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From Monetary Targeting to Inflation Targeting

Lessons from Industrialized Countries

Frederic S. Mishkin

Experience with *monetary targeting* suggests that although it successfully controlled inflation in Switzerland and especially Germany, the special conditions that made it work reasonably well in those two countries are unlikely to be satisfied elsewhere. *Inflation targeting* is more likely to improve economic performance in countries that choose to have an independent domestic monetary policy, but there are subtleties in how inflation targeting is done. Lessons from industrial countries should be useful to central banks designing a framework for monetary policy.

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Summary findings

Mishkin examines changes in monetary policy in industrial countries by evaluating and providing case studies of monetary targeting and inflation targeting.

Inflation targeting has successfully controlled inflation, with some qualifications. It weakens the effects of inflationary shocks, as examples from Canada, Sweden, and the United Kingdom show. It can promote growth and does not lead to increased fluctuations in output. But inflation targets do not necessarily reduce the cost of reducing inflation.

The key to the success of inflation targeting is its stress on transparency and communication with the public. Inflation targeting increases accountability, which helps ameliorate the time-inconsistency trap (in which the central bank tries to expand output and employment in the short run by pursuing overly expansionary monetary policy). Time-inconsistency is more likely to come from political pressures on the central bank to engage in overly expansionary monetary policy. A key advantage of inflation targeting is that it helps focus the political debate on what a central bank can do in the long run (control inflation) rather than what it cannot do (raise economic growth and the number of jobs permanently through expansionary monetary policy).

By increasing transparency and accountability, inflation targeting helps promote central bank independence. Accountability to the general public seems to work as well as direct accountability to the government. Inflation targeting is consistent with democratic principles.

In discussing operational design, Mishkin explains, among other things, that
- Inflation targeting is far from a rigid rule.
- Inflation targets have always been above zero with no loss of credibility.
- Inflation targeting does not ignore traditional stabilization goals.
- Avoiding undershoots of the inflation target is as important as avoiding overshoots.
- When inflation is initially high, inflation targeting may have to be phased in after disinflation.
- The edges of the target range can take on a life of their own.
- Targeting asset prices such as the exchange rate worsens performance.

FROM MONETARY TARGETING TO INFLATION TARGETING: LESSONS FROM THE INDUSTRIALIZED COUNTRIES

by

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I.
INTRODUCTION

In recent years, central banks in industrialized countries have made great strides in the conduct of monetary policy. Inflation has been reduced to levels that are consistent with price stability, while economic growth has not suffered: to the contrary, once price stability was achieved, growth rates of the aggregate economy have been high.

How has this improved performance of monetary policy come about? This paper looks at the evolution of monetary policy in industrialized countries by studying monetary targeting and inflation targeting, two basic strategies which allow monetary policy to focus on domestic considerations.[1] The paper provides brief case studies of countries that have adopted these two strategies and draws a set of lessons that should be valuable not only for industrialized countries but emerging market countries as well.

II.
MONETARY TARGETING:
EXPERIENCE IN INDUSTRIALIZED COUNTRIES

A monetary targeting strategy comprises three elements: 1) reliance on information conveyed by a monetary aggregate to conduct monetary policy, 2) announcement of targets for monetary aggregates, and 3) some accountability mechanism to preclude large and systematic deviations from the monetary targets.

In the 1970s, monetary targeting was adopted in several industrialized countries. Here we briefly describe that experience in the United States, Canada and the United Kingdom, in which monetary targeting was not particularly successful, and then go on to examine the experience in the more successful monetary targeters, Germany and Switzerland.[2]

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[1] I discuss monetary policy strategies which use exchange rate targets and thus cannot focus on domestic considerations in Mishkin (1999a).

[2] Bernanke and Mishkin (1992) and Mishkin and Posen (1997) contain more detailed discussion of these countries' experiences with monetary targeting.

United States, the United Kingdom and Canada.

Beginning in 1970, as a result of increasing concerns about inflation the FOMC of the Federal Reserve selected weekly tracking paths for M1 and indicated its preferred behavior for M2 (Meulendyke, 1990). Then in 1975, in response to a Congressional resolution, the Fed began to announce publicly its targets for money growth. In practice, however, the Fed did not consider achieving the money growth targets to be of high priority, placing higher weight on reducing unemployment and smoothing interest rates.[3] This is reflected in the fact that M1 growth had an upward trend after 1975 despite declining target ranges. Furthermore, unemployment declined steadily after 1975 with inflation rising sharply.

In October 1979, the Fed changed its operating procedures to deemphasize the federal funds rate as its operating target and supposedly increased its commitment to the control of monetary aggregates by adopting a non-borrowed reserves, operating target. However, this change in operating procedures did not result in improved monetary control: fluctuations in M1 growth increased, rather than decreased as might have been expected, and the Fed missed its M1 growth targets in all three years of the 1979-82 period. It appears (e.g., see Bernanke and Mishkin, 1992, and Mishkin, 2001) that controlling monetary aggregates was never the intent of the 1979 policy shift, but rather was a smokescreen to obscure the need of the Fed to raise interest rates to very high levels to reduce inflation. In addition, the growing unreliability of the relationship of monetary aggregates to nominal GDP and inflation, raised concerns that monetary aggregates were no longer useful as a guide to the conduct of monetary policy. In October 1982, with inflation in check, the Fed began to deemphasize monetary aggregates, and in February 1987, the Fed announced that it would no longer even set M1 targets. Finally, in July 1993, Alan Greenspan testified in Congress that the Fed would no longer use any monetary targets, including M2, as a guide for the conduct of monetary policy.

As in the United States, the United Kingdom introduced monetary targeting in the mid-1970s in response to mounting inflation concerns. Informal targeting of a broad aggregate, sterling M3, began in late 1973, and formal publication of targets began in 1976. The Bank of England had great difficulty in meeting its M3 targets in the 1976-79 period. Not only were announced targets consistently overshot, but the Bank of England frequently revised its targets midstream or abandoned them altogether. Although inflation fell subsequent to the 1973 oil

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[3]The Fed also pursued other objectives during the monetary targeting period such as the exchange rate and financial market stability.

price shock, starting in 1978, inflation in the United Kingdom began to accelerate again, reaching nearly 20% by 1980.

As in the United States, the perception of an inflationary crisis led to a change in strategy in early 1980, with Prime Minister Thatcher introducing the Medium-Term Financial Strategy which proposed a gradual deceleration of M3 growth. Unfortunately, the British monetary policy strategy ran into a technical problem similar to that experienced in the United States: the relationship between the targeted aggregate and nominal income became very unstable. After 1983, arguing that financial innovation was wreaking havoc with the relationship between M3 and nominal income, the Bank of England began to deemphasize M3 in favor of a narrower aggregate, M0 (the monetary base). The target for M3 was temporarily suspended in October 1985 and was dropped altogether in 1987. Until the British entered the ERM and pegged the value of the pound to the deutsche mark, M0 growth rate was not too far from its target ranges. However from 1987 to 1990, M0 growth was on the high side because the authorities wanted to stop the appreciation of the pound.

Canada also responded to its significant inflation problems by instituting monetary targeting in 1975 under a program of "monetary gradualism" in which M1 growth would be controlled with a gradually falling target range. Monetary gradualism was no more successful in Canada than were the attempts at monetary targeting in the United States and the United Kingdom. Although M1 growth was often close to target and the goal of reducing M1 growth wash achieved during the latter part of the 1970s, Canada like the other two countries experienced a resurgence of inflation. By 1978, only three years after monetary targeting had begun, the Bank of Canada began to distance itself from this strategy out of concern for exchange rate movements and uncertainty about M1 as a reliable guide to monetary policy. In November 1982, M1 targets were abandoned, with Gerald Bouey, the Governor of the Bank of Canada describing the situation by saying, "We didn't abandon monetary aggregates, they abandoned us."

A feature of monetary targeting in the United States, Canada and the United Kingdom was that there was substantial gameplaying in which their central banks targeted multiple aggregates, allowed base drift (by applying target growth rates to a new base at which the target ended up every period), did not announce targets on a regular schedule, used artificial means to bring down the growth of a targeted aggregate (the infamous "corset" in the United Kingdom), often overshot their targets without reversing the overshoot later, and often obscured

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why deviations from the monetary targets occurred.[4]

Monetary targeting in these three countries was not successful in controlling inflation and there are two interpretations for why this occurred. One is that because monetary targeting was not pursued seriously, as the central bank gameplaying described above suggests, it never had a chance to be successful. The other is that growing instability of the relationship between monetary aggregates and goal variables such as inflation (or nominal income) meant that this strategy was doomed to failure and indeed should not have been pursued seriously.

Germany and Switzerland.

Germany and Switzerland officially engaged in monetary targeting for over twenty years starting at the end of 1974. Their success in controlling inflation is the reason that monetary targeting still has strong advocates and is an element of the official policy regime for the European Central Bank.

The monetary aggregate chosen by the Germans was central bank money, a narrow aggregate which is the sum of currency in circulation and bank deposits weighted by the 1974 required reserve ratios. In 1988, the Bundesbank switched targets from central bank money to M3. The Swiss began targeting the M1 monetary aggregate, but in 1980 switched to the narrower monetary aggregate, M0, the monetary base.

The key fact about monetary targeting regimes in Germany and Switzerland is that the targeting regimes were very far from a Friedman-type monetary targeting rule in which a monetary aggregate is kept on a constant-growth-rate path and is the primary focus of monetary policy. As Otmar Issing, at the time the Chief Economist of the Bundesbank noted, "One of the secrets of success of the German policy of money-growth targeting was that ... it often did not feel bound by monetarist orthodoxy as far as its more technical details were concerned."[5] The Bundesbank allowed growth outside of its target ranges for periods of two to three years, and overshoots of its targets were subsequently reversed. Monetary targeting in Germany and Switzerland was instead primarily a method of communicating the strategy of monetary policy that focused on long-run considerations and the control of inflation.

The calculation of monetary target ranges put great stress on making policy transparent

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[4]See Bernanke and Mishkin (1992) and Mishkin (2001) for more details on the games that the central banks played.

[5]Otmar Issing, (1996), page 120.

(clear, simple and understandable) and on regular communication with the public. First and foremost, a numerical inflation goal was prominently featured in the setting of target ranges which was a very public exercise. The Bundesbank's setting of targets used a quantity theory equation to back out the monetary target growth rate using the numerical inflation goal, estimated potential output growth and expected velocity trends. Second, monetary targeting, far from being a rigid policy rule, was quite flexible in practice. The target ranges for money growth were missed on the order of fifty percent of the time in Germany, often because the Bundesbank's concern about other objectives, including output and exchange rates.[6] Furthermore, the Bundesbank demonstrated its flexibility by allowing its inflation goal to vary over time and to converge slowly to the long-run inflation goal quite gradually.

When the Bundesbank first set its monetary targets at the end of 1974, it announced a medium-term inflation goal of 4%, well above what it considered to be an appropriate long-run goal for inflation. It clarified that this medium-term inflation goal differed from the long-run goal by labelling it the "unavoidable rate of price increase". Its gradualist approach to reducing inflation led to a period of nine years before the medium-term inflation goal was considered to be consistent with price stability. When this occurred at the end of 1984, the medium-term inflation goal was renamed the "normative rate of price increases" and was set at 2% and continued at this level until 1997 when it was changed to 1.5 to 2%. The Bundesbank also responded to negative supply shocks, restrictions in the supply of energy or raw materials which raised the price level, by raising its medium-term inflation goal: specifically it raised the unavoidable rate of price increase from 3.5% to 4% in the aftermath of the second oil price shock in 1980.

The monetary targeting regimes in Germany and Switzerland demonstrated a strong commitment to the communication of the strategy to the general public. The money-growth targets were continually used as a framework for explanation of the monetary policy strategy and both the Bundesbank and the Swiss National Bank expended tremendous effort, both in their publications and in frequent speeches by central bank officials, to communicate to the public what the central bank was trying to achieve. Indeed, given that both central banks frequently missed their money-growth targets by significant amounts, their monetary-targeting frameworks are best viewed as a mechanism for transparently communicating how monetary policy was being directed to achieve their inflation goals and as a means for increasing the accountability of the central bank.

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[6]See Von Hagen (1995), Neumann (1996), Clarida and Gertler (1997), Mishkin and Posen (1997) and Bernanke and Mihov (1997).

Germany's monetary-targeting regime was successful in producing low inflation and its success has been envied by many other countries, explaining why it was chosen as the anchor country for the Exchange Rate Mechanism. One clear indication of Germany's success occurred in the aftermath of German reunification in 1990. Despite a temporary surge in inflation stemming from the terms of reunification, high wage demands, and the fiscal expansion, the Bundesbank was able to keep these temporary effects from becoming embedded in the inflation process, and by 1995, inflation fell back down below the Bundesbank's normative inflation goal of 2%.

Monetary targeting in Switzerland has been more problematic than in Germany, suggesting the difficulties of targeting monetary aggregates in a small open economy which also underwent substantial changes in the institutional structure of its money markets. In the face of a 40% trade-weighted appreciation of the Swiss franc from the fall of 1977 to the fall of 1978, the Swiss National Bank decided that the country could not tolerate this high a level of the exchange rate. Thus, in the fall of 1978 the monetary targeting regime was abandoned temporarily, with a shift from a monetary target to an exchange-rate target until the spring of 1979, when monetary targeting was reintroduced although it was not announced.

The period from 1989 to 1992 was also not a happy one for Swiss monetary targeting because Swiss National Bank failed to maintain price stability after it successfully reduced inflation (e.g., see Rich, 1997). The substantial overshoot of inflation from 1989 to 1992, reaching levels above 5%, was due to two factors. The first was that the strength of the Swiss franc from 1985 to 1987 caused the Swiss National Bank to allow the monetary base to grow at a rate greater than the 2% target in 1987 and then caused it to raise the money-growth target to 3% for 1988. The second arose from the introduction of a new interbank payment system, Swiss Interbank Clearing (SIC), and a wide-ranging revision of the commercial banks' liquidity requirements in 1988. The result of the shocks to the exchange rate and the shift in the demand for monetary base arising from the above institutional changes created a serious problem for its targeted aggregate. As the 1988 year unfolded, it became clear that the Swiss National Bank had guessed wrong in predicting the effects of these shocks so that monetary policy was too easy even though the monetary target was undershot. The result was a subsequent rise in inflation to above the 5% level.

As a result of these problems with monetary targeting Switzerland was substantially loosened its monetary targeting regime. The Swiss National Bank recognized that its money-growth targets were of diminished utility as a means of signaling the direction of monetary policy. Thus, its announcement at the end of 1990 of the medium-term growth path did not specify a horizon for the target or the starting point of the growth path. At the end of 1992 the

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Bank specified the starting point for the expansion path and at the end of 1994, it announced a new medium-term path for money base growth for the period 1995 to 1999. By setting this path, the Bank revealed retroactively that the horizon of the first path was also five years (1990-95). Clearly, the Swiss National Bank moved to a much more flexible framework in which hitting one-year targets for money base growth was abandoned. Nevertheless, Swiss monetary policy continued to be successful in controlling inflation, with inflation rates falling back down below the 1% level after the temporary bulge in inflation from 1989-1992. In 1999, the Swiss effectively moved to an inflation targeting regime, but with a special role for money as an information variable.

III.
LESSONS FROM
THE MONETARY TARGETING EXPERIENCE

There are three basic lessons to be learned from our discussion of monetary targeting in the United States, the United Kingdom, Canada, Germany and Switzerland.

The Instability of the Relationship Between Monetary Aggregates and Goal Variables (inflation and nominal income) Make Monetary Targeting Problematic.
As we have seen from the experience with monetary targeting described above, the relationship between monetary aggregates and goal variables such as inflation is often very unstable. As a result, monetary targeting has either been downplayed or abandoned (as in the United States, the United Kingdom and Canada), or alternatively when followed too closely has led to some serious policy mistakes (as in Switzerland). Even in Germany, the relationship between monetary aggregates and nominal income and inflation has not been very close (e.g., Estrella and Mishkin, 1997) and this helps explain why the Bundesbank was willing to miss its target ranges half the time. A similar problem of instability of the money-inflation relationship has been found in emerging market countries, such as those in Latin America (Mishkin and Savastano, 2000.)

The weak relationship between money and nominal income implies that hitting a monetary target will not produce the desired outcome for a goal variable such as inflation. Furthermore, the monetary aggregate will no longer provide an adequate signal about the stance of monetary policy. Thus, except under very unusual circumstances, monetary targeting will

not help fix inflation expectations and be a good guide for assessing the accountability of the central bank. In addition, an unreliable relationship between monetary aggregates and goal variables makes it difficult for monetary targeting to serve as a communications device that increases the transparency of monetary policy and makes the central bank accountable to the public.

The Key to Success for Monetary Targeting is an Active Engagement in Communication which Enhances Transparency and Accountability of the Central Bank. The experience of Germany and Switzerland shows monetary targeting can be used successfully if it is actively used to clearly communicate a long-run strategy of inflation control. Both central banks in these two countries used monetary targeting to clearly state the objectives of monetary policy and to explain that policy actions remained focused on long-run price stability when targets were missed. The active communication with the public by the Bundesbank and the Swiss National Bank increased transparency and accountability of these central banks. In contrast, the game playing which was a feature of monetary targeting in the United States, the United Kingdom and Canada hindered the communication process so that transparency and accountability of the central banks in these countries was not enhanced.

Because explanations of target misses are necessarily complicated, monetary targeting will only be effective for inflation control if the public is sophisticated about monetary matters and holds the central bank in such high regard that it trusts their explanations. Switzerland and especially Germany satisfy these conditions, because the public cares so much about avoiding high inflation and because of the excellent track record of their central banks in preventing high inflation. However, very few other countries have these characteristics that made monetary targeting work for Germany and Switzerland, and this is why I have argued in Mishkin (1999) against the use of monetary aggregates as a key "pillar" in the monetary policy strategy of the European Central Bank. Given the low credibility of central banks in emerging market countries, there is an even stronger case that monetary targeting is unlikely to produce good outcomes for these countries.

Monetary Targeting Has Been Very Flexible in Practice and a Rigid Approach Has Not Been Necessary to Obtain Good Inflation Outcomes. The case studies above show that all monetary targeters have been quite flexible in their approach and have not come even close to following a rigid rule. All have shown that they have objectives over and above price

stability, such as concerns about the exchange rate, financial instability and output fluctuations. Despite a flexible approach to monetary targeting which included tolerating target misses and gradual disinflation, Germany and Switzerland have demonstrated that flexibility is consistent with successful inflation control. The key to success has been seriousness about pursuing the long-run goal of price stability and actively engaging public support for this task.

As we see in the next section, these key elements of a successful targeting regime -- flexibility, transparency and accountability - are also important elements in inflation-targeting regimes. I would argue that German and Swiss monetary policy was actually far closer in practice to inflation targeting than it is to Friedman-like monetary targeting, and thus might best be thought of as "hybrid" inflation targeting. This is why it was so natural for Switzerland to move toward an inflation targeting regime recently and why the European Central Bank has placed an inflation goal of 0 to 2% as a central pillar of their monetary policy strategy.

IV.
INFLATION TARGETING:
EXPERIENCE IN INDUSTRIALIZED COUNTRIES

Inflation targeting involves five key elements: 1) public announcement of medium-term numerical targets for inflation; 2) an institutional commitment to price stability as the primary, long-run goal of monetary policy and a commitment to achieve the inflation goal; 3) an information inclusive strategy in which many variables and not just monetary aggregates are used in making decisions about monetary policy; 4) increased transparency of the monetary policy strategy through communication with the public and the markets about the plans and objectives of monetary policymakers; and 5) increased accountability of the central bank for attaining its inflation objectives.

With the problems encountered with monetary targeting in the 1970s and 80s, inflation targeting was adopted in a number of industrialized countries in the 1990s, starting with New Zealand in 1990, with Canada following in February 1991, Israel in December 1991, the United Kingdom in 1992, Sweden and Finland in 1993, Australia in 1994 and Spain in 1994. The case studies focus on New Zealand, Australia, Canada and the United Kingdom, from whose

experience the key lessons follow.[7]

New Zealand and Australia

After bringing inflation down from almost 17% in 1985 to the vicinity of 5% by 1989, the New Zealand parliament passed a new Reserve Bank of New Zealand Act in 1989, that became effective on February 1, 1990. Besides increasing the independence of the central bank, moving it from being one of the least independent to one of the most independent among the industrialized countries, the act also committed the Reserve Bank to a sole objective of price stability. The act stipulated that the Minister of Finance and the Governor of the Reserve Bank should negotiate and make public a Policy Targets Agreement which sets out the targets by which monetary policy performance would be evaluated. These agreements have specified numerical target ranges for inflation and the dates by which they were to be reached. An unusual feature of the New Zealand legislation is that the Governor of the Reserve Bank is held highly accountable for the success of monetary policy. If the goals set forth in the Policy Targets Agreement are not satisfied, the Governor is subject to dismissal.

The first Policy Targets Agreement, signed by the Minister of Finance and the Governor of the Reserve Bank on March 2, 1990, directed the Reserve Bank to achieve an annual inflation rate of 3 to 5% by the end of 1990 with a gradual reduction in subsequent years to a 0 to 2% range by 1992 (changed to 1993), which was kept until the end of 1996 when the range was changed to 0-3%. As a result of tight monetary policy, the inflation rate was brought down from above 5% to below 2% by the end of 1992, but at the cost of a deep recession and a sharp rise in unemployment. From 1992 to 1996, New Zealand's inflation remained low, the growth rate was very high, with some years exceeding 5%, and unemployment came down significantly.

Like Germany's monetary targeting regime, New Zealand's inflation targeting regime had a fair degree of flexibility built in. First, as we have seen above, the target range was lowered gradually to the long-run price stability goal. As Svensson (1997) had shown, a gradual movement of the inflation target toward the long-run, price-stability goal indicates that output fluctuations are a concern (in the objective function) of monetary policy. Second, the Reserve Bank emphasized that the floor of the range should be as binding a commitment as the floor,

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[7]Further details on the inflation targeting experience in industrialized countries can be found in Leiderman and Svensson (1995), Mishkin and Posen (1997), Bernanke, Laubach, Mishkin and Posen (1999).

indicating that it cared about output fluctuations as well as inflation. As a result it acted to ease monetary policy as early as September 1991 in order to prevent inflation from falling below the target range. Third, the regime has escape clauses to allow the Reserve Bank to accommodate specific shocks to inflation including significant changes in the terms of trade, changes in indirect taxes that affect the price level, and supply shocks such as a major livestock epidemic.

Despite the flexibility in New Zealand's inflation targeting regime, there were rigid elements: the one-year horizon for its inflation target, the initial narrow range of its target, and the potential dire penalty for the Governor if inflation breached the target by even a small amount. These rigid elements led to two serious problems: 1) controllability, i.e., the difficulty in keeping inflation within a narrow target range, and 2) instrument instability, i.e., occasional wide swings in the instruments of monetary policy, interest rates and exchange rates. In 1995, the Reserve Bank of New Zealand overshot its one-year-horizon inflation target range by a few tenths of a percentage point, making the governor subject to dismissal under the central banking law. It was recognized in the Reserve Bank that the overshoot was likely to be short-lived and inflation was likely to fall, indicating that monetary policy had not been overly expansionary. Fortunately, this view was accepted outside the Bank and the governor, Don Brash, whose performance was excellent, retained his job.

Attempting to hit the annual target did, however, have the unfortunate consequence of producing excessive swings in the monetary policy instruments, especially the exchange rate. In a small, open economy, like New Zealand, exchange rate movements have a faster impact on inflation than interest rates. Thus trying to achieve annual inflation targets required heavier reliance on manipulating exchange rates which led to large swings. By trying to hit the short-horizon target, the Reserve Bank also may have induced greater output fluctuations. For example, the Reserve Bank pursued overly tight monetary policy at the end of 1996 with the overnight cash rate going to 10% because of fears that inflation would rise above the target range in 1997. This helped lead to an undesirable decline in output.

The focus on the exchange rate led to its further institutionalization by the Reserve Bank which early in 1997 adopted as its primary indicator of monetary policy a Monetary Conditions Index (MCI) similar to that developed originally by the Bank of Canada. The idea behind the MCI, which is a weighted average of the exchange rate and a short-term interest rate, is that both interest rates and exchange rates on average have offsetting impacts on inflation. When the exchange rate falls, this usually leads to higher inflation in the future, and so interest rates need to rise to offset the upward pressure on inflation.

The problem with the MCI concept is that the offsetting effects of interest rates and exchange rates on inflation depend on the nature of the shocks to the exchange rates. If the

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exchange rate depreciation comes from portfolio considerations, then it does lead to higher inflation and needs to be offset by an interest rate rise. On the other hand, if the reason for the exchange rate depreciation is a real shock, such as a negative terms of trade shock which decreases the demand for a country's exports, then the situation is entirely different. The negative terms of trade shock reduces aggregate demand and is likely to be deflationary. The correct interest rate response is then a decline in interest rates, not a rise as the MCI suggests.

With the negative terms of trade shock in 1997, the adoption of the MCI in 1997 led to exactly the wrong monetary policy response to East Asian crisis. With depreciation setting in after the crisis began in July 1997 after the devaluation of the Thai baht, the MCI began a sharp decline, indicating that the Reserve Bank needed to raise interest rates, which it did by over 200 basis points. The result was very tight monetary policy, with the overnight cash rate exceeding 9% by June of 1998. Because the depreciation was due to a substantial, negative terms of trade shock which decreased aggregate demand, the tightening of monetary policy, not surprisingly, led to a severe recession and an undershoot of the inflation target range with actual deflation occurring in 1999.[8] The Reserve Bank of New Zealand did eventually realize its mistake and reversed course, sharply lowering interest rates beginning in July 1998 after the economy had entered a recession, but by then it was too late.

In contrast to New Zealand, Australia did not pass legislation mandating an inflation targeting regime. Instead it eased into a monetary policy regime with the Governor of the Reserve Bank mentioning in a March 1993 speech that achieving an inflation rate of 2 to 3% on average over a couple of years would be a good outcome, with a more formal commitment in September 1994 to an inflation goal (later upgraded to "target") of 2 to 3% "over a run of years" (Fraser, 1994). Also, in contrast to New Zealand, the Australian version of inflation targeting stressed flexibility in all aspects of its operations, from the definition of the target with its "thick point" target to the recognition of its discretion in responding to shocks. Supply shocks are dealt with directly by exclusion of food and energy prices from the targeted price index, while the Reserve Bank has indicated that it will only return inflation gradually to the 2 to 3% level following a shock to the price level. (Stevens and Debelle, 1995). On the other hand, like New Zealand, Australia adopted inflation targeting only after having achieved a substantial disinflation, from an inflation rate near 10% in the mid 1980s to near the 2% level by the early 1990s.

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[8]The terms of trade shock, however, was not the only negative shock the New Zealand economy faced during that period. Its farm sector experienced a severe drought which also hurt the economy. Thus, a mistake in monetary policy was not the only source of the recession. Bad luck played a role too. See Drew and Orr (1999) and Brash (2000).

The more flexible approach to inflation targeting in Australia has been quite successful with inflation near the 2 to 3% target since the inception of the targeting regime. Particularly striking is how well monetary policy performed in response to the East Asian crisis of 1997. Prior to adoption of their inflation targeting regime in 1994, the Reserve Bank of Australia had adopted a policy of allowing the exchange rate to fluctuate without interference, particularly if the source of the exchange rate change was a real shock, like a terms of trade shock. Thus when faced with the devaluation in Thailand in July 1997, the Reserve Bank recognized that it faced a substantial negative terms of trade shock because of the large component of its foreign trade conducted with the Asian region and that it should not fight the depreciation of the Australian dollar that would inevitably result.[9] Thus in contrast to New Zealand, it immediately lowered the overnight cash rate by 50 basis points to 5% and kept it near at this level until the end of 1998, when it was lowered again by another 25 basis points.

Indeed, the adoption of the inflation targeting regime probably helped the Reserve Bank of Australia to be even more aggressive in its easing in response to the East Asian crisis and helps explain why their response was so rapid. The Reserve Bank was able to make clear that easing was exactly what inflation targeting called for in order to prevent an undershooting of the target, so that the easing was unlikely to have an adverse effect on inflation expectations. The outcome of the Reserve Bank's policy actions was extremely favorable. In contrast to New Zealand, real output growth remained strong throughout this period. Furthermore, there were no negative consequences for inflation despite the substantial depreciation of the Australian dollar against the U.S. dollar by close to 20%: inflation remained under control, actually falling during this period to end up slightly under the target range of 2 to 3%.

Given the problems it encountered in 1997 and 1998 as a result of its focus on the exchange rate and the rigidity of its regime relative to Australia's, the Reserve Bank of New Zealand has modified its regime to have more in common with the Australians. It has recognized the problems it had with a too short target horizon and now emphasizes a horizon of six to eight quarters in their discussions of monetary policy.[10] Furthermore, the Policy Target Agreement between the central bank and the government has recently been amended to be more flexible in order to support the longer policy horizon.[11] The Reserve Bank of New Zealand has also recognized the problems with using an MCI as an indicator of monetary policy and

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[9]See McFarlane (1999) and Stevens (1999).

[10]See Sherwin (1999) and Drew and Orr (1999).

[11]See Reserve Bank of New Zealand (2000).

abandoned it in 1999. Now the Reserve Bank operates monetary policy in a more conventional way, using the overnight cash rate as its policy instrument, with far less emphasis on the exchange rate in its monetary policy decisions. Recently, the Reserve Bank has also modified its discussion of the inflation target to put greater emphasis on the midpoint of the target rather than the upper and lower limits of the range.

Canada

As in New Zealand and Australia, Canada adopted inflation targeting only after it had already achieved a substantial deflation, bringing it down from above the 10% level to just over 4% by the end of 1990. As in Australia, inflation targeting was not the result of legislation. However, in contrast to Australia, the inflation target is jointly determined and announced by the government and the central bank. On February 26, 1991, a joint announcement by the Minister of Finance and the Governor of the Bank of Canada established formal inflation targets. The target ranges were 2-4% by the end of 1992, 1.5-3.5% by June 1994 and 1-3% by December 1995. After a new government took office in late 1993, the target range was set at 1-3% from December 1995 until December 1998 and has remained at this level since then.

An important challenge to the success of the inflation target at its inception was the federal government's introduction of a goods and services tax (GST) which was accompanied by increases in other direct taxes by both the federal and provincial governments. Indeed, an important reason why the government advocated the inflation target was its hope that it would moderate public sector wage demands in the face of the indirect tax increases and help keep the effect of these taxes to a one-time increase in the price level rather than a ratcheting up of inflation. In this regard, the adoption of inflation targeting was quite successful, with the upward blip in inflation in 1991 to 5% followed by a decline to a 0% rate in 1995, well below the target range of 1-3%. However, as was the case in New Zealand, this decline was not without cost: unemployment soared to above the 10% level from 1991 until 1994. Since 1995, unemployment has fallen to below 7% and the regime has been successful in keeping inflation within the target range of 1-3%.

Inflation targeting in Canada is quite flexible in practice and is closer to the approach in Australia than it is to that in New Zealand. The Bank of Canada is not directly accountable to the government via formal sanctions if it misses its targets as in New Zealand, but rather like the Reserve Bank of Australia is accountable to the public in general. In addition, the inflation

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targeting regime building in a gradual reduction the of inflation target at its inception, explicitly acknowledging of the long lags between monetary policy and inflation outcomes. It did this by setting the horizon for the first target to be 22 months in the future, and a focus on underlying trend of inflation as well as on the headline CPI inflation. Furthermore, the Bank of Canada has stressed that it is concerned about output fluctuations as well as about inflation. While all inflation-targeting regimes in industrialized countries have put a floor as well as a ceiling on inflation targets, this feature has been more prominent and explicit in the Canadian framework. Gordon Thiessen, the governor of the Bank of Canada since 1993, has emphasized this often in his speeches, as suggested by the following quotation:

> Some people fear that by focusing monetary policy tightly on inflation control, the monetary authorities may be neglecting economic activity and employment. Nothing could be further from the truth. By keeping inflation within a target range, monetary policy acts as a stabilizer for the economy. When weakening demand threatens to pull inflation below the target range, it will be countered by a monetary easing. (Thiessen, 1996, p. 2)

One distinguishing feature of the Canadian framework has been the Bank of Canada's development of the MCI concept and its use as a guide to the conduct of monetary policy. A change in the MCI is defined as the weighted sum of changes in the ninety-day commercial paper interest rate and the trade-weighted exchange rate, with a three-to-one weighting on the interest rate relative to the exchanger rate. The MCI has been used to remind the public (and those inside the Bank) that not only is there an interest rate channel for the transmission of monetary policy, but the exchange rate is also an important channel in small open economies like Canada's and thus must be taken into account when setting interest rates. Although the MCI has been useful in this context, recently the Bank of Canada has been backing away from this concept. Deputy Governor Charles Freedman has recently argued in Freedman (2000) that recent shocks to the exchange rate have had quite different sources than during the period for which the MCI weights were estimated, making the MCI a less reliable guide for the stance of monetary policy.

United Kingdom

After the United Kingdom was forced to leave the European Monetary System after the

speculative attack on the pound in September 1992, the British decided to turn to inflation targets as their nominal anchor instead of the exchange rate. Prior to 1997, the Bank of England did not have statutory authority over monetary policy; it could only make recommendations about monetary policy. Thus it was the Chancellor of the Exchequer who announced an inflation target for the U.K. on October 8, 1992. Three weeks later he "invited" the Governor of the Bank of England to begin producing an *Inflation Report* on a regular quarterly basis which would report on the progress being made in achieving the target; an invitation which the Governor accepted. The inflation target range was set at 1-4% until the next election, Spring 1997 at the latest, with the intent that the inflation rate should settle down to the lower half of the range (below 2.5%). In May 1997 after the new Labour government came into power, it adopted a point target of 2.5% for inflation and gave the Bank of England the power to set interest rates henceforth, granting it a more independent role in monetary policy.

The decision to move to a point target of 2.5%, reflected problems with the 1-4% range that manifested itself in mid-1995. In the May 5 meeting of the Chancellor of the Exchequer and the Governor of the Bank of England, the Chancellor overruled the Governor's advice to raise interest rates even though inflation was in the upper half of the range, and was forecast to rise further by the Bank and ended up exceeding the 2.5% midpoint by over one percentage point. In a speech on June 14 (Clarke, 1995), the Chancellor created some confusion about whether meeting the target meant keeping it below 4% or below the 2.5% target set by him and his predecessor. As in New Zealand, the edges of the target range had taken on a life of their own, making it less likely that monetary policy would focus on the target midpoint. To prevent this from occurring again, the point target of 2.5% was adopted in 1997.

Before the adoption of inflation targets, inflation had already been falling in the U.K. from a peak of 9% at the beginning of 1991 to 4% at the time of adoption. The inflation targeting regime was able to contain inflation after the shock of the British devaluation in September 1992. After a small upward movement in early 1993, inflation continued to fall until by the third quarter of 1994, it was at 2.2%, within the intended range articulated by the Chancellor. Subsequently inflation rose, climbing above the 2.5% level by 1996 but has remained around the 2.5% target since then. Meanwhile growth of the U.K. economy has been strong, causing a reduction in the unemployment rate.

The British inflation targeting regime is similar in flexibility to the Canadian and Australian frameworks. It also has stressed a gradual approach to the long-run inflation goal, a focus on the underlying trend of inflation rather than on the headline CPI inflation, and a commitment to preventing declines in inflation below the target. An unusual feature of the British regime up until 1997 was that control over the setting of the monetary policy instruments

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lay with the government as represented by the Chancellor of the Exchequer instead of with the central bank. One manifestation of this lack of independence to conduct monetary policy of the Bank of England was that it focused on refining its communication with the public so that it could effectively act as the "counterinflationary conscience" for the government. With necessity being the mother of all inventions, the Bank of England set a standard with its quarterly *Inflation Report*, and with the third report in August 1993 was sent to the Treasury only after its contents had been finalized and printed, so that the Treasury would not have the opportunity to edit or suggest changes. This report was designed to bring increased transparency and accountability to monetary policy by providing a measure of performance relative to the inflation target, and by articulating how current economic circumstances and monetary conditions would be likely to affect future inflation. The style of the *Inflation Report* is particularly noteworthy because it departed from the usual, dull-looking, formal reports of central banks to take on the best elements of textbook writing (fancy graphics, use of boxes) in order to better communicate with the public. Because of its success in getting out the central bank's message, the Bank of England's *Inflation Report* has been widely emulated by other inflation targeting countries.

The success of the inflation targeting framework in the United Kingdom, which can be attributed to the Bank of England's focus on transparency and communication, helped lead to the Bank being granted operational independence to set monetary policy instruments on May 6, 1997. On May 6, the new Chancellor of the Exchequer, Gordon Brown, announced that the Bank of England would henceforth have the responsibility for setting both the base interest rate and short-term exchange-rate interventions. Two factors were cited by Chancellor Brown that justified the government's decision: first was the Bank's successful performance over time as measured against an announced clear target; second was the increased accountability that an independent central bank is exposed to under an inflation-targeting framework, making the Bank more responsive to political oversight. The granting of operational independence to the Bank of England occurred because it would now be operating under a monetary policy regime that ensured that monetary policy goals could not diverge from the interests of society for extended periods of time, yet monetary policy was to be insulated from short-run political considerations.

V.
LESSONS FROM THE
INFLATION TARGETING EXPERIENCE

Here we draw lessons from the experience with inflation targeting in industrialized countries which can be grouped under three categories: 1) the success of inflation targeting, 2) transparency and accountability, and 3) the operational design of inflation targeting.

Has Inflation Targeting Been a Success?

The simple answer to this question is generally yes, with some qualifications, We look at how well inflation targeting has done along the following dimensions.

Inflation Targeting Has Been Successful in Controlling Inflation. The performance of inflation targeting regimes has been quite good. Inflation-targeting countries have been able to significantly reduce the inflation rate from what might have been expected given past experience. Bernanke, Laubach, Mishkin and Posen (1999), for example, find that inflation remained lower after inflation targeting than would have been forecast using VARs estimated with data from the period before inflation targeting started. Furthermore, once inflation was reduced to levels consistent with price stability, it has remained low: following disinflations, the inflation rate in targeting countries has not bounced back up during subsequent cyclical expansions of the economy.

Inflation Targeting Weakens the Effects of Inflationary Shocks. As discussed above, after Canada adopted inflation targets in February 1991, the regime was challenged by a new goods and services tax (GST), an adverse supply shock that in earlier periods might have led to a ratcheting up in inflation. Instead the tax increase led to only a one-time increase in the price level; it did not generate second- and third-round rises in wages in prices that would led to a persistent rise in the inflation rate. Another example is the experience of the United Kingdom and Sweden following their departures from the ERM exchange-rate pegs in 1992. In both cases, devaluation would normally have stimulated inflation because of the direct effects on higher export and import prices and the subsequent effects on wage demands and price-setting behavior. Again it seems reasonable to attribute the lack of inflationary response in

these episodes to adoption of inflation targeting, which short-circuited the second- and later-round effects and helped to focus public attention on the temporary nature of the devaluation shocks. Indeed, one reason why inflation targets were adopted in both countries was to achieve exactly this result.

Inflation Targeting Can Promote Growth and Does Not Lead to Increased Output Fluctuations. Although inflation reduction has been associated with below-normal output during disinflationary phases in inflation-targeting regimes, once low inflation levels were achieved, output and employment returned to levels as high as they were previously and output fluctuations are no higher. A conservative conclusion is that once low inflation is achieved, inflation targeting is not harmful to the real economy. Given the strong economic growth after disinflation in many countries that have adopted inflation targeting such as those discussed in the case studies, a case can be made that inflation targeting promotes real economic growth in addition to controlling inflation.

Inflation Targets Do Not Necessarily Reduce the Cost of Reducing Inflation. One of the hopes of the industrialized countries who adopted inflation targets when there was still the need to disinflate was that a commitment by a central bank to reduce and control inflation would improve its credibility and thereby reduce both inflation expectations and the output losses associated with disinflation. Experience and econometric evidence (e.g., see Almeida and Goodhart, 1998, Laubach and Posen, 1997, Bernanke, Laubach, Mishkin and Posen, 1999) does not support this prediction, however. Inflation expectations did not immediately adjust downward following the adoption of inflation targeting. Furthermore, there appears to have been little if any reduction in the output loss associated with disinflation, the sacrifice ratio, among countries adopting inflation targeting. It appears, unfortunately, that there is no free (credibility) lunch from inflation targeting. The only way to achieve disinflation is the hard way: by inducing short-run losses in output and employment in order to achieve the longer-run economic benefits of price stability.

Transparency and Accountability

Transparency and accountability are key features of inflation targeting, leading to the following lessons.

The Key to Success of Inflation Targeting is It's Stress on Transparency and Communication with the Public. A key feature of all inflation targeting regimes is that they put enormous stress on transparency and communication. The *Inflation Report* document published by the Bank of England and its counterpart documents from other inflation-targeting central banks is one example mentioned in the case studies. Inflation-targeting central banks take this communication with the public even further. Officials of the Reserve Bank of New Zealand, particularly the Governor, Don Brash, pride themselves on their extensive speaking schedule (and even glossy brochures) which are used to explain to all walks of society the conduct of monetary policy under the inflation targeting regime. Other inflation-targeting central banks use similar methods. Furthermore, inflation-targeting central banks engage in additional forms of communication which increases transparency including: testimony to national parliaments, release of minutes of the meetings of the monetary policy committees who decide on monetary policy, release of central bank forecasts of inflation and output, and numerous articles in official central bank publications and elsewhere to explain the conduct of monetary policy.

The above channels of communication are used by central banks in inflation-targeting countries to explain the following to the general public, financial market participants and the politicians: 1) the goals and limitations of monetary policy, including the rationale for inflation targets; 2) the numerical values of the inflation targets and how they were determined, 3) how the inflation targets are to be achieved, given current economic conditions; and 4) reasons for any deviations from targets. These communication efforts have been crucial to the success of the inflation targeting regimes. They have improved private-sector planning by reducing uncertainty about monetary policy, interest rates and inflation; they have promoted public debate of monetary policy, in part by educating the public about what a central bank can and cannot achieve; they have increased the central banks' freedom of action, for example by allowing central banks to more readily pursue expansionary monetary policy when faced with negative shocks to the economy without adverse effects on inflation expectations; and they have helped clarify the responsibilities of the central bank and of politicians in the conduct of monetary policy.

Inflation Targeting Increases Accountability Which Helps Ameliorate the Time-Inconsistency Problem. An important consequence of increased communication and transparency is that it promotes accountability of the central bank and thus can help reduce the likelihood that the central bank will fall into the time-inconsistency trap in which it tries to

expand output and employment in the short-run by pursuing overly expansionary monetary policy. But since time-inconsistency is more likely to come from political pressures on the central bank to engage in overly expansionary monetary policy, a key advantage of inflation targeting is that it helps focus the political debate on what a central bank can do in the long-run -- that is, control inflation -- rather than what it cannot do -- raise economic growth and the number of jobs permanently through expansionary monetary policy. Thus inflation targeting has the potential to reduce political pressures on the central bank to pursue inflationary monetary policy and thereby reduce the likelihood of time-inconsistent policymaking.

Indeed, in countries which have adopted inflation targeting, the public debate has shifted from short-run considerations with a focus on "jobs, jobs, jobs", to a longer-run focus on what the long-run inflation goal should be and whether the current setting of monetary policy instruments is appropriate to achieve the stated inflation target. This change in political economy of monetary policymaking in inflation targeting countries is one of the key reasons why central banks have been able to pursue policies that have kept inflation low.

Increased Transparency and Accountability Under Inflation Targeting Helps Promote Central Bank Independence. A key factor behind the success of inflation targeting is that it helps promote independence of central banks, thus enabling them to take a longer-run view and avoid the time-inconsistency pressures from politicians. Sustained success in the conduct of monetary policy, as measured against a well defined benchmark, inflation targets, has been instrumental in building public support for a central bank's independence and policies. We have already seen how inflation targeting in the United Kingdom led to the government's granting it operational independence to conduct monetary policy. Another remarkable example occurred in Canada in 1996, when the president of the Canadian Economic Association made a speech criticizing the Bank of Canada for pursuing monetary policy that he claimed was too contractionary. His speech sparked off a widespread public debate. In countries not pursuing inflation targeting, such debates often degenerate into calls for the immediate expansion of monetary policy with little reference to the long-run consequences of such a policy change. In this case, however, the very existence of inflation targeting channeled the debate into a substantive discussion over what should be the appropriate target for inflation, with both the Bank and its critics obliged to make explicit their assumptions and estimates of the costs and benefits of different levels of inflation. Indeed, the debate and the Bank of Canada's record and responsiveness led to increased support for the Bank of Canada, with the result that criticism of the Bank and its conduct of monetary policy was not a major issue in the

1997 elections as it had been before the 1993 elections.

Accountability to the General Public Seems to Work as Well as Direct Accountability to the Government. The strongest form of accountability of a central bank in an inflation-targeting regime is in New Zealand, where the government has the right to dismiss the Reserve Bank's governor if the inflation targets are breached. As we have seen, in other inflation-targeting countries, the central bank's accountability is less formalized. Still, transparency of policy associated with inflation targeting has tended to make the central bank highly accountable to both the general public and the government, with the benefits outlined above. Indeed, central banks with a less formal approach to accountability, such as Australia, Canada and the United Kingdom, have done as well in controlling inflation as New Zealand with its more formal approach.

Inflation Targeting is Consistent with Democratic Principles. As discussed in Mishkin (1999b), inflation targeting has the virtue of being fully consistent with the role of a central bank in a democratic society. Though a central bank is most effective if it is insulated from short-term political pressures, democratic principles suggest that it be accountable over the longer-term to the political process for achieving goals set by the government. In the terminology of Debelle and Fischer (1994) and Fischer (1994), the central bank would be goal, but not instrument independent. When the goals of monetary policy and the central bank's record for achieving them are laid out clearly as in an inflation targeting regime, it becomes difficult for the central bank to pursue for any extended period of time policies that are inconsistent with the interests of the society at large.

Operational Design of Inflation Targeting

There are several elements of operational design that have important implications for how inflation targeting has worked in practice.

Inflation Targeting is Far From a Rigid Rule. Some economists (e.g. Friedman and Kutner, 1996) have criticized inflation targeting because they believe that it imposes a rigid rule on monetary policymakers that does not allow them enough discretion to respond to unforeseen circumstances. This criticism is one that has featured prominently in the rules-versus-discretion

debate. For example, as we have seen in the case studies on monetary targeting, policymakers in countries that adopted monetary targeting did not foresee the breakdown of the relationship between monetary aggregates and goal variables such as nominal spending or inflation. With rigid adherence to a monetary rule, the breakdown in their relationship could have been disastrous. However, the traditional distinction between rules and discretion can be highly misleading. Useful policy strategies exist that are "rule-like" in that they involve forward-looking behavior that limits policymakers from systematically engaging in policies with undesirable long-run consequences. Such policies avoid the time-inconsistency problem and would best be described as "constrained discretion" (Bernanke and Mishkin, 1997).

Indeed, inflation targeting can be described exactly in this way. As we have seen in the case studies, inflation targeting, as actually practiced, is far from a rigid rule. First, inflation targeting does not provide simple and mechanical instructions as to how the central bank should conduct monetary policy. Rather, inflation targeting requires that the central bank use all available information to determine what are the appropriate policy actions to achieve the inflation target. Unlike simple policy rules, inflation targeting never requires the central bank to ignore information and focus solely on one key variable. Second, inflation targeting as practiced contains a substantial degree of policy discretion. Inflation targets have been modified depending on economic circumstances, as we have seen. Furthermore, central banks under inflation-targeting regimes have left themselves considerable scope to respond to output growth and fluctuations through several devices.

However, despite its flexibility, it is important to recall that inflation targeting is not an exercise in policy discretion as subject to the time-inconsistency problem. The strategy of hitting an inflation target, by its very nature, forces policymakers to be forward looking rather than narrowly focused on current economic conditions. Further, as discussed above, through its transparency, an inflation-targeting regime increases the central bank's accountability, which constrains discretion so that the time-inconsistency problem is ameliorated.

Inflation Targets Have Always Been Above Zero With No Loss of Credibility. All inflation targeters in industrialized countries (and hybrid targeters like Germany or the European Central Bank) have chosen to choose inflation targets well above zero: the midpoint of long-run inflation target ranges is 1% for the European Central Bank, 1.5% for New Zealand, 1.75% for Germany just before EMU, 2% for Canada, Sweden and Finland (and Spain before it joined EMU), and 2.5% for Australia and the United Kingdom. This choice of inflation targets above zero reflects monetary policymakers concerns that too low inflation, or particularly low

inflation, can have substantial negative effects on real economic activity.[12] There are particularly valid reasons for fearing deflation, including the possibility that it might promote financial instability and precipitate a severe economic contraction (see Mishkin, 1991 and 1997). Indeed, deflation has been associated with deep recessions or even depressions, as in the 1930s, and the recent deflation in Japan has been one factor that has weakened the financial system and the economy. Targeting inflation rates of above zero makes periods of deflation less likely.

As long as inflation targets are consistent with Alan Greenspan's definition of price stability, a rate of price increase such that households and business take little account of it in everyday decisions, which I would put between 0 and 3%, there appears to be no loss of credibility for the central bank and inflation targeting regimes. For example, the evidence on inflation expectations from surveys and interest rate levels (Almeida and Goodhart, 1998, Laubach and Posen (1997) and Bernanke, Laubach, Posen and Mishkin, 1999) suggest that maintaining a target for inflation above zero (but not too far above) for an extended period does not lead to instability in inflation expectations.

Inflation Targeting Does Not Ignore Traditional Stabilization Goals. One concern of critics of inflation targeting is that an excessive focus on inflation may result in excessive output fluctuations. The fact that excessive output fluctuations have not occurred results from the fact that inflation targeting central banks cannot be characterized as "inflation nutters", Mervyn King (1996). As outlined in the case studies, central banks in inflation targeting countries do express their concern about output fluctuations in setting monetary policy, and this is reflected in the flexibility of the inflation targeting regimes when there are supply shocks, the gradual convergence of inflation targets to long-run goals (which as demonstrated by Svensson, 1997, indicates a weight on output in central bank objective functions), and emphasis on the floor of inflation targets as a rationale for expansionary policy when there are negative shocks to aggregate demand. A benefit of inflation targeting, as it is practiced, is that it does not eschew stabilization goals, but rather puts them in the appropriate long-run context.

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[12]For example, Akerlof, Dickens and Perry (1996) argue that inflation below 2% can lead to higher unemployment because of downward rigidities in wages. However, as pointed out in Groshen and Schweitzer (1996), Akerlof, Dickens and Perry (1996) do not take into account forces that operate in the opposite direction, that is, that high and variable inflation rates may increase the noise in relative wages, reducing their information content and hence the efficiency of the process by which workers are allocated across occupations and industries. In other words, higher inflation can represent "sand" as well as "grease" in the labor market.

Undershoots of the Inflation Target are as Important as Overshoots. Inflation
targeters, particularly the Bank of Canada, have emphasized that the floor of the target range
should be emphasized every bit as much as the ceiling, thus helping to stabilize the real
economy when there are negative aggregate demand shocks. Indeed, inflation targets can
increase the flexibility of the central bank to respond to declines in aggregate spending because
declines in aggregate demand that cause the inflation rate to undershoot the target range will
automatically stimulate the central bank to loosen monetary policy without fearing that its action
will trigger a rise in inflation expectations. Indeed, this feature of inflation targeting was an
important element which helped the Australians to respond so quickly to the negative shock of
the East Asian crisis of 1997, enabling them to weather the storm better than might have been
expected otherwise. Insufficient focus on undershooting the target would have led to a different
outcome and in general will produce excessive output fluctuations.

Emphasis on preventing undershoots of the inflation target range is also important
because it indicates to the public and the politicians that the central bank is not an "inflation
nutter" and cares about output declines, as they do. The pursuit of price stability implies that
too low inflation is to be avoided as much as too high inflation. Too much focus on preventing
overshoots of the target and not enough emphasis on preventing undershoots can cost a central
bank public support for its policies. Without this support, political pressure is likely to make
it extremely difficult for the central bank to pursue the price stability objective.

Although the European Central Bank (ECB) has acted to prevent deflation (Issing, 2000)
by easing monetary policy in its first year of operation, its initial announcement of the inflation
goal "of less than 2%" did create some confusion. Subsequently it clarified that since inflation
always means an increase in the price level, this goal implies a floor of zero on the inflation rate.
Nonetheless, further clarification that the ECB considers the floor of zero for the range on the
inflation goal to be as important as the 2% ceiling would help its communication with the public
and strengthen support for its policies. Because support for price stability is often more tenuous
in emerging market countries, emphasis on prevention of undershoots of the target is even more
crucial to the success of inflation targeting in these countries.[13]

***When Inflation is Initially High, Inflation Targeting May Have to be Phased in
After Disinflation.*** When inflation is initially high, inflation is not easily controlled by the

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[13]For example, support for the Central Bank of Chile and its inflation targeting regime suffered
substantial erosion after its recent undershoot of its target with little comment from the Chilean central
bank that undershoots of the target also need to be a priority (Mishkin and Savastano, 2000).

monetary authorities. Thus target misses are more likely with an inflation target, and this can lead to a loss of credibility for the central bank. This problem is often even more severe for emerging market countries which have inflation rates well above what has been experienced in industrialized countries. The solution to this dilemma is to phase in inflation targeting only after there has been a successful disinflation. This indeed has been the strategy used by all the industrialized countries discussed here. It has also been used by emerging market countries such as Chile (see Morande and Schmidt-Hebbel, 1997, and Mishkin and Savastano, 2000).

Too Short a Horizon and a Narrow Range Can Lead to Controllability and Instrument Instability Problems. Monetary policy affects the economy and inflation with long lags: for inflation in industrialized countries, the lags are particularly long, estimated to be on the order of two years. Shorter time horizons, embedded in annual inflation targets, have been common in inflation targeting regimes. The use of too short a horizon can lead to a controllability problem: too frequent misses of the inflation target, even when monetary policy is being conducted optimally. As we have seen, in 1995, the Reserve Bank of New Zealand overshot its annual inflation target range, making the governor subject to dismissal under the central bank law even though it was widely recognized that the overshoot was likely to be short-lived and that inflation would soon fall. Luckily, this breach of the target range did not result in a substantial loss of credibility of the Reserve Bank because it was understood that monetary policy had not been overly expansionary. However, in other circumstances, target breaches due to too short a horizon for the inflation target could be damaging to central bank credibility and weaken the effectiveness of the inflation targeting regime.

Too short a horizon can also lead to instrument instability, in which policy instruments are moved around too much in order to achieve the inflation target over the shorter horizon. As we have seen, this problem is likely to be even more severe in a small, open economy, like New Zealand, because exchange rate movements have a faster impact on inflation than interest rates. As a result, attempts to achieve the annual target will induce greater reliance on manipulating exchange rates and can lead to large swings. Indeed, the annual inflation target in New Zealand is one reason why it may have focused more on exchange rates in the conduct of monetary policy, with the negative consequences discussed earlier in the case study.

Trying to hit the short-horizon target can also induce greater output fluctuations. Recall that too short a horizon implies that not enough weight is put on output fluctuations in the central bank's objective function as demonstrated by Svensson (1997). The New Zealand case study also provided an example of excessive output fluctuations stemming from too short a

horizon when the Reserve Bank pursued overly tight monetary policy at the end of 1996 because of fears that inflation would rise above the target range in 1997.

A solution to too short a horizon for the inflation target is to set inflation targets for periods of two years ahead, and indeed as we have seen, New Zealand has moved in this direction. A two-year target automatically implies that the central bank will have multi-year targets, because the target for the current year will have been set two years previously. Only if inflation has been at the long-run price-stability goal will the targets be the same for the current year and the following year. Even in that case, it is important for the central bank to explain to the public that the target set today is for a period two years from now so that there is public support for monetary policy to be appropriately preemptive.

Controllability and instrument instability problems also can arise from too narrow a target range. Estimates of the irreducible uncertainty around an inflation target are on the order of 5 percentage points (e.g., Haldane and Salmon, 1995, and Stevens and Debelle, 1995), although over time success with inflation targeting might decrease the volatility of inflation expectations and hence inflation. To reflect this uncertainty, the inflation targeting central bank could choose a very wide target range. However, it is unlikely to do so because a wide range is likely to confuse the public about the central bank's intentions and reduce the credibility of policy. The result is that central bank have chosen target ranges that are so narrow that misses are likely to be too frequent even with excellent policy.[14] New Zealand's target misses in the early years of its inflation-targeting regime can in part be attributed to a too narrow range of 2 percentage points, and although the New Zealand central bank was initially not a supporter of widening the range to 3 percentage points, this change has been an improvement for their inflation-targeting framework.

Edges of Target Range Can Take on a Life of Their Own. With target ranges in place, politicians, financial markets and the public often focus on whether inflation is just outside or inside the edge of the range, rather than the midpoint. In the New Zealand case, the focus on small breaches of the target range, given the initial narrowness of the range, 2 percentage points, helped lead to instrument instability with excessive fluctuations in monetary policy instruments.

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[14]Misses of the target range in inflation targeting countries have been rare in recent years and so it might be argued that the controllability problem from narrow target ranges is overstated. However, it is important to recognize that industrialized countries may have been extremely lucky in recent years, with supply shocks generally being favorable and demand shocks coming at auspicious time which have helped keep inflation near target levels. Although my mother has always told me, "being lucky is better than being good," it is dangerous to depend on always having good luck. The narrow ranges of inflation targets in many countries may come back to haunt them in future years.

The opposite problem occurred in the United Kingdom in 1995 when inflation exceeded the target midpoint by over one percentage point, but without breaching the ceiling, giving the Chancellor of the Exchequer cover to resist the Bank of England's recommendation for tightening of monetary policy. The problem with a focus on the edges of the range is that it can lead the central bank to concentrate too much on keeping the inflation rate just within the bands rather than trying to hit the midpoint of the range. No sensible objective function for policymakers would justify this kind of behavior.

The disadvantages of a target range -- its leading to an excessive focus on the edges and a tendency for it to be set too narrow -- suggest that a point target for inflation would be superior. However, in order for a point target to be consistent with the necessary flexibility of monetary policy, the central bank needs to communicate with the public the inherent uncertainty in the inflation process and the ability of the central bank to hit the target. This is exactly what the Bank of England does in its *Inflation Report* where it uses the successful device of its "fan chart" in which the confidence intervals around the inflation forecast are displayed with different shadings. The Bank of England is required to report to Parliament when inflation is more than 1 percentage point away from the inflation target, but this requirement is subtly different than a range because it puts the appropriate focus on the point target rather than the edges of the band.

Targeting Asset Prices Like the Exchange Rate Worsens Performance. Central bank's clearly care about the value of the domestic currency as the case studies here indicate. Changes in the exchange rate can have a major impact on inflation, particularly in small, open economies. For example, depreciations lead to a rise in inflation as a result of the pass through from higher import prices and greater demand for exports, particularly in a small, open economy. In addition, the public and politicians pay attention to the exchange rate and this puts pressure on the central bank to alter monetary policy. An appreciation of the domestic currency can make domestic business uncompetitive, while a depreciation is often seen as a signal of failure of the central bank as has recently been the case for the European Central Bank, which has been blamed, I think unfairly, for the euro's decline.

Emerging market countries, quite correctly, have an even greater concern about exchange rate movements. Not only can a real appreciation make domestic industries less competitive,but it can lead to large current account deficits which can make the country more vulnerable to currency crisis if capital inflows turn to outflows. Depreciations in emerging market countries are particularly dangerous because they can trigger a financial crisis along the

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lines suggested in Mishkin (1996, 1999c). These countries have much of their debt denominated in foreign currency and when the currency depreciates, this increases the debt burden of domestic firms increases. Since assets are typically denominated in domestic currency and so do not increase in value, there is a resulting decline in net worth. This deterioration in balance sheets then increases adverse selection and moral hazard problems, which leads to financial instability and a sharp decline in investment and economic activity. This mechanism explains why the currency crises in Mexico in 1994-95 and East Asian in 1997 pushed these countries into full-fledged financial crises which had devastating effects on their economies.

The fact that exchange rate fluctuations are a major concern in so many countries raises the danger that monetary policy, even under an inflation targeting regime, may put too much focus on limiting exchange rate movements. The first problem with a focus on limiting exchange rate movements is that it runs the risk of transforming the exchange rate into a nominal anchor that takes precedence over the inflation target. Although this has not been a problem for the industrialized countries discussed here, it has been a problem for Israel. As part of its inflation targeting regime, Israel has had an intermediate target of an exchange rate band around a crawling peg, whose rate of crawl is set in a forward-looking manner by deriving it from the inflation target for the coming year. Even though the Bank of Israel downplayed the exchange rate target relative to the inflation target over time, it did slow the Bank's efforts to win support for disinflation and lowering of the inflation targets (e.g., see Bernanke, Laubach, Mishkin and Posen, 1999.)

A second problem is that an excessive focus on the exchange rate can induce the wrong policy response when a country is faced with real shocks, as suggested by the experience of New Zealand when it kept monetary policy too tight in the face of the negative terms-of-trade shock in 1997.[15] The correct response to a change in the exchange rate clearly depends on the nature of the shock that produces the exchange rate change. If a depreciation is due to a portfolio shock, then the appropriate response is a tightening of monetary policy, but if the depreciation is due to a negative terms-of-trade shock, then the appropriate response is an easing.

The discussion above therefore suggests that targeting on an exchange rate is likely to worsen the performance of monetary policy, and this conclusion applies equally to targeting on other asset prices. Clearly, setting monetary policy instruments to achieve inflation targets

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[15]Chile also made a similar policy mistake in 1998 because of its focus on limiting exchange rate movements (see Mishkin and Savastano, 2000).

requires factoring in exchange rate and other asset price movements. Changes in exchange rates and other asset prices like those on common stock have important effects on aggregate demand and inflation and are important transmission mechanisms for monetary policy. However, the response to fluctuations in exchange rates and other asset prices cannot be mechanical, because depending on the nature of the shocks driving these asset prices, optimal monetary policy responds in different ways.

The argument above and the negative New Zealand experience suggest that MCI's are probably not a useful concept for guiding monetary policy. The MCI provides information about the stance of monetary policy only for the average type of shocks hitting the exchange rate during the period when it was constructed. If the type of shocks change over time, then the MCI will prove to be a faulty guide. For example, Freedman (2000) suggests that the weights for the Bank of Canada's MCI were estimated over a period in which portfolio shocks dominated movements in the exchange rate. In recent years, it is real shocks that dominate Canadian exchange rate movements and so the weights in the Canadian MCI are now likely to be inappropriate. Furthermore, central banks have a lot of information to help them sort out what type of shocks are affecting the exchange rate. Using this information, a central bank can make a more accurate assessment of how the exchange rate change will affect aggregate demand and inflation on a case by case basis, thereby improving their ability to hit the inflation target and avoid economic downturns.

VI.
CONCLUSIONS

This paper has described the experience in a number of industrialized countries with monetary policy strategies that make use of monetary or inflation targets. The experience with monetary targeting suggests, that although it was successful in controlling inflation in Switzerland and especially Germany, the special conditions in those two countries that made it work reasonably well are unlikely to be satisfied elsewhere. Inflation targeting therefore should lead to better economic performance for countries that choose to have an independent domestic monetary policy. However, for inflation targeting to be successful, we need to learn the lessons from past experience. The lessons from the industrialized countries experience outlined in this paper, hopefully, can help guide central banks to achieve better design of their monetary policy framework.

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