank [1995b, July, p. 28]).

The Bundesbank has repeatedly described itself as "fortunate" because financial relationships have been more stable in Germany than in other major economies that have tried monetary aggregate targeting. It has attributed this successful experience to the self-described earlier deregulation of financial markets in Germany and the lack of inflationary or regulatory inducement for financial firms to

pursue innovations. The targets continue as a structured framework by which the Bundesbank can regularly explain its monetary policy, even as the targets go unmet for periods of several years.[14]

In the December 1996 *Monthly Report*, the Bundesbank announced that it would set a target of 5 percent annualized growth in M3 in both 1997 and 1998. This is the first time since Germany adopted monetary targeting in 1975 that it has announced a multiyear monetary target. The explicit reason given for the multiyear target is to allow German monetary policy flexibility to respond to expected volatility in the currency markets in the run-up to European Monetary Union (EMU) in 1999, which would make these the last German monetary targets. Clearly, domestic price stability is balanced with other goals for the next two years and beyond, and flexibility, when viewed as publicly justifiable, is valued. Moreover, given the lags between movements in German monetary policy and their effects upon output and inflation, it is clear that the only variables that the Bundesbank can reasonably hope to influence significantly prior to EMU in 1999 are the evolving Exchange Rate Mechanism (ERM) parities.

The target range for M3 growth in 1997 will be 3.5 to 6.5 percent; the target range for 1998 will be announced at the end of 1997, apparently in response to the difference between actual M3 growth in 1997 and what is needed to achieve the 5 percent average. Bundesbank President Hans Tietmeyer indicated at the news conference announcing the new targets that the rate of annualized M3 growth in 1997-98 may be computed against the fourth quarter of 1995 rather than of 1996, because "comparison with the last quarter of 1996 can be a distortion." In 1996, M3 growth did exceed the Bundesbank's target range of 4 to 7 percent, with much of the difference being attributed to movements in narrow money in the last quarter as private households participated in the oversubscribed purchase of newly issued Deutsche Telecom stock. It is important to note as well, however, that 1996 inflation was at its lowest level in Germany since the adoption of monetary targets (1.4 percent growth in CPI)—and that the Bundesbank cut all three of its instrument interest rates to historical nominal lows—even as M3 growth exceeded the stated target.

The endgame nature of the current German monetary situation illustrates a point that is relevant for all inflation targeters with a fixed term for their targeting regime, a point that has not been relevant for Germany until now. When the end of the targeting regime is tied to a specific event—such as an election or a treaty commitment—it is not clear how much discipline the target imposes as that time approaches. A central bank could be less strict about target adherence in the early years of the period, making the claim that it will make up for temporary overshootings later. Yet, when this later time arrives, the commitment to return the targeted variable to a level required under the targeting regime will in effect predetermine the path of policy. The central bank is then unable to respond to economic events as they unfold unless it abandons the target.

In addition, the central bank may not be highly accountable for its monetary policy if the targeting regime is unlikely to be kept in place. If the central bank cannot be held accountable, then how can its target commitment be fully credible? This is not to suggest by any means that the Bundesbank will go "soft" on inflation in the run-up to EMU, but rather that it is best if target time horizons can be credibly extended before their expiration. As we will see in the case studies for both Canada and the United Kingdom, there was a need to reassure the public that targets would be maintained past election dates (and changes of political power).

Key Lessons from Germany's Experience

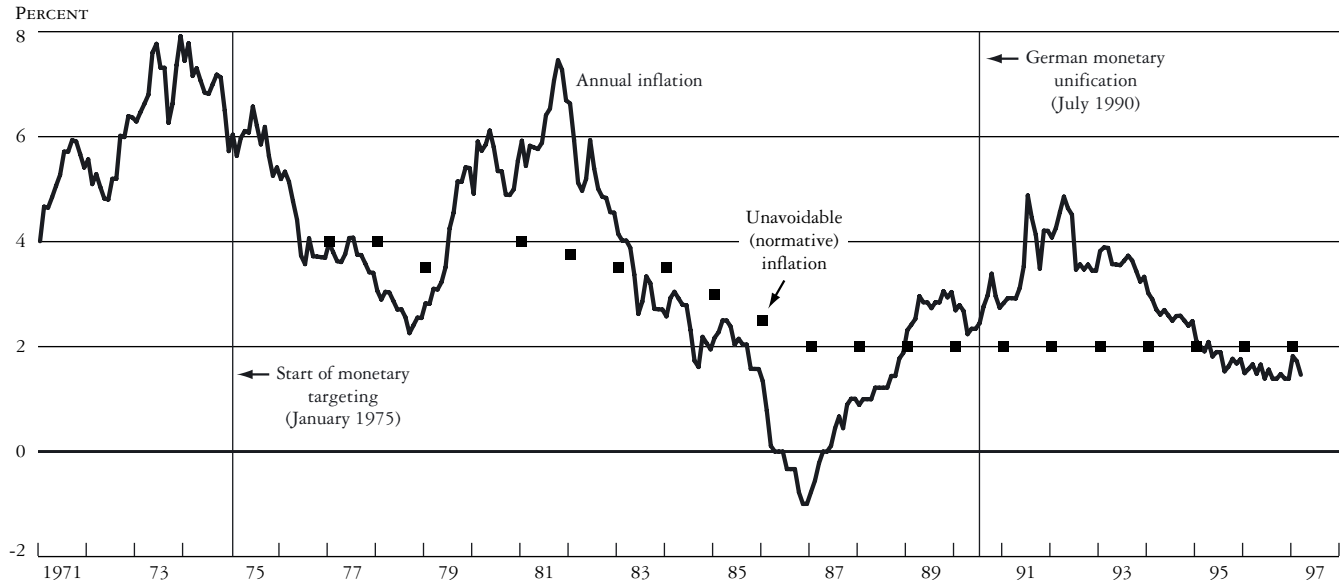
Germany's twenty years of experience with monetary targeting suggests two main lessons that are applicable to any targeting regime in which an inflation goal plays a prominent role. First, a targeting regime can be quite successful in restraining inflation even when the regime is flexible, allowing both significant overshootings and undershootings of the target in response to other short-run considerations. Indeed, German monetary targeting, although successful in keeping inflation low, must be seen as a significant departure from a rigid policy rule in which sub-

stantial target misses would not be tolerated.

Second, a key element of a successful targeting regime is a strong commitment to transparency. The target not only increases transparency by itself, but also serves as a vehicle to communicate often and clearly with the public and to promote an understanding of what the central bank is trying to achieve. We shall see that these key elements of a successful targeting regime—flexibility and transparency—have been present not only in the German case, but also in successful inflation-targeting regimes in other countries.

Chart 1

ANNUAL AND UNAVOIDABLE (NORMATIVE) INFLATION

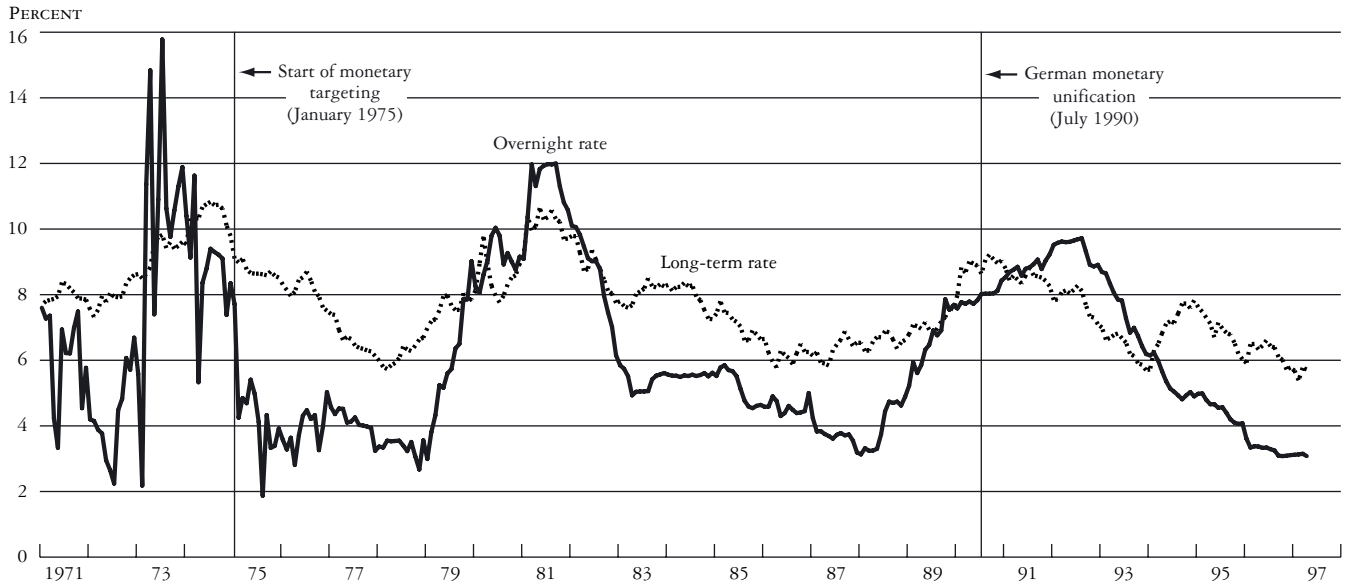


Sources: Deutsche Bundesbank; Bank for International Settlements.

Notes: "Unavoidable inflation" is the rate chosen by the Bundesbank for use in its quantity equation for monetary forecasts. In 1986, the Bundesbank renamed this rate "the rate of normative price increase."

Chart 2

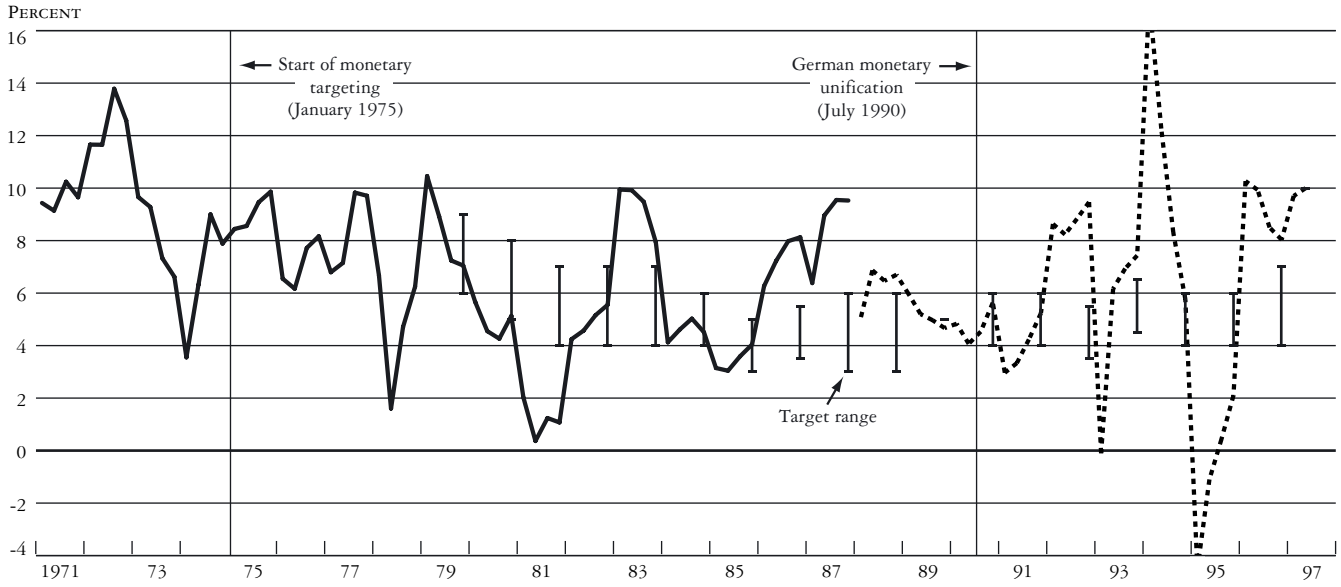
OVERNIGHT AND LONG-TERM INTEREST RATES



Source: Bank for International Settlements.

Chart 3

MONETARY GROWTH AND TARGETS

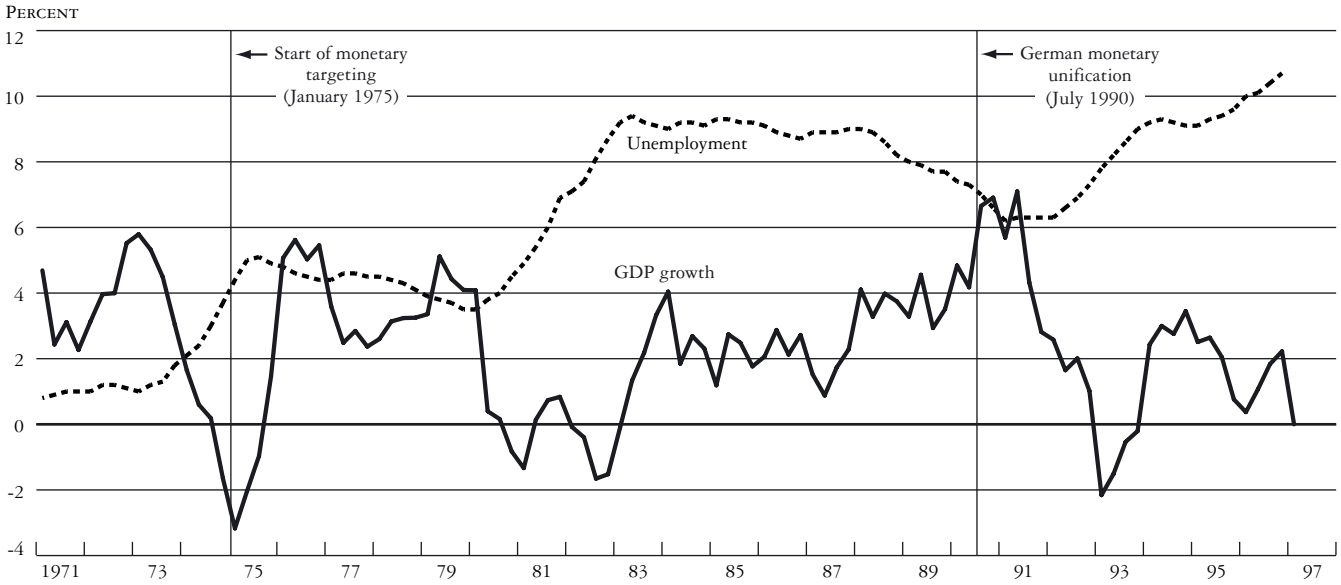


Sources: Deutsche Bundesbank; Bank for International Settlements.

Note: The shift to a dashed line indicates the change in the monetary aggregate targeted, from CBM (central bank money stock) to M3.

Chart 4

GDP GROWTH AND UNEMPLOYMENT



Sources: Bank for International Settlements; Organization for Economic Cooperation and Development, *Main Economic Indicators*.