Shifting Nominal Anchors: The Experience of Mexico

Leonardo Leiderman, Nissan Liviatan and Alfredo Thorne

Abstract: In the mid-1980's Mexico successfully brought down its high rate of inflation by using the exchange rate as nominal anchor in combination with strict fiscal discipline, tight monetary policy, and incomes policy. This paper discusses the role of exchange rate policy as nominal anchor in Mexico and develops the inflation target as the monetary framework for anchoring prices. It also describes how Mexico is applying this framework while shifting to a more flexible exchange regime and discusses the role of the newly independent central bank and monetary policy in keeping inflation under control while shifting nominal anchors. This paper describes the situations as seen in early 1994, and makes no attempt to describe the events that led to the 1994 crisis and its aftermath.

Resumen: A mediados de los años ochenta, México logró bajar sus altas tasas de inflación utilizando el tipo de cambio como ancla nominal combinándola con una estricta disciplina fiscal, política monetaria restrictiva y política de ingresos. Este trabajo estudia el desempeño de dicha política y analiza la meta inflacionaria como estrategia monetaria para anclar los precios. Se explica cómo en México se utiliza este marco de trabajo al tiempo que se cambia a un régimen de tipo de cambio más flexible. Se discute también el papel que el Banco Central y la política monetaria tienen para mantener la inflación bajo control en el momento en que se están cambiando las anclas nominales de la economía. Este trabajo describe las situaciones tal y como se percibían a principios de 1994 y no las causas que originaron la crisis de ese año y sus repercusiones.

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In the mid-1980s Chile, Israel and Mexico successfully brought down their high rates of inflation by using the exchange rate (ER) as a nominal anchor in combination with strict fiscal discipline, tight monetary policy, and incomes policy.[1] Initially, to stabilize inflationary expectations and to assure the gradual reduction of the domestic rate of inflation, policy-makers fixed the nominal exchange rate below market expectations and balanced the fiscal accounts. In a second stage, to avoid excessive real appreciation of the exchange rate resulting from domestic prices increasing faster than international ones and to assure the sustainability of the economic adjustment, the authorities shifted first from a fixed nominal exchange rate to a crawling peg regime, and second, to an exchange rate band.

The shift to greater exchange rate flexibility combined with tight fiscal and monetary policy enabled the three countries to gain credibility in the economic adjustment and to sustain the fall in the rate of domestic inflation. Yet, the use of the exchange rate to anchor domestic prices led market participants to form future price expectations based on exchange rate fluctuations; and this close link between exchange rate fluctuations and price expectations prevented policy-makers from using the exchange rate to absorb external and domestic shocks. The three countries offer examples of two opposing problems regarding this link. On the one hand there is Chile that opted for a real exchange rate target.[2] To encourage the growth in exports and to sustain economic growth, the Chilean authorities opted for targeting the real exchange rate. To this end, the authorities decided to realign every month the central parity of the exchange rate band with the differential between domestic and international price increases. By targeting the real exchange rate the authorities indexed future price inflation to past inflation, thus limiting the progress in lowering the domestic inflation rate. Chile brought the domestic inflation rate down from over 1 000 percent in the mid-1970s to about 15 percent in the 1990, but the inflation rate refused to fall below 10 percent.

On the other hand there is Mexico that opted for lowering the domestic inflation rate to single digits.[3] The emphasis on bringing the domestic inflation rate to international levels and the concern with

[1] See Helpman, Leiderman and Bufman (1993) for a comparative discussion on these countries' experience with exchange rate policy and bands.

[2] See R. Vergara (1994) for a discussion of exchange rate policy in Chile.

[3] See Banco de México (1994b) for a discussion of exchange rate and monetary policy.

the close link between exchange rate fluctuations and domestic price expectations led the central bank to limit excessive exchange rate fluctuations. Until late-1993 the central bank used an inner-intervention band to limit exchange rate fluctuations, and in 1994 the central bank intervened heavily to keep the exchange rate within the exchange rate band agreed in the social pact between the government, the workers and entrepreneurs. In contrast with Chile, Mexico made substantial progress in lowering the domestic inflation rate-reaching 7 percent in 1994. But the emphasis on inflation —in combination with strong stabilization and capital inflows— led to the real appreciation of the exchange rate and to high real interest rates, which may have weakened the economic recovery. The use of the exchange rate to stabilize price expectations and the faster increase in domestic prices relative to international ones in combination with the strong capital inflows, led to the appreciation of the real exchange rate; and the central bank interventions to defend the exchange rate within the band, led to the high real interest rates.

Countries, such as Chile, Israel and Mexico, that have been successful in controlling inflationary expectations using the exchange rate as the nominal anchor confront the problem of how to de-link exchange rate fluctuations from future price expectations. That is, how to shift from an exchange rate to an inflation target as the nominal anchor while continuing to make progress in reducing the domestic inflation rate. It is often argued that a sudden shift to an inflation target could lead to greater exchange rate fluctuation and because price expectations are linked to exchange rate fluctuations, inflationary expectations would result. Therefore, a key policy question for these countries is: how to de-link future price expectations from exchange rate fluctuations, in other words, how to shift nominal anchors? This question is particularly relevant for countries exposed to external and internal shocks, and thus requiring greater exchange rate flexibility.[4]

The paper analyzes the transitional problems of shifting nominal anchors and offers a framework for using inflation targets to anchor nominal prices. To illustrate the problems of policy coordination in transition we took the case of Mexico before the 1994 crisis which was in the process of shifting nominal anchors and had announced its de-

[4] Countries less exposed to shocks, or that have flexible labor markets can opt for a fixed exchange rate and absorb shocks through changes in the current account /or changes in the real wage, or both.

cision to shift to an inflation target.[5] Mexico is a good example of a complex transition to low inflation: it combines the commitment by an independent central bank to adopt an inflation target framework for anchoring prices, with the commitment to an exchange rate band in the context of a social pact which *de-facto* links exchange rate changes to nominal wage increases.

The paper is organized in three sections. Section A discusses the role of exchange rate policy as a nominal anchor in Mexico. Section B develops the inflation target as the monetary framework for anchoring prices and explains how Mexico is applying this framework while shifting to a more flexible exchange rate regime. It discusses the role of the newly independent central bank and monetary policy in keeping inflation under control while shifting nominal anchors. Section C analyzes the international evidence and reviews the monetary framework that developed countries use to keep inflation under control.

Although Mexico fell into the December 1994 crisis in the process of shifting nominal anchors, its causes and the role of the exchange rate and monetary policies are not explicitly addressed in this paper. These problems are addressed in a comparison paper where we argue that the commitment to the nominal exchange rate anchor and the delay in shifting nominal anchors played a key role in explaining the crisis.[6] This paper was prepared before the crisis took place as an attempt to lay out a framework for shifting nominal anchors and design a policy framework that would enable the authorities to confront the domestic and external shocks that took place in 1994. Because the discussion and the framework offered can be useful to countries that are in the process of shifting nominal anchors, we decided to leave the paper as it was originally written. It is important, however, to note that the paper describes the situations as seen in early 1994 and makes no attempt to describe the events that led to the 1994 crisis and its aftermath.

[5] See Banco de México (1994a).
[6] See Leiderman and Thorne (1995).

A. The Role of Exchange Rate as a Nominal Anchor

In this section we examine the role of exchange rate policy in the Mexican anti-inflation program as seen in early 1994 when Mexico was shifting nominal anchors. We start by discussing the choice of exchange rate regime in the transition to low inflation; we then examine the role played by exchange rate policy in containing inflationary expectations and in gaining credibility; we then follow by considering the need to shift nominal anchors; and finally we examine the role of wage policy when shifting nominal anchors.[7]

Choosing the Exchange Rate Regime

In deciding the exchange rate regime, policy-makers should distinguish between long-term and transitional considerations. The following explains why Mexico might have decided for greater exchange rate flexibility in the transition to low inflation and why in the long term different considerations might argue for a narrower band or a fixed exchange rate system.

Long-term Considerations

Although in the 1990s Mexico chose greater ER flexibility, in the long term Mexico might consider anchoring the Mexican peso on the US dollar by introducing a currency board or agreeing on a monetary union with other NAFTA countries. Indeed, starting in the mid-fifties and for two decades, Mexico had a very favorable experience with a fixed ER regime.

In the long run, assuming labor mobility between Mexico and the U.S., and the political possibility of a monetary union, optimal currency area considerations might favor a fairly narrow ER band anchored on the US dollar and in the context of a monetary union. However, this monetary union would need budgetary resources to cushion the adjustment of individual countries experiencing adverse terms of trade or financial shocks, such as is done in the case of the European Mone-

[7] See Schwartz (1994) for an informative description of Mexico's exchange rate policy since 1987.

tary System. This long-term view cannot be ignored in the case of Mexico. Greater financial integration and greater capital mobility under NAFTA might enable Mexico to reduce the costly short-term adjustments resulting from sudden variations in the ER, and enable consumption and production smoothing over time via the trade balance.

Joining a monetary union has macroeconomic advantages for a country which has a less stable monetary system than the country which it pegs its currency against, which seems to be relevant for Mexico. A narrow ER band might enable Mexico to import the financial stability of the U.S. If the partner is also a large economy like the U.S., which supplies a large share of the country's imports, then pegging the Mexican peso to the US dollar would provide a strong anchor for the domestic price level. One should finally mention that a narrow ER band might have the advantage of reducing transaction costs with a major trading partner such as the United States.

Among the disadvantages of a fixed ER regime, one may mention the slow adjustment of the real ER to structural changes which take place as a result of domestic reforms or permanent external shocks. In the presence of downwardly rigid nominal wage contracts, the adjustment of the real ER will be spread over a longer time than under a fixed ER regime. It is presumably for this reason that Mexico has opted in the short run for some degree of flexibility in the ER. In the long run, and under the stated assumptions, a reasonable regime might be a narrow ER band rather than a fixed ER, since this reflects a commitment of not allowing systematic deviations from U.S. inflation and provides for occasional flexibility.

Transitional Considerations

From the point of view of the transition to low inflation, Mexico's decision in November 1991 to adopt an ER band and in October 1992 to have greater ER flexibility was important for two reasons. First, in spite of its successful stabilization program, Mexico did not eliminate its inflation differential with the U.S. In this situation confining the ER to a narrow band would have entailed further real appreciation in the transition, which could have raised devaluation expectations and put a heavy burden on the stabilization effort. Continued use of the ER as a nominal anchor at the cost of further real appreciation would also have signaled a distorted relative price with important consequences in terms of production. Second, the peso appreciation in real terms could not have been corrected through a *maxi devaluation* (followed by fixing the ER), or a step devaluation because it would have undermined the credibility in the disinflation program.

Two other considerations were relevant for the transition to low inflation in Mexico. As long as full credibility in price stability has not been fully established, there may have been occasional significant misalignments of other nominal variables such as wages or prices in anticipation of a relaxation of ER policy. These would have required some compromise in the form of a more flexible ER policy for a limited time. In addition, as we mentioned earlier, one may expect important structural changes in the economy as part of the adjustments to NAFTA, which will be concentrated in the next few years, and require frequent, and possibly large, variations of the real ER. Because of these considerations, it will be advantageous to have greater flexibility in the ER regime in the transition to economic integration in the framework of NAFTA. This implies that ER flexibility in the medium run, which in 1994 may have been reflected in the width of the ER band, will have to be greater than in the long run.

Stages in Mexico's ER Policy

In Mexico the use of the ER as a nominal anchor in the disinflation program went through two stages. In the first stage, which lasted approximately until November 1991 when the ER band was introduced, the uncertainty about the prospects of the program and on the persistence with the fiscal adjustment was great, which led to inflationary expectations in excess of the governments targets. When the ER was used as an anchor, the policy-makers set the rate of devaluation below the public's expectations in a way which was consistent with the disinflation target. This led to a "credibility battle" which entailed the cost of real appreciation and possible balance of payment crises. This was also the experience of the Chilean Tablita in the late-1970s. Similar, though much milder, developments took place in Israel during the stabilization program.[8]

In the second stage, after the program had accumulated some

[8] See Kiguel and Liviatan (1990) for a discussion of the experience of Latin American countries in the 1960s and 1970s.

credibility, which in Mexico started in November 1991, the ER ceased to be involved in an active credibility struggle; it was used more as a means of preventing a derailment of inflation by various shocks. In this stage, the persistence of the government with fiscal discipline and reforms became the main indicator of the commitment to disinflation, with the nominal anchor playing a secondary role. Indeed, in a stable economy, people do not usually know what the nominal anchor is; they only know that when the need arises, the government will implement the appropriate nominal policy instrument. The experience of Israel and Chile suggests that in this stage inflation will continue to come down gradually through persistence with fiscal austerity and reforms without actively engaging in a credibility battle in the area of nominal anchors. It is in the second stage that a reversal of the real appreciation, accumulated in the first stage, could be redressed by taking advantage of the fall in inflation.

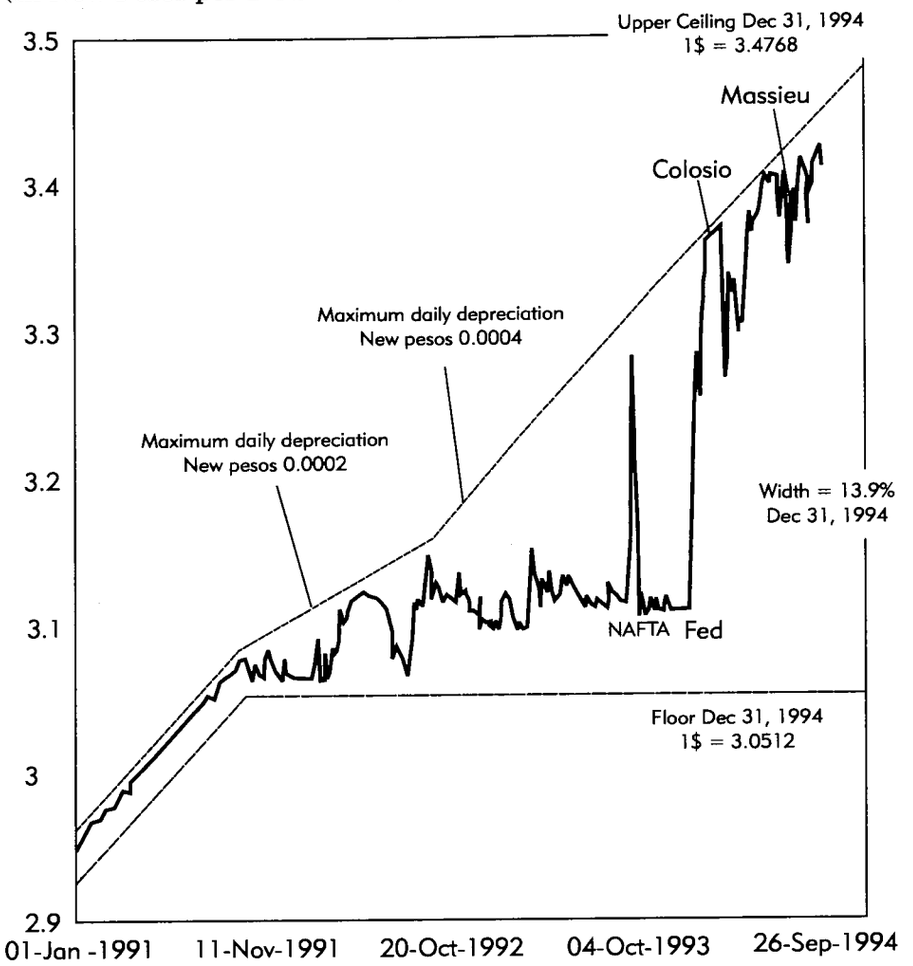
These considerations had an important influence on the parameters of the ER band, which are the width and the rate of crawl (slope) of the band. In stage one, the band was narrow because a wide band could have been interpreted as a way to create devaluation shocks. Given that credibility in the program was low, the public's expectations of devaluation exceeded the crawl of the band and any reduction in the rate of crawl would have increased the gap between the actual and expected rates of devaluation, thus increasing the cost of the credibility battle. Although during the first stage the gap between the actual and the expected devaluation increased, the narrow band helped stabilize inflationary expectations by reassuring market participants against a surprise devaluation shock. The situation was quite different in the second stage. The reduced risk that the government would create a surprise devaluation made it possible to widen the band without the fear that it would raise inflationary expectations, these were also the experiences of Chile and Israel. In Mexico, this was evidenced in 1992 and 1993 when the crawl of the upper band was increased from 20 to 40 centavos a day and the rate of inflation continued to fall, from 12 percent in 1992 to 8 percent in 1993. The wider band also provided the required flexibility for adjusting the real ER in response to the structural reforms and the external shocks that took place in early 1994. In addition, the wider ER band enabled the ER to respond to changes in expected inflation. The band can also be widened by a discreet jump without causing a jump in expectations.

In Mexico the ER policy until 1994 followed, broadly speaking, the description of stage one up to the renewal of the *Pacto* in November 1991. Before this date, the rate of crawl of the ceiling of the band —determined by the social pacts— was gradually reduced ahead of expectations and the band itself was narrow, with the lower bound of the band remaining constant. This led to a continued real appreciation accompanied by other symptoms of misalignment characteristic of the Chilean Tablita-type of policies.

In line with the objectives of the second stage, the change of policy in November 1991 consisted of introducing an ER Band and in October 1992 of widening the ER band by doubling the rate of crawl to 40 centavos per day (that is, 4.6 percent annually) with the floor remaining fixed (see Figure 1). The change in policy was intended to allow greater ER flexibility. Yet, until December 1993 and as a result of the inner-intervention band, the ER remained practically constant except for a temporary jump following a short-lived speculative attack on the peso prior to the ratification of the NAFTA agreement in November 1993. The lack of movement of the ER within the band can be explained by the strong inflows from abroad and by the use of an inner-intervention band. Although the capital inflows could have been dealt with by limiting the appreciation of the exchange rate and allowing a decline in nominal interest rates, nominal interest rates remained relatively high. Thus, the tendency towards a fixed ER continued in practice in spite of the widening of the band.

An obvious motivation for the inner-intervention band was the preference for the disinflation target and the expectation of strong inflows of capital as a result of NAFTA approval. In retrospect, one may argue that the progress on disinflation was made at the expense of greater recessionary pressures in 1993. We may also speculate that the preference for a low inflation and stable currency policy was related to the motivation of minimizing the foreign investors' uncertainties in a year loaded with political and economic uncertainties associated with the election year and the ratification of the NAFTA agreement. This interpretation was confirmed in late 1993 when NAFTA was approved by the US Congress, President Carlos Salinas de Gortari announced the presidential candidate, and the central bank abandoned the inner-intervention band. The abandoning of the inner-intervention band led to greater exchange rate fluctuations within the wider band in response to the new sources of uncertainty that developed, such as the assassination of Luis Donaldo Colosio in

Figure 1. Mexico's Exchange Rate Band
(In New Pesos per 1 US Dollar)



March 1994, and the increase in U.S. short term interest rates starting in February 1994.

The rationale for widening the ER band through the acceleration of the crawl of the ceiling (reaffirmed in the September 1994 social pact), was viewed as laying out the foundation for a more flexible ER regime in the future. It could also have been regarded as the creation of a cushion for handling shocks without violating the basic commitment to the ER rule. This interpretation is suggested by the temporary

jump in the ER following the speculative attack in November of 1993 and again in February 1994. This regime may have an advantage over a conventional fixed ER if the shocks are sufficiently large; but it is still a fixed ER regime from the point of view of disinflation. The important question in early 1994, was whether the time had arrived for the implementation of a more flexible regime at the current state of the disinflation process.

Shifting Nominal Anchors

According to the view described earlier, inflation in stage two comes down gradually as a result of persistence with the right fiscal policies and reforms without any need to drag it down by tighter ER policy. An attempt to force inflation down by fixing the ER will result in real appreciation and thus recession but will have little effect on longer term inflationary expectations since the public knows that such an ER policy is costly and ultimately may be nonviable.

There was a case, however, for modifying the ER policy and gradually shifting to an inflation target as the nominal anchor. To this end, the authorities could have let the band crawl at the differential between the *expected* domestic and international annual rate of inflation when the latter was unforced by ER policy. In this framework, as will be explained in Section B, the expected domestic inflation rate would be the central bank's main monetary policy target. The objective of modifying the ER policy in this way would have been to gradually shift from using the nominal exchange rate as the nominal anchor to using the monetary policy as the nominal anchor. This should have the additional advantage of limiting the real appreciation of the real exchange rate.

The Role of Wage Policy during the Transition

The inflationary regime is characterized by attempts to erode, or to control, real wages by devaluations, and by preemptive wage hikes by labor unions. To avoid this spiral, it is common to find in many stabilization programs an effort to reach a social pact which restrains the government and the unions in their one-sided policies. We can view the pacts in the Israeli and Mexican stabilization in this light. The

price controls (and the business sector) enter into the picture because labor cannot risk a freeze of wages when the employers are free to continue raising prices in the inflationary tradition (say because of lack of credibility in the program); this fear may be justified since in the short run nominal wages and the ER are not sufficient to anchor prices.

As the disinflation program gains more credibility, prices can be liberalized but labor will still require the assurance of an ER anchor in order to restrain wage demands and adjust the structure of contracts (for example, the indexation clause) to a non-inflationary environment. We noted earlier that when the public becomes more convinced of the government's commitment to price stability the significance of an active nominal anchor, for the purpose of disinflation, diminishes. Therefore, the need for coordination between the government's ER policy and the unions' wage objectives is reduced considerably. Given that efforts to secure coordination with labor limits the flexibility of the ER policy (and involve usually a fiscal cost) it is advisable, as a longer term policy to loosen the coordination in these areas. Indeed, this has been the process in Israel and in Mexico since October 1993, when policymakers started emphasizing bilateral wage negotiations between workers and employers, and using productivity growth and future inflation to adjust minimum nominal wages.

But as long as inflation does not come down to international levels there is a danger that nominal wage increases can get out of line. Therefore, in the transition to an inflation target as a nominal anchor some agreement with labor that the nature of wage contracts is essential to rule out serious cost pushes. Labor unions need an assurance that the price level will not deviate from its normal position and not lead to an erosion of real wages. At the current level of credibility in disinflation, the present exchange rate band, or some close variant of it, provides a reasonable assurance. Therefore, the coordination of exchange rate and wage policy through the *Pacto* is still necessary. As the confidence in price stability increases further, the workers will be convinced of the government's commitment to price stability even without any announcement of an exchange rate band. This is the time when the formal connection between exchange rate policy and wage contracts should be discontinued, as far as government intervention is concerned.

B. Shifting to an Inflation Target

In this section we explain how Mexico could have used the inflation target as the monetary framework to anchor prices and to consolidate the low inflation success; in particular, we explain how to reconcile the greater exchange rate flexibility with the objective of low inflation. Since our objective is to explain how the inflation target framework works, we combine some of the policies undertaken by Mexico with the experience of other developed countries. First, we discuss the role of the independent central bank and second, the role of monetary policy.

The Role of the Independent Central Bank

Like in Canada, New Zealand and in other developed countries, in Mexico on January 1, 1994, the Mexican Parliament enacted the Central Bank Law giving the central bank full independence and making price stability its key mandate.[9] This clear-cut mandate compels the central bank to concentrate its efforts and resources in the fight against inflation. The clear mandate makes the central bank accountable for inflation performance. The key task of the new independent central bank was to translate the price stability mandate into actual progress in the fight against inflation. To reassure market participants that shifting nominal anchors will not lead to higher inflation, the objective of the independent central bank was to consolidate the low inflation success. In this regard there are important lessons to be learned from other modern central banks.

A key task of the new independent central bank is to *gain the credibility of market participants.* Because inflation performance responds to subjective factors such as market participants' expectations as much as to objective factors such as economic fundamentals, becoming a credible institution in the fight against inflation is a crucial task for the central bank. Full credibility would be attained when market participants use the central bank inflation targets in forming expectations of future prices, thus making the central bank's monetary policy the true nominal anchor of the system.

To enhance its credibility, the central bank objectives should be

[9] See Congreso de los Estados Unidos Mexicanos (1993) and Banco de México (1994a).

a) to set attainable inflation targets, *b)* to become the watchdog in the fight against inflation, and to ensure support of the government.

Setting Attainable Inflation Targets

The key objective in setting long-term inflation targets is to prove to the market that the central bank is committed to these targets. Credibility will be gained gradually as the central bank shows the market that it is meeting these targets. This commitment demands great responsibility in determining the inflation targets. A key objective in proving the central bank's commitment to inflation targets is to encourage market participants to use the inflation forecasts of the central bank to form price expectations. By accomplishing this objective the central bank would, in fact, make monetary policy the true nominal anchor.

Setting inflation targets that are unattainable might jeopardize the central bank' s fight against inflation in several ways. First, it could lead to greater uncertainty and speculation in the financial markets. A high level of uncertainty would, in turn, lead market participants to expect higher inflation than that announced by the central bank and thus prevent the central bank from meeting its target. Second, it could lead to tighter monetary policy in an effort by the central bank to signal its commitment to the announced targets. Since this could lead to an appreciation of the real exchange rate, to high real interest rates, and possibly to an economic recession, the central bank could attract great criticism from the public, thus eroding its support in the fight against inflation.

Because of Mexico's success in bringing down inflation in 1994, there was no need to try to force a sharp fall in the inflation rate by being commited to overoptimistic inflation targets. The inflation rate was coming down as a result of the recent economic policies and, in particular, as a result of tight fiscal policy. The objective of the government and the central bank is to ensure that the inflation rate continues to fall by showing market participants their commitment to the tight fiscal policy. In this regard the role of the central bank would be to set *realistic* inflation targets and to gain credibility in the fight against inflation.

Becoming the Watchdog in the Fight Against Inflation

The central bank should perform the watchdog role because while it has the price stability mandate, by itself the central bank cannot control inflation. To fulfill the price stability mandate the central bank needs the support of the rest of the public sector. The central bank can perform this role by exercising its independence and by gathering information regarding inflation developments. Compared to other market participants, the central bank has an advantage in gathering and in processing information regarding inflation performance. Moreover, through statistical analysis it is able to identify factors outside central bank control that might undermine the fight against inflation.

The central bank can perform the watchdog role and gain market participants' trust by exercising its independence and promptly informing the market of developments that might lead to inflationary pressures. Inflationary pressures could result from domestic expenditure shocks such as unfounded expectations of an increase in permanent income that might lead to a consumption or investment boom. More importantly, inflationary pressures could result from unforeseen changes in public sector finances that lead to a higher public sector deficit. The central bank should announce these developments with the aim of getting public support for adopting corrective economic and fiscal measures which are outside its control.

Ensuring the Support of the Government

Controlling inflation is a complex task and one that cannot rely exclusively upon the central bank. Unfortunately, the central bank has direct control only of monetary policy, which can only affect the inflation rate in the long term. Experience indicates that there are long and uncertain lags in the response of inflation to monetary policy.[10] To be effective, the central bank needs the support of the government and therefore it is necessary that market participants realize that government support is permanent. In particular, the central bank requires the support of fiscal policy in the fight against inflation and the commitment of the government to a tight fiscal policy. In addition, it requires support in

[10] See Duguay and Poloz (1990).

terms of setting public utility prices and increases in indirect tax rates, since these could lead the central bank to fail to meet inflation targets. One possible way to signal this support to the market is for the central bank and the Treasury to jointly announce inflation targets. This should signal the government's willingness to support the central bank's monetary policy with consistent fiscal policies in the fight against inflation. The joint announcement, for instance, could take place annually when the government announces the renewal of the social pact and the exchange rate band parameters.

The Role of Monetary Policy

To guide both the design of policy and the expectations of market participants in the process of shifting nominal anchors, a clear and transparent definition of monetary policy's objectives and strategy is therefore needed. This section outlines a set of basic principles for anchoring prices using monetary policy. It raises issues such as the choice of goals, intermediate targets, indicators, and instruments of monetary policy. The framework discussed in this section blends basic elements of current monetary policy as followed by the central banks of Canada, Israel, New Zealand, and the United Kingdom. We will attempt here to draw on useful lessons from these experiences to apply them to countries like Mexico that are in the process of shifting nominal anchors.

The Inflation Targets Framework

A broadly known conceptual framework for the design of monetary policy makes a distinction between goals, intermediate targets, indicators, and instruments. The *goals* of monetary policy are the *ultimate objectives* of such policy and they can be regarded as long-term objectives. Leading examples are price stability and full employment. It is typically the case that the central bank has little direct control over the variables identified as goals of monetary policy. In fact, there are long and uncertain lags in the response of these variables to changes in monetary policy. Moreover, there are substantial delays in obtaining

reliable information about the path of these variables. Thus, in real time central bank staff have no other choice but to rely on assessments of the underlying trends and developments in the variables that serve as ultimate objectives of policy.

Next are the *intermediate targets* of monetary policy which can be regarded as short-term objectives. These could be useful in achieving the ultimate objectives because the variables that are commonly chosen to be intermediate targets are more controllable and more frequently observed than the goals, and they are correlated with the goals. The specifics of intermediate targets could be formally announced, say once every six months, or they could be treated as informal guidelines within the central bank. Some central banks use monetary aggregates, exchange rates, and nominal income as formal or informal intermediate targets. Under a fixed exchange rate regime, or when an exchange rate band operates, the exchange rate becomes an intermediate target of monetary policy.

Indicators, or *information variables,* are variables that provide the central bank with information about the stance of monetary policy and the state of the economy. When new information arrives in the form of indicators, it usually leads to a reassessment of the extent to which monetary policy has to be changed to ensure the achievement of its ultimate objectives. Depending on the specifics of the monetary policy framework, a variable may be an intermediate target or an indicator. Leading examples of indicators are the slope of the yield curve, the government budget deficit, forward foreign exchange rates, the output gap, foreign exchange reserves, the level of credit, wages, and measures of inflation expectations. When fixed, the exchange rate is an intermediate target; yet when floating it could serve as an indicator.

Last, *instruments* are those variables under the direct control of the central bank that are used to implement monetary policy. While most central banks use short-term interest rates as their instrument, such as the interest rate at which they lend cash to private banks others employ the monetary base (or a component of the base such as nonborrowed reserves) as their instrument. Once a variable is chosen as the instrument for monetary policy, it is important to specify the rules that will guide the day-to-day adjustments in this variable in response to changing conditions. One such rule, which is commonly observed, is that the central bank raises short-term interest rates (and/or reduces the rate of growth of the monetary base) when there

is sufficient evidence that the rate of inflation is tending to exceed the rate specified as an ultimate objective.[11]

Making the Framework Operational to Mexico

This section makes the monetary policy framework operational to Mexico in early 1994. First we explain the role of explicit inflation targets; and second, we explain the role of intermediate targets and indicators

Explicit Inflation Targets. More and more central banks have selected price stability as their ultimate objective. Research and accumulated experience indicate that monetary policy has a systematic impact on nominal variables such as the price level. Preserving the value of money is certainly within the scope of monetary action and it is the best contribution, from a medium or long-term perspective, that monetary policy can bring about economic growth and welfare. There is no clear evidence that explicit price-stability goals alone have resulted in lower rates of growth or higher rates of unemployment. And the post-war experience in various countries suggests that an explicit full employment goal for monetary policy may lead to a high and variable rate of inflation, without ensuring the achievement of such goal.

To be effective, a price-stability goal has to be defined in a precise and transparent manner. Precision and transparency can increase the credibility of monetary policy and can strengthen its impact on inflation expectations. They also make it possible to assess in real time the extent to which the current conduct of monetary policy is consistent with achievement of the specified goal.

In the Mexican context (as in Chile or Israel), there is still a long way to go to achieve price stability per se.[12] Hence, a low inflation goal

[11] In using short term interest rates to bring down inflation, central banks presume that short term interest rates have a direct effect on aggregate nominal demand. However, under certain conditions, for example, when the increase in short-term interest rates have a direct effect on aggregate supply and monopolistic conditions prevail, an increase in interest rates could signal an increase in the expected inflation rate.

[12] There is however some discussion of what the price stability objective really means. Some have argued against making a zero rate inflation the price stability goal since it might be undesirable to eliminate inflation altogether on economic efficiency grounds; and moreover it might be desirable to have some inflation and negative real interest rates for short-term and riskless securities, see Summers (1991). The Bank of Canada, for instance, has defined the price stability goal as a 2 percent rate of inflation.

can play the same role that price stability plays as the ultimate policy objective in industrial countries. The specification and announcement of *explicit inflation targets* have proven to be a useful and meaningful way for the central bank to make its commitment precise and transparent. This route for monetary policy was formally chosen by several countries such as Britain, Canada, Finland, Israel, New Zealand, and Sweden.[13] The experience of these countries illustrates that *inflation targets can be extremely effective in the process of disinflation,* especially by providing an anchor to inflation expectations precisely at a time when the role of the exchange rate as an anchor is diminished. Inflation targets could be based on the consumer price index or any other well-known price index. They can be specified as a given figure (say, 5 percent inflation) or as a range (say, inflation rates between 4 and 7 percent). Moreover, the time horizons could vary. Some central banks announce inflation targets for the next few years; others limit their target to the current or next year.

The mere announcement of an inflation target does not guarantee a low inflation outcome. Ultimately, whether or not explicit inflation targets contribute to the achievement of the ultimate goal of monetary policy depends on the extent to which the central bank is allowed, and is willing, to adjust its instruments so as to ensure that the goal is met, in spite of major political and interest group pressures. Another factor is whether or not the central bank Board of Governors and management are accountable if the goal is not met. These are the factors that will determine the degree of credibility of the inflation target in the eyes of the public. When an inflation target was first announced in Israel for 1992, it was not regarded as highly credible. However, credibility was gained after some time and after the actions by the authorities made transparent their commitment to the target. Nowadays, most financial managers in the private sector use the official inflation target as their own forecast of inflation.

Although the Mexican authorities announced inflation targets in recent years, the targets were more a form of *price-increase guidelines* in the context of the *Pacto*, than the main operational goal of monetary policy. The target inflation was 9.7 percent for 1992; inflation ended up higher than this target for the year, *i.e.*, 11.9 percent. For 1993, the authorities announced a target rate of inflation of 7 percent and actual

[13] See Freedman (1993) on the case of Canada, and Crockett (1993) on the United Kingdom.

inflation ended up being 8 percent; and for 1994 the authorities announced a target of 4 percent and actual inflation was 7 percent. Despite the minor deviation from target, the achievement of a single-digit rate of inflation after a long time was regarded as a remarkable event. The inflation target for 1995 has been set at 42 percent quite an ambitious figure.[14]

In our view, it is important to make the inflation target the key element in the design of monetary policy and nominal macro policy. Such a target should reflect the consensus, and commitment, of the Treasury and the central bank, and should be openly announced at the time of renewal of the *Pacto*, or at the time of submitting the Budget to Congress. In implementing the inflation target it would be well to follow the next basic rules:

- To specify the target in the form of a range of inflation rates —say between 4 and 7 percent— rather than as a fixed single figure.[15] The specific range that is chosen should be consistent with the behavior of fundamentals, including external variables. In an open economy such as Mexico, there are various internal and external forces affecting inflation whose path may be difficult to assess in real time. Hence, it would be appropriate to incorporate this uncertainty into the formulation of the target;
- To provide the public with a clear statement of the predicted multi-year path for the target. For instance, this could be of the form: "the goal is for the rate of inflation in Mexico to converge to the rates of inflation of industrial countries —in particular in the U.S. and Canada— within the next 2-3 years";
- To make it clear and transparent that the principal concern of the monetary authority (with the cooperation of the Treasury) is to ensure that the inflation target is met, and, therefore, that monetary policy will be adjusted whenever various indicators point to a tendency for deviation of actual (or expected future) inflation from target. Policy transparency can be enhanced by a central bank decision to publish a quarterly *Inflation Report* (as in the case of the Bank of England) or a semiannual report

[14] See the March 1995 economic program.

[15] For example, the inflation target in the United Kingdom has been set at the range of 1 to 4 percent per year for the remainder of the present Parliament (*i.e.*, probably until about 1996 or 1997), with the explicit intention to bring inflation into the lower half of the range by the latter part of this period.

(as in the case of the Federal Reserve Board of the U.S.), providing analysis of how the various factors in the economy are combining to result in the observed (and predicted) path for the rate of inflation. This publication would also provide some external discipline, in that the authorities would have to account for their actions in explicit relation to the extent to which they assess their ultimate objective is being met under the prevailing conditions.

Intermediate Targets and Indicators. An ideal intermediate target has a high correlation with the ultimate objective of monetary policy but is much easier to control. Yet, the problem is that it is difficult to find such an ideal intermediate target. In Mexico, the monetary base has been used as the intermediate target.[16] It is claimed that the monetary base has a reasonable stable relation with the price level. Moreover, the central bank can effectively change the monetary base via open market operations, which is a flexible and efficient instrument of monetary policy. The central bank can also affect the base indirectly through primary auctions of government paper. The operating rule has been that the monetary base is changed only in response to changes in the demand for the base. The latter is assumed to depend on expected inflation, economic activity, and seasonal factors. The rule implies that movements in international reserves are sterilized, unless they appear to imply a shift in the monetary base in the same direction as the change in the demand for the base.

The use of monetary aggregates, such as the monetary base, as intermediate targets has well-known limitations. *First* it can be shown that if money demand shocks (or financial disturbances) are the dominant force in the economy (as opposed to shocks to investment or consumption), then the use of the monetary base as an intermediate target can result in much higher volatility of output and interest rates than otherwise (see Poole, 1970). This argument appears to be especially relevant in the present decade of the 1990s, when there have been and are expected to continue to be substantial financial shocks and major portfolio adjustments in Mexico. *Second,* this procedure requires stable empirical estimates of demand for the base and good forecasts of velocity.

[16] These statements were based on our discussions with the central bank economic research staff.

Empirical failures on both these counts in the 1970s and 1980s, under the influence of financial innovation and liberalization, led various central banks to downgrade the importance of monetary targets as the basis for policy.[17] *Third*, the procedure does not make use of superior information by the central bank regarding the disinflation process. Erroneous expectations by the public, and lack of credibility about disinflation, may result in high nominal interest rates, which may turn out to be excessively high real interest rates to the extent that disinflation is indeed effected.

While the use of the monetary base as an intermediate target of monetary policy has resulted in satisfactory monetary and financial performance in Mexico in recent years, ex-post real interest rates have been relatively high. Moreover, the procedure was based on stable estimates of velocity and demand for the base, and there is no guarantee that such stability will hold under the financial innovations, liberalization, and international diversification of portfolios expected for the coming years. And financial shocks (*e.g.*, shocks to capital inflows) are likely to play an increasingly dominant role in the Mexican economy.

Accordingly, the foregoing discussion would suggest that one should consider shifting to the alternative procedure of having a short-term interest rate as the operational target for monetary policy, which could be particularly useful when used with monetary aggregates as intermediate targets.[18] The main distinction between an intermediate and operational target is twofold. First is the effect of the instrument on the target. In the case of an operational target the effect of an instrument is much quicker and direct than on an intermediate target. For instance, the effects of monetary policy instruments (changes in monetary base or central bank discount rate) on interest rates are almost immediate, while the effects on monetary aggregates tend to be spread out over a longer period. Second is the ability to measure monetary policy stance. The intermediate target is usually a nominal

[17] See Crockett (1993) for discussion and evidence that the relation between intermediate targets and ultimate objectives, as well as forecasts of velocity, became more variable in the 1970s and 1980s. As a result of this, many countries reduced the emphasis on monetary aggregates: Canada in 1982, Spain in 1991, and the U.K. in 1986. The United States redefined money growth targets as monitoring ranges in 1993, and even the Bundesbank has shown discretion with implementing its own (announced) monetary targets.

[18] This has been the case in Canada. Other central banks in industrial countries have employed interest rates as operational targets, see, *e.g.*, Bernanke and Mishkin (1992) and Kasman (1992). More detailed information on Canada is provided by Duguay and Poloz (1990), and on the United Kingdom by Crockett (1993).

variable that can be used as a nominal anchor to the system, while the operational target, such as the short-term interest rates, cannot serve as an anchor.

The use of short-term interest rates as an operational target could work as follows. Based on a reasonable estimate for the real interest rate plus a risk premium plus the inflation target range announced by the authorities, the central bank could determine the desired level for the short-term nominal interest rate. Open market operations would then be conducted to ensure that the market interest rate is close to the target; *i.e.*, the monetary base now becomes an endogenous variable. If the central bank and the Treasury have superior information indicating that the reduction in inflation is larger than what was expected by the public, the central bank intervention can increase the monetary base up to the point where the implied lower interest rate is a market outcome. These considerations are especially relevant for 1996, when the inflation target is 20 percent, well below previous inflation targets and performance. Under these circumstances, a 29 to 33 percent range for the short-term interest rate would seem to be a reasonable intermediate target for monetary policy (based on 18 to 22 percent inflation target range plus a 7 percent real interest rate plus a 4 percent risk premium).[19]

However, using short-term interest rates as a target has important shortcomings. In countries like Mexico exposed to a substantial amount of capital inflows from abroad the nominal interest rate might deviate from its covered interest rate position because it usually responds to supply and demand for capital inflows. Therefore, targeting the short term interest rate for disinflation objectives might lead to a shortage or to an excess of capital inflows.

In any case, if the short-term nominal interest rate is chosen as an operational target, it is for the central bank to decide whether or not the target interest rate level will be formally announced or not. In the case of Israel, there is a monthly announcement about the area within which the central bank plans to target interest rates, but there is no formal or implied commitment that ex-post interest rates will fall in that area.

Under the proposed regime, it should be well understood that the main indicator to which the monetary policy instrument responds is

[19] These estimates are based on the authorities inflation objective and international evidence.

the projected level of inflation, say 12 months ahead. When various indicators of inflationary trends suggest a danger of inflation exceeding the announced target, it would be appropriate to tighten monetary conditions by raising interest rates or reducing the rate of growth of the monetary base. Accordingly, substantial attention would be given to monitoring and interpreting indicators of inflation such as the slope of the yield curve, the output gap, survey and market-based measures of inflation expectations, the behavior of wages, the position of the exchange rate within the band, and so on.

In an open economy such as Mexico, *the exchange rate is likely to be an important intermediate target or indicator for monetary policy.* In fact, there is a close link between exchange rate policy and monetary policy: a free float provides the national monetary authorities with a great deal of room for autonomous policies, yet no such monetary autonomy can exist under a fixed exchange rate. Under the circumstances in Mexico, the exchange rate band regime is likely to be maintained in the near future at least as long as there is a convergence process toward inflation rates as in the United States. However, it is plausible to consider allowing more room for *exchange rate flexibility* by both widening the band and reducing the extent of intramarginal intervention. Increased flexibility may well be needed to deal with the changing nature of capital inflows and the large size of internal and external financial disturbances. As indicated, such increased flexibility will offer the central bank more autonomy over the stance of monetary policy.[20]

In addition to the exchange rate, it is likely that the Mexican authorities will closely monitor the behavior of *international reserves and capital inflows*, which could be defined as either indicators or additional intermediate targets. If so, it should be recognized that it will be difficult to simultaneously meet all intermediate targets at all times. That is, there could be episodes in which a *policy dilemma* (or conflict) arises between various intermediate targets, such as interest rates and exchange rates (or reserves). Put differently, commonly there are not enough degrees of freedom for policy to achieve simultaneously both the ultimate goal and all of the intermediate targets. In these

[20] Some indication of recognition by the authorities of the useful role that could be played by exchange rate flexibility within the band in dealing with shocks is provided by recent episodes of strong demand for US dollars, in November 1993 and February and March 1994. The exchange rate was allowed to reach the upper limit of the band in both these cases.

circumstances, it is for the central bank to decide which variables react first and which last to the disturbances.

To illustrate this potential dilemma, consider the central bank response to a sudden capital outflow in 1994. There were at least three reasonable policy reactions by the central bank in this case:

- to let the exchange rate depreciate within the band, with no change in official reserves or the short-term interest rate;
- to sell foreign exchange to the public, and to maintain the exchange rate and the short-term interest rate at their previous levels; and
- to raise the short-term interest rate to defend both the band and official reserves.

A priori, there is no clear-cut guide for choosing among these policies. The optimal choice by the authorities depends on the relative importance of the various intermediate targets and indicators in policy-maker preferences. It also depends on whether the shock is perceived as transitory or permanent, and on whether it comprises the ultimate inflation target. In Israel, the second option is the one that would be chosen by the central bank had there been a perception that the shock is transitory. In Chile, in contrast, some combination of the first and the third options would most likely have been chosen.

The experience of Mexico until mid-1994 indicated a deep concern with reducing inflation and, at the same time, attracting capital inflows and building up international reserves. This has probably *overburdened monetary policy,* which had no choice but to provide interest rates high enough to meet these goals (along the lines of the third option above). However, things could change in the near future as fiscal discipline becomes the norm and as there is increased determination to allow for increased flexibility of the exchange rate. Under these conditions, a combination of the first and second options would represent a reasonable central bank reaction to sudden and transitory capital outflows rather than the alternative of relying on the third option. The latter could be kept for those cases in which the capital outflow is perceived to be more *permanent* and/or there is a need to defend the exchange rate band and reserves against a strong (temporary) speculative attack.

The Bottom Line

The proposed policy framework places a strong emphasis on specifying and announcing the ultimate objective of monetary policy —the gradual reduction of inflation and its convergence to the levels prevailing in Mexico's main trading partners. The policy framework is based on the standard transmission mechanism under limited exchange rate flexibility, in which monetary policy operates through changes in interest rates (or the monetary base) and in foreign exchange market intervention, and influences the rate of inflation with substantial lags. Two key variables play the role of intermediate targets or indicators for monetary policy: a short-term interest rate (or the monetary base growth rate) and the exchange rate. As far as the latter is concerned, the suggestion is to continue having a crawling exchange rate band whose width gradually expands with time. In addition, policy would rely on continuous monitoring of various financial and economic indicators and on the signals they provide about the likelihood that the ultimate objectives would be attained under the prevailing policy. The framework is pragmatic and eclectic: it does not rely on strict reaction functions (or rules) for the setting of the policy instruments. However, it does rely on a strong and transparent commitment to an announced inflation target. This means that policy instruments would have to be adjusted when the arrival of new information points to serious risks about the achievement of the ultimate objective.

Two main sets of arguments are likely to enter the central bank reaction function: first, any projected discrepancies between actual and target inflation, and, second, actual and expected foreign exchange market pressure. Let us illustrate the proposed strategy for monetary policy reaction to these arguments with two realistic examples. First, consider a case when new information indicates that nominal aggregate demand is running above the projected level. Other things equal, this would imply that if policy is not adjusted, the goal of policy (*i.e.*, the inflation target) would not be achieved as originally planned. In order to be consistent with the ultimate objectives, monetary policy would have to be tightened. Accordingly, the central bank can be expected to initiate an upward adjustment in interest rates (or a downward adjustment in monetary base growth). Second, consider a transitory rise in interest rates in the U.S. which gives rise to a sudden capital outflow and to foreign exchange market pressure toward a more depreciated exchange rate and/or lower official reserves. If underlying

fundamentals are unchanged, the central bank could meet this shock by some foreign exchange market intervention and some depreciation of the exchange rate within the band. When necessary, for example, during a speculative attack, these measures could be reinforced by a rise in interest rates.

As indicated, it is difficult to formalize the foregoing reactions in simple and strict rules. Given the changing nature of the transmission mechanism of monetary policy in the 1990s, it is well for the central bank to exercise some judgment, and a process of successive approximations, in setting and adjusting monetary policy instruments. At the same time, it is recommended that the policymaker reveal to market participants the considerations taken into account in formulating monetary policy.

C. International Experience

In this section we review the experience of other central banks in terms of central bank independence and of the monetary policy framework used. This will illustrate the problems that other central banks have faced and possible ways to overcome them. In addition, it helps to compare the monetary policy framework suggested in Section B with the experience of other central banks. We organize the rest of the section as follows. First, we briefly review other central banks in terms of accountability and monetary policy frameworks used; and second, we focus on problems in implementing the inflation target framework.

Accountability and the Monetary Policy Framework

Recently the role of central banks has experienced a change in two major directions. First, governments granted central banks the clear price stability mandate and made them fully accountable for the fight against inflation.[21] Second, central banks have reconsidered their monetary policy framework for controlling inflation.

[21] Although the new independent central banks usually have relied on the support of fiscal policy, some central banks have lacked supportive fiscal policy, jeopardizing the central bank fight against inflation.

The Central Bank Mandate and Accountability

Influenced by the successful experience of the Bundesbank in the fight against inflation, most modern central bank legislation has given central banks a single mandate: *price stability*. This mandate should not be interpreted as an end in itself; it is rather a means to an end, the end being a sound economy with high levels of employment and rising standards of living. The 1970s experience with high inflation rates and with central banks trying to attain full employment objectives using monetary policy instruments led to a reconsideration of the central banks' main objective. The high inflation rates of the 1970s led governments to decide making the main objective of central banks the fight against inflation. Policy-makers soon realized that monetary policy could only affect the level of employment in the short term but perhaps at the expense of higher inflation in the future. Moreover, empirical analysis on the effects of inflation indicate that reducing the rate of inflation would make the economy more efficient and productive and that high inflation rates impose a heavy burden on the economy.[22]

Another important reason to make price stability the focus of monetary policy was the experience of central banks and the theoretical developments in expectations formation. Before the 1980s, monetary policy of central banks was assigned several objectives which most of the time were in conflict, such as price stability and full employment. Because of this conflict in objectives central banks failed to meet them. Moreover, it was impossible to assess the extent to which central banks were in fact aiming at these objectives; that is, there was little accountability. In the early 1980s this led to a reconsideration of the central bank mandate.

Most of the new central bank legislations assign a single mandate to central banks and make Governors and Board of Governors accountable for meeting this mandate. This greater focus on one single mandate was further reinforced by the theoretical research on expectations and time consistency (*e.g.*, Poole, 1970) which stressed the need to make the focus of monetary policy the control of inflation. Because monetary policy can only influence the inflation rate in the medium term, that is, price expectations cannot be changed over night, monetary policy needs consistency over time.

[22] See Bruno and Easterly (1995) for recent and compelling international evidence of the adverse effects of inflation on economic growth.

As a result, most central banks opted for similar mandates and for making the central bank accountable for the fight against inflation. In Table 1 we summarize the experience of six modern central banks in terms of mandate and accountability. The adoption of the price stability mandate by most of these central banks was influenced by the Bundesbank's success in fighting inflation. In the early 1990s, the Reserve Bank of New Zealand and the bank of Canada embraced price stability as the single mandate and the results in terms of inflation have been apparent. The only exception is the US Federal Reserve Board System that has several objectives ranging from price stability to the attainment of full employment. However, on repeated occasions in hearings before the US Congress, Chairman Greenspan has made it clear that he would favor a single price stability mandate.

In general, in most central banks, responsibility and accountability for the fight against inflation lies with the Governors and the Boards of Governors; and most central bank legislations make special provisions to grant independence to the Board of Governors from the Minister of Finance or the Executive. However, legislation varies among countries in the way it has provided central bank independence. For instance, in countries like the U.S. and Germany, the Executive branch can only appoint a minority of the members of the board and the Governor and members of the Board are accountable only to Congress. In other countries such as Canada and New Zealand the Minister of Finance appoints the Governor and the Board of Governors but independence of the central bank Board is ensured by making special provisions for overriding the Governor. To this effect, the Minister of Finance has to submit to Parliament a detailed statement explaining the reasons for the disagreement and the time during which it would like to change the targets. (Until now these provisions have not been used in either country.) The only central bank that has no special provision for independence is the Bank of England since it is not independent from the government. Responsibility for the fight against inflation lies whith its Board but ultimately on the Chancellor of the Exchequer.

An important provision for ensuring central bank accountability is the requirement to submit frequent reports to Parliament explaining monetary policy objectives and performance in relation to monetary policy targets. Although most central banks publish some basic information such as balance sheets, annual reports and financial statements, central bank legislation differs in provisions to submit frequent

Table 1. Comparison of Central Banks' Mandates and Monetary Policy Targets

Bank	*Responsibility for Implementing Monetary Policy*	*Appointment of Board of Governors*	*Accountability*	*Reporting to Congress*	*Ultimate Goal or Main Target*	*Intermediate Target*	*Policy Instruments*
Bundesbank	The Council of the Bundesbank consisting of the ten members of the directorate (The President, the Vice-President and eight other members) and the presidents of the eleven Land (state) central banks.	The Federal Government appoints the members of the Directorate, that is, the ten members of the Council.	The members of the Council are not accountable to the government and cannot be removed until the eight-years period expires.	To ensure support for its policies the Bundesbank follows an active and open information policy which might be regarded as part of public accountability.	To preserve the domestic value of the currency.	Formally, the Bank publishes annual targets for M3 and althougth they don't publish interest rates targets they use short term interest rates as operational targets.	Since 1980, the Bank relied on open market operations using the tender system for repurchase agreements. The Bank either fixes the interest rate, the volume, or a combination of the two. In addition they use the discount rates and the Lombard facility.
Bank of Canada	The Management Committee consisting of the Governor, the Senior Deputy Governor, Deputy Governors, Advisers and the Secretary of the Bank.	The Minister of Finance appoints the twelve outside directors who in turn appoint (under the supervision of the Minister of Finance) the Governor, Senior Deputy Governor and the other Deputy Governors.	The Bank of Canada Act establishes that the Minister of Finance and the Governor shall consult on monetary policy and that the Minister can override the Govenor in case of disagreement.	The Act requires that the Governor report on monetary policy performance to the Minister of Finance. In addition, the government is proposing that the Governor appear at least twice a year before a parliamentary committee to explain monetary policy performance.	Price stability.	The Bank Governor together with the government announces an inflation target range which is in the form of a target range for the near future (say the next year) and a path to price stability. In addition the Bank uses the MCI as an operational target.	Open market operations using a variety of eligible securities for repurchase agreements. In addition the Bank also has a discount rate.
Bank of England	The Board of Directors.	The Chancellor of the Exchequer.	The Bank is not independent and is fully accountable to the government.	The Bank publishes the "inflation report" where it explains the performance of monetary policy.	To influence the growth of nominal domestic product as a means of achieving price stability.	Since the late 1980s when demand functions broke down it has published range targets for M0 and recently it is publishing inflation targets ranges.	Open market operations by offering to rediscount treasury bills, local authority bills, or bank bills that have already been discounted by discount houses. The Bank sets a "stop rate" which determines the lowest rate of discount. In addition, the Bank also offers direct loans, the so-called "2.30 p.m. lending."

Table 1. Concludes

Bank of Mexico	*The Board of Directors consisting of the Governor and four other Board members.*	*The President appoints the Governor and the Board members.*	*The Governor and the Board of Governors are accountable to Congress.*	*Annually the Bank will submit two reports to Congress, one in April and the other in September.*	*To preserve the domestic value of the currency.*	*To be defined.*	*Open market operations using treasury bills and other securities for repurchasing agreements. Like the Bundesbank the Bank can decide to fix the volume, the interest rate, or a combination of the two.*
Reserve Bank of New Zealand	The Board of Directors consisting of between seven and ten members.	The Minister of Finance appoints the Directors and the Governor.	The Governor is directly accountable for meeting the published targets and the Minister of Finance can override him in case of disagreement.	The Bank should publish the Policy Targets Agreements and submit to Parliament every six-months monetary policy statements.	Maintain stability in the general level of prices.	The Bank publishes an inflation target range.	Open market operation.
U.S. Federal Reserve Board System	The Federal Open Market Committee consisting of seven members of the Board of Governors and five presidents of the twelve district Reserve Banks.	The seven members of the Board of Governors are appointed by the President for a 14-year term and the Chairman and Vice-Chairman are appointed for a four-year term.	The Chairman and the Board of Governors are accountable to Congress.	The Humphrey-Hawkins Act of 1978 requires that the Fed report to Congress semiannually on monetary policy objectives and expectations about the performance of the economy.	Maintain long run growth of the monetary and credit aggregates to promote maximum employment, stable prices, and moderate long-term interest rates.	The Humphrey-Hawkins Act requires that the Fed report targets for monetary aggregates. But since the mid-1980s when money demand functions broke down, the Fed has been targeting the interest rate without publishing targets.	Open market operation using treasury bills for repurchasing agreements. In addition, it also uses the discount rate and bank reserve requirements as instruments.

Source: Batten *et al.* (1990), Bank of Canada (1991), Congreso de los Estados Unidos Mexicanos (1993), Crow (1993a, 1993b), Duguay and Poloz (1993), Freedman (1993 and 1994), Lloyd (1992), and Madigan (1994).

monetary assessments to Parliament. The central banks with the most clear mandate are the US Fed and the Reserve Bank of New Zealand. Both the 1978 Humphrey-Hawkins Act in the U.S. and the Reserve Bank of New Zealand Act require that the central bank publish and submit to Congress semiannual reports. In the case of the U.S. the Fed should submit a semiannual report assessing monetary policy against the monetary aggregates targets, and explain the monetary policy objectives, and the Fed's expectations about the performance of the economy. The Reserve Bank of New Zealand must submit monetary policy statements reviewing the implementation of monetary policy over the period since the last statement and detail the policies and means by which monetary policy will be directed in the future. Although in the other three countries there are no formal requirements, they keep the public informed of their main monetary policy objectives and it is fair to say that they are converging to the semiannual report system of the U.S. and New Zealand. To gain public support for its policies the Bundesbank pursues an active and open information policy; the Bank of Canada submits special reports to the Minister of Finance on monetary policy objectives and performance, and in the future the government is planning to amend the Bank of Canada Act to formally require the Bank to publish and submit to Congress semiannual monetary policy reports; and the Bank of England to gain support for its monetary policy publishes the so-called "inflation reports".

The Monetary Policy Framework

Another important change in central banks has been in the monetary policy framework. Until the late 1970s, most central banks announced target ranges for nominal monetary aggregates, based on the assumption of stable demand for money functions. However, in the early 1980s most of these demands for money functions broke down in the face of financial innovations, deregulation and shifts in asset-holders' portfolios. Money demand functions based on monetary aggregates were no longer useful for forecasting nominal output although in most cases they were used in the context of a greater econometric model. Therefore, it became difficult to assert how much of the changes in monetary aggregates resulted from endogenous factors such as changes in nominal income and interest rates, and how much to exogenous factors such as financial innovations or exogenous shocks. This led most central

banks either to abandon the use of target ranges for monetary aggregates, or to limit their importance in determining monetary policy stance, or both.

Although most countries reported in Table 1 went through similar experiences, they adopted different procedures to implement monetary policy. In the U.S. the 1978 Humphrey-Hawkins Act requires the Fed to publish target ranges for monetary aggregates and to evaluate its monetary policy against these targets. The Fed used these targets on M1 for monetary policy until 1981 when most of the money demand functions broke down as a result of high inflation, financial innovation and shifts in the portfolios of asset-holders; since then the Fed has used short-term interest rates as an operational target. Based on observations of federal funds rates, the interest yield curve, and other information on nominal income, the Fed determines the ranges of nominal interest rates consistent with its inflation forecasts.

The Bundesbank had a very similar experience. There is evidence that the Bundesbank is placing greater discretion on implementing its monetary targets and is relying more heavily on short term interest rates as operational targets.

The Banks of Canada, England, and New Zealand, which had a similar experience, adopted a bolder alternative: inflation targets. In the early 1980s the three central banks stopped relying on monetary aggregates as intermediate targets. Although these central banks continue producing target ranges for monetary aggregates, they use these targets as informational variables and only publish target ranges for annual consumer price inflation. To understand better how to make the inflation target framework operational, in the rest of this section we will review the experiences of the Bank of Canada and the Reserve Bank of New Zealand.[23] Both central banks use annual inflation as targets for monetary policy and publish them jointly with the government.

In the case of Canada the government announces the inflation targets annually at the time of submitting the budget to Congress, and at the same time the Bank of Canada issues a press release providing the details on the inflation targets. In the case of New Zealand the inflation targets are announced in the policy targets agreements (PTA) that are signed by both the government and the Governor of the central

[23] See Freedman (1993 and 1994), Friedman (1993) and Duguay and Poloz (1993).

bank. The Bank of Canada decided to make the first guidepost of inflation 22 months after the announcement, and to simultaneously announce the long-term path for inflation. It announced the inflation target ranges for 1992 to 1995 which would lead to price stability. Fixing the first guidepost 22 months after the announcement was justified by the long lags with which monetary policy affects inflation. The Bank of Canada estimates that these vary between four and eight quarters. The announcement of the long-term path of inflation was justified by the bank Canada as a signal to the market participants of the central bank's commitment and to enable firms and individuals to adjust to these rates of inflation.

As a result of the breakdown of the demand for money functions, both countries have been searching for alternative intermediate targets that could stand somewhere between the ultimate goal, the inflation target, and the central bank's monetary policy instruments, the expansion of base money or discount rates. Since the mid-1980s when the intermediate targets were abandoned, both central banks resorted to short-term interest rates as operational targets and used monetary targets as informational variables. Although using short term interest rates as an operational target allows the central bank to assess the effect of monetary policy relatively quickly, interest rates are not a nominal variable and thus the central bank cannot use them as nominal anchors. This is the role of intermediate targets such as monetary aggregates.

To substitute for the intermediate targets the Bank of Canada is using two alternative procedures to determine the monetary stance. First, using economy-wide medium and short-term econometric models the Bank staff translates the target ranges for annual inflation into forecasts ranges for monetary aggregates (M1 and M2), the exchange rate level and short-term interest rates. Using these forecasts the Bank staff anticipate shifts in output and prices, which are then used to make adjustments to the monetary policy stance. The procedure is as follows. Using these econometric models the staff produce forecasts for monetary aggregates, the exchange rate, and interest rates for periods that vary from 6 to 7 quarters in the medium term model, and 2 to 4 quarters in the short-term. Moreover, using the short-term model and the most recent information, the Bank staff can make these forecasts once a week. By comparing the forecasts ranges for these variables with the actual values, the Bank staff can indicate how much of the deviation results from shifts in real output and how much from prices. Although it is common for some of the deviation in

high frequency data to result from short term disturbances or institutional development, persistence in these deviations indicates shifts in output or prices. It is argued in the case of Canada, for instance, that persistent deviations in M1 are a good leading indicator for shifts in output, while the deviation in M2 are a leading indicator for shifts in prices. Second, the Bank of Canada uses a monetary conditions index (MCI) as an operational target which it regards as a more accurate indicator of monetary policy stance. The MCI is considered a more accurate operational target than short-term interest rates because: *a)* monetary policy usually affects both interest rates and exchange rates, and *b)* helps to determine to what degree of exogenous shocks that result in changes in exchange rates and in aggregate demand need to be offset through monetary policy. In other words, the MCI is particularly useful to offset the overvaluation of the ER that could take place as a result of monetary shocks. The MCI is a weighted average of the short-term interest rate and changes in the exchange rate and is estimated relative to a base year. The weights indicate the proportion of monetary policy changes that are translated into changes in interest rates and in the exchange rate, respectively. Using the econometric models, the Bank forecasts operational target ranges for MCI that are consistent with the inflation targets objective, and deviations of actual relative to the forecast ranges prompts changes in central bank monetary policy stance. The MCI in addition to being an important operational target, enables the monetary authorities to offset through monetary policy changes the effect of monetary policy shocks on the nominal exchange rates and in aggregate nominal demand.

Like most other operational targets used by central banks, the MCI also presents problems. Two in particular should be borne in mind. The first is that the MCI cannot substitute for a nominal variable and cannot perform the role of a nominal anchor to the system. Central banks can enhance the effectiveness of monetary policy by combining the use of the MCI with other monetary aggregates as intermediate targets. Because monetary policy is ultimately about how monetary expansion affects nominal income, monetary authorities need a nominal variable that serves as a measure of monetary policy and as a nominal anchor to the system. The second is that changes in the MCI do not always respond to changes in monetary policy conditions. This problem argues against the mechanistic use of the MCI for determining changes in monetary policy stance. On a day-to-day basis exchange rates might fluctuate in response to short term changes in speculators'

expectations rather than to changes in price expectations. Moreover, in some other cases long-term changes in the exchange rate are associated with terms of trade or financial shocks, and others from a loss of confidence in the local currency or political shocks. It is not clear that these changes in exchange rates should prompt a change in the monetary policy stance with the objective of meeting a desired MCI target. In the case of loss of confidence or political shock the central bank might need to encourage or validate the increase in interest rates.

Problems in Implementing the Inflation Target Framework

The experience of countries that implemented the inflation targets framework suggest that there are some important questions that need to be answered in advance.[24] The answers to these questions, however, are likely to depend on the initial conditions prevailing in each country. The following are the most important.

- *How fast should the decline of the target inflation be*? This has been extensively discussed in the economic literature and there are different views. Usually a gradual decline is argued based on the existence of long term contracts, lags in adjustment behavior, and lags in the adjustment of inflation to expectations. However, it is possible to argue in the opposite direction as well based on the assumption that a rapid disinflation could break entrenched expectations. Experience suggests that it is important to strike a balance between these two opposing views. But as we argued in Section B, the pace should not undermine the credibility of the central bank.
- *What measure of inflation should be used?* The central bank can select among several indices and consider some refinements to even out the wide fluctuations as a result of seasonalities, that is, food prices. Experience suggests that it is preferable to use the annual rate of change in the consumer price index. First it is the price index most readily available; and second it is the one most persons use. This will make the assessment of central bank performance more transparent.

[24] This section was written based on the experiences of Canada and New Zealand and liberally borrows ideas contained in Freedman (1993 and 1994).

- *What should the response to large price shocks be?* Cases of major price shocks might justify changes in the entire target path but this should be done in very unusual circumstances. Examples could be the sudden increases in oil prices or price increases resulting from major natural disasters. To avoid erosion in central bank credibility and commitment to inflation reduction, central banks should avoid frequent changes to the targeted inflation path. Frequent changes in prices could result, for instance, from supply shocks such as a shortage of food supply.
- *How much should the inflation deviate from the target range?* Experience suggests that the authorities should try to keep the inflation rate around the target ranges during the course of the assessing period. Frequent and large deviations could lead market participants to believe that the central bank might not meet the target. However, on unusual occasions and as a result of exogenous shocks, the inflation rate might move out of the target range. Moreover, the central bank might be unable to bring the inflation rate into the target range in the short term because monetary policy affects inflation with a lag. In these special situations the central bank might need to explain the nature of the problem to avoid eroding its credibility. A case that should be avoided is that in which supply shocks push the inflation rate out of the target range.

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