CHAPTER 23

# The Art of Central Banking: Targets, Instruments, and Autonomy[1]

## LEARNING OBJECTIVES

**After reading and studying this chapter, you should be able to**

**23.1** explain the distinction between economic variables that are instruments of monetary policy and those that are targets of monetary policy

**23.2** describe why monetary policy involves choosing either to control an interest rate or to control the money supply, but not both

**23.2** explain how the Monetary Conditions Index works and what it measures

**23.3** analyze why political influences arising from elections or partisan political factors, or from the legal relationships between a central bank and the government, are important

**23.3** determine why central banks might follow rules in setting interest rates

Since central banks are generally responsible for matters of monetary policy, their actions influence or are influenced by movements in interest rates, monetary aggregates, and exchange rates. We have already described various empirical features and theories relative to these three variables, ignoring the special rules of the central bank. Having described such an institution in the previous chapter, it now seems appropriate to discuss the place of the central monetary authority in the financial system.

In doing so, we focus on principles applicable to all (or most) industrialized countries. We might have chosen otherwise. The art of central banking is sometimes considered to be specific to the particular financial institutions of an economy and thus to vary greatly from country to country. However, globalization and increasing agreement that central banks should be independent of the fiscal authorities have reduced differences among financial systems. As a result, this chapter concentrates on general principles.

We might ask if central banking is indeed an art. As we will see in this chapter, central banking today is in practice a mix of art and science. This science is helpful to understanding what central banks do, but there is indeed quite a lot of art in knowing when to take action.[2]

1 This chapter title is taken in part from a book by R.G. Hawtrey. In that book, Hawtrey describes the various links between central bank actions and economic activity in general, as well as the design of central bank institutions. See R.G. Hawtrey, *The Art of Central Banking*, 2d ed. (New York: Kelley, 1970).

2 To quote Alan Blinder, former vice-chair of the U.S. Federal Reserve and professor of economics at Princeton University: "Having looked at monetary policy from both sides now, I can testify that central banking in practice is as much art as science. Nonetheless, while practicing this art, I have always found the science quite useful." See A. Blinder, *Central Banking in Theory and Practice* (Cambridge, Mass.: The MIT Press, 1999): 17.

We begin with a discussion of the targets and instruments of monetary policy. The instruments are the variables that can be influenced directly by central bank action, and they are well known. Somewhat more controversy exists about the targets of monetary policy, especially as the role of central banks has evolved over the past decade or so.[3] Should a central bank try to reach its goals by affecting the money supply or by controlling interest rates?[4]

Next, we consider the advantages and the disadvantages of monetary control and of interest rate control. Even if neither approach is inherently superior, perhaps one is easier to follow or has fewer harmful side effects.

The chapter concludes by considering central bank independence. What does independence mean? What are the economic consequences of ignoring it? What is the evidence of the relationship between central bank independence and economic performance?

## 23.1 TARGETS AND INSTRUMENTS OF MONETARY POLICY

All monetary authorities face problems choosing and meeting final goals. We can illustrate the inherent difficulties with the help of a diagram such as the one in Figure 23.1. Central banks possess **operating instruments**—tools with which they can do their work, such as manipulating the monetary base, changing the overnight rate, conducting open market operations (OMOs), and so on.[5] Changes in these operating instruments more or less directly influence **intermediate targets**, which are usually some measure of the money supply or some key interest rate (one that is related to most other interest rates in the economy). In countries that target inflation, such as Canada, the intermediate target might be the current forecast of inflation.[6] Hence, an intermediate target is best thought of as a variable that provides useful information about final goals.

The point of central bank action is not only what actually happens to these intermediate targets (the size of the money supply, for example, is not very interesting per se), but also (and just as important) the performance in the economy of various **ultimate goals**, such as inflation, unemployment, and exchange rates, individually or in some combination.

The difficulty of achieving some final target in this two-stage process is partly posed by the uncontrollables of monetary policy. For example, the influence of operating instruments on intermediate targets is largely determined by the size and stability of the money multipliers. But which money multiplier should be selected from among the long list of candidates? The issue is no different from the question of which monetary aggregate is the best indicator of the money multiplier over time, and choosing M1 or M2+ leads to a dramatically different picture. Moreover, how stable is the money multiplier chosen? If it is predictable, the monetary authorities will have a fairly good idea of the link between the operating instrument and the intermediate target. Otherwise their actions will have a significant measure of uncertainty.

3 For those interested in the details of this evolutionary process, see P.L. Siklos *The Changing Face of Central Banking: Evolutionary Trends Since World War II* (Cambridge: Cambridge University Press, 2002).

4 An observant student might ask: What about controlling the exchange rate? In Chapter 8 we entertained the possibility that policymakers might want to fix the exchange rate. Nevertheless, a growing number of countries have found that having an independent monetary policy requires a floating-type exchange rate regime. In essence then, there is no need to discuss central bank policy under a pegged exchange rate since that policy is dictated by the central bank in the country to which the exchange rate is pegged. Moreover, Canada has the distinction of having employed a floating rate longer than any other industrial country. Therefore, we do not explicitly consider the exchange rate, although, as we shall see later in this chapter, it can still play an important role in the conduct of monetary policy.

5 These tools are discussed in Chapter 22 and elsewhere, so we do no more than list them here.

6 This point is made by Lars Svensson, "Inflation Forecast Targeting: Implementing and Monitoring Inflation Targets," *European Economic Review* 41(6): 1111–46. Such a policy can be dangerous. Why? Simply because forecasters might then always project inflation to be equal to the announced inflation target, thereby providing no useful information to policymakers. See B. Bernanke, and M. Woodford, "Inflation Forecasts and Monetary Policy," *Journal of Money, Credit and Banking* 29 (4): 653–84.

Even if intermediate targeting is well within the reach of central banks, the questions remain of specifying the final target and of predicting its course. Thus, the two problems that plague the relationship between operating instruments and intermediate targets also remain. The behaviour of the velocity of circulation can, for example, sever the link between a monetary aggregate and inflation. And, unless monetary policies as practised by the central bank are believed by the public—that is, unless they are credible—the final target may not be attained.

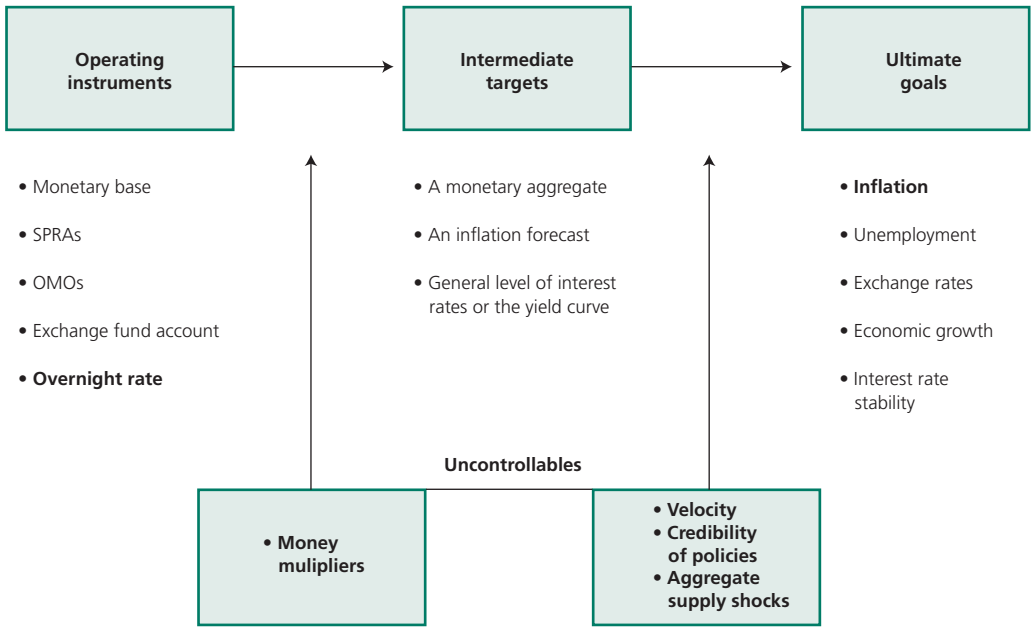
Another question is whether a central bank should be committed to a single target, such as **price stability**, or seek to achieve multiple objectives, such as a combination of inflation, unemployment, and economic growth. The difficulty with specifying multiple final targets is that they often conflict with one another. For example, inflation and unemployment targets may not be compatible goals (see Chapter 21). Add to this the complications that arise because of the relationship between exchange rates and interest rates, and an optimal policy mix becomes more difficult still to attain.

Finally, policymakers' goals may conflict with those of the central bank or with those of the public. Someone has to decide for which group in society the policy mix should be optimal.

## 23.2 MONETARY VERSUS INTEREST RATE CONTROL: A SIMPLE CHARACTERIZATION

Despite the room for error, central banks do take action in financial markets. We can use a simplified supply–demand diagram to explore the consequences for interest rate stability of a policy

**Figure 23.1** Instruments and Targets of Monetary Policy




The lists here are by no means exhaustive. Ultimate goals, for example, might also include stability in financial markets and full employment. In bold characters are the chosen operating instrument and ultimate goal of monetary policy in Canada.

## ECONOMICS FOCUS 23.1 OUT OF CONTROL?

Most central banks have a long-term objective (sometimes vaguely stated) of promoting economic growth and achieving price stability (low or zero inflation). Meeting the latter goal can impart an inflationary spin to an economy. Moreover, some analysts suggest that recent changes in the financial systems have undercut the efficacy of some of the central banks' tools. Deregulation—the removal of capital controls, interest rate ceilings, and credit-rationing, to name but a few examples—may have reduced central banks' ability to influence the growth of credit, with the loss of control meaning higher inflation in the future. An OECD study suggested that central banks now need to practise interest rate "overkill" to achieve credit control. (In other words, interest rates have to rise by a larger percentage and for a longer period than in the past to achieve a reduction in credit demand. In economic terms, this translates into a lower interest elasticity of credit demand with respect to that interest rate.) All this is a reaction to the belief that bond and foreign exchange markets drive monetary policy rather than the other way around. The reaction of Mexico's government in the wake of the 1994 devaluation of the peso, and pleas by presidents of such countries as Argentina and Peru to foreign investors not to take their billions out of their economies are examples of this phenomenon.

Ironically, when the Eurodollar market experienced meteoric growth during the 1960s and 1970s, similar concerns were expressed. The U.S. Federal Reserve had no direct control over this market. The worry then was, what would happen if all Eurodollars were repatriated to the United States? Clearly, the resulting expansion in credit would be tremendously inflationary. The fears proved unfounded; today most Eurodollars remain offshore to finance trade and other financial needs abroad. Nevertheless, there is always the potential for financial innovations to reduce the efficacy of domestic central banks' control over monetary policy.

A further reason for the concern expressed about the ability of the regulators and the monetary authorities to control the financial system stems from the plethora of scandals that have plagued financial markets over the past few years. The Japanese brokerage scandal, in which large firms were compensated for losses incurred at the hands of brokerage firms, the fraudulent activities of the Bank of Credit and Commerce International (BCCI), and the attempt by Solomon Brothers to corner the market for U.S. securities, to name but three examples, suggest to some that financial practices can no longer be effectively regulated. Even the *Wall Street Journal* says, "Regulation is a lagging indicator" (28 August 1991); that is, financial innovations that overcome some existing regulatory obstacles occur at a far faster rate than does the ability to legislate their uses.

The Asian crisis in 1997 also led to fears of a global financial meltdown that fortunately did not take place. Each of the foregoing examples raises the issue of the pitfalls that central bankers, in particular, face in dealing with day-to-day events and how they might affect the marketplace and the economy as a whole versus their responsibility for the maintenance of price stability (and perhaps adequate economic growth). The latter is a longer-term objective that requires some patience. Hence, the danger always exists that policymakers can develop "tunnel vision," thereby overreacting to what appear to be random events with little lasting impact on the overall objectives of monetary policy. As a result, whereas central banks during the 1980s were not specifically mandated to consider financial stability of the financial system as a separate goal of monetary policy, by the 1990s, at least half of the central banks in industrial countries were directed to concern themselves with the maintenance of a stable financial system.

### Questions for Discussion

1. If interest rate overkill is practised, does the policy have wider implications for inflation or economic growth?
2. Would the shift in funds toward stock markets also lead to central banks practising a form of overkill in setting interest rates?

### Sources

"The Bank of Canada and the Money Market," *Bank of Canada Review* (May 1989): 17–33.

"Out of Greenspan's Hand," *Economist* (27 October 1990): 81.

D. Sanger, "Do Financial Markets Now Make Policy?" *New York Times* (19 November 1995): 3.

P.L. Siklos, "Pitfalls and Opportunities for the Conduct of Monetary Policy in a World of High Frequency Data," in *Information in Financial Asset Prices*, Proceedings of a conference held by the Bank of Canada (Ottawa, Ont.: Bank of Canada, 1999): 331–69.

for which the intermediate target is **monetary control**—controlling the money supply—versus one that aims at **interest rate control**. This is, of course, a significant simplification of the problems apparent from Figure 23.1,[7] but it will clearly illustrate the dilemmas and difficulties faced by central banks in conducting monetary policy.

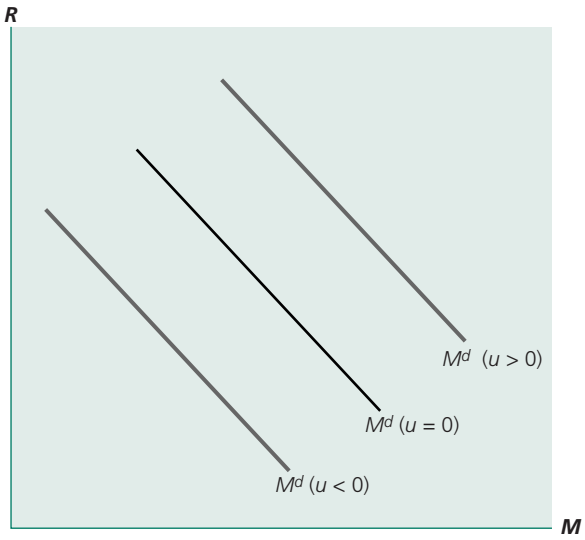
We start with a familiar framework. Figure 23.2(A) shows various representations of the demand for money, which we first encountered in Chapter 6. Recall that this demand is positively related to the price level, $P$, and to real income, $y$, and negatively to the nominal interest rate, $R$. The vertical axis in Figure 23.2(A) reproduces the functional relationship between these variables and the demand for money that was derived earlier in the book. The black downward-sloping line shows one such demand for money curve drawn for a particular level of real income, nominal interest rate, and the price level. Because of changes in other unpredictable factors, the curve shifts over time. Suppose these unpredictable factors, which we'll summarize by the term $u$, influence money demand in a fashion that is random but averages to zero.

Figure 23.2(B) shows the money supply function, which we also encountered in Chapter 6. Once again the functional relationship that drives the quantity of money supplied is also shown on the vertical axis of Figure 23.2(B). The quantity of money supplied is positively related to the nominal interest rate. But, as we saw in Chapter 22, the money supply is influenced by other factors that are not under the direct control of the monetary authorities: the currency–deposit

**Figure 23.2 Instrument Control: The Basic Relationships**

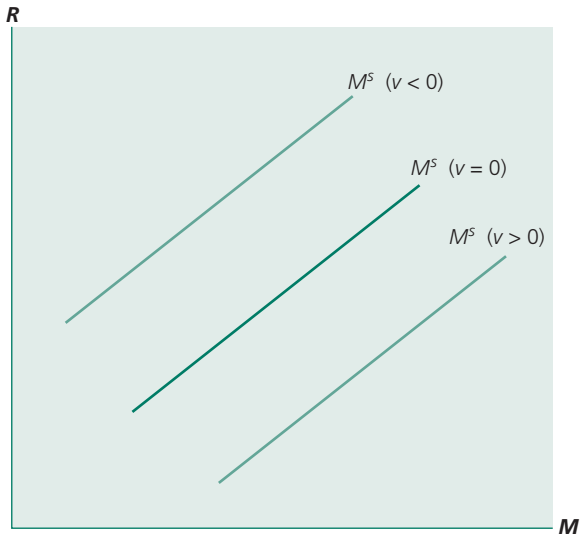
**(A) Demand for Money**

$M_t^d = P_t \cdot f(y_t, R_t) + u_t$




**(B) Money Supply**

$M_t^s = I(R_t) \cdot \text{Base}_t + v_t$




The demand for money curve is downward sloping but shifts randomly over time because of $u$, whose mean is zero. The black line in panel (A) is the demand curve when $u$ is at its mean of zero; the grey lines are the demand curves when $u$ is less than or greater than zero. The supply of money curve in panel (B) shifts randomly with $v$ because the monetary authorities do not exercise perfect control over the money supply. $v$ also may be negative or positive but its mean is zero. (For more on the demand for money curve, see Chapters 6 and 11; for more on the supply of money curve, see Chapters 6 and 22.)

7 We do not, for example, consider other possible final targets. Neither do we discuss the choice of an appropriate monetary aggregate nor which operating instruments are used. What follows is a restatement of sorts of the classic analysis by Poole. See W. Poole, "Optimal Choice of Monetary Policy Instrument in a Simple Stochastic Macro Model," *Quarterly Journal of Economics* 84 (May 1970): 197–216.

ratio and the reserves of the banking system. Here we lump together the effects of these uncontrollables in the term $v$. Once again, we assume that although $v$ shifts the money supply function in an unpredictable fashion, it averages zero.

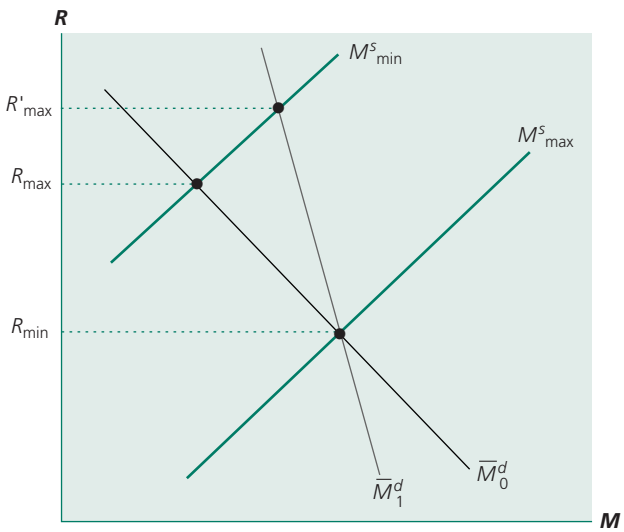
## MONEY SUPPLY CONTROL

Let us now consider the implications of monetary and interest rate control, starting with the former. We stressed in the last chapter that money supply cannot be perfectly controlled through manipulations of high-powered money. The basics are outlined in Figure 23.3(A).

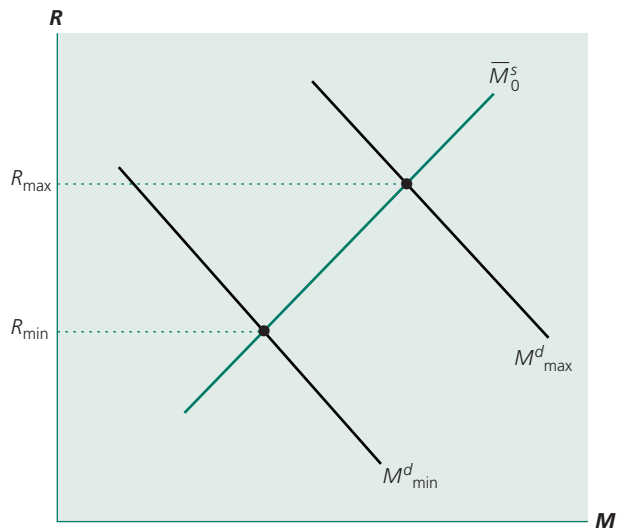
Suppose for the time being that, on average, the money demand function is at $\overline{M}_0^d$. Consequently, we ignore the short-run unpredictability in money demand. If money supply is controlled within the $M^S_{max}$ and $M^S_{min}$ range, then interest rates will fluctuate between $R_{min}$ and $R_{max}$. Note, however, that if money demand is steeper, as in $\overline{M}_1^d$, interest rates become potentially more volatile as the range $[R'_{max}, R_{min}]$ is larger than $[R_{max}, R_{min}]$. If the central bank wants to limit interest rate volatility then, in principle, it could tighten the range of values taken by the money supply (proving this result is left to you as an exercise). As we already know, tightening the range is easier said than done and, despite the fact that the European Central Bank for one has a **money supply growth target**, this approach has lost its appeal among many academics.[8]

**Figure 23.3 Money Supply Targeting**

**(A) Money Supply Targetting When the Slope of the Money Supply Changes**




**(B) Money Supply Targeting and Money Demand Uncertainty**




Panel (A) illustrates how changing the slope of the money demand function affects the variability of interest rates for a given range of money supply values. Interest rate volatility is greater the more inelastic (i.e., the steeper) is money demand. In panel (B), interest rate variability is caused by uncertainty about the position of the money demand function.

8 See B. Bernanke, and F.S. Mishkin, "Central Bank Behavior and the Strategy of Monetary Policy: Observations from Six Industrial Countries," *NBER Macroeconomics Annual* 1992 (Cambridge, Mass.: The MIT Press, 1992): 183–227, and L.E.O. Svensson, "Monetary Policy Issues for the Eurosystem," Carnegie–Rochester Conference Series on Public Policy, 51 (1) (1999): 79–136. Laidler cautions that policymakers ignore information in money supply data at their peril, although different monetary aggregates send different messages about the future course of inflation and economic growth. See D.E.W. Laidler, "Passive Money, Active Money, and Monetary Policy," *Bank of Canada Review* (Summer 1999): 15–25, and P.L. Siklos, and A.G. Barton, "Monetary Aggregates as Indicators of Economic Activity in Canada: Empirical Evidence," *Canadian Journal of Economics* (February 2001): 1–17.

Now consider the case shown in panel (B) of Figure 23.3. Suppose that, on average, the money supply curve is at $\overline{M}_0^S$, but the central bank must cope with an uncertain money demand that ranges from $M^d{}_{\min}$ to $M^d{}_{\max}$. Even if the monetary authorities stay the course, interest rates will range between $R_{\max}$ and $R_{\min}$. The more uncertain is money demand (i.e., the larger is $u$), the more volatile interest rates will be (this, too, is left as an exercise).

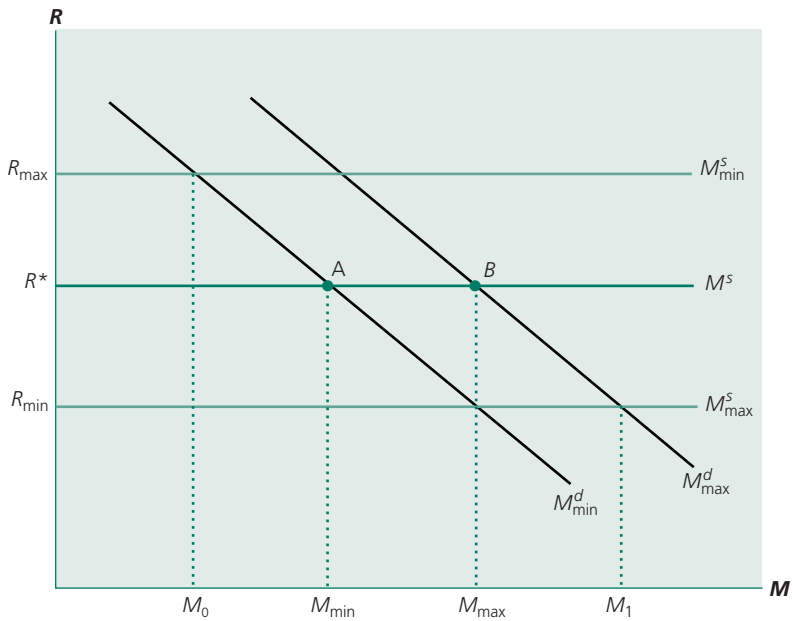
If interest rate uncertainty is considered inherently undesirable because it creates uncertainty about the consistency of monetary policy actions or makes it more difficult for investors to make decisions, then a cautious central bank might be inclined to implement a policy in which interest rates are controlled or at least change slowly over time.

## INTEREST RATE PEGGING

Check out the role of money growth targets at the European Central Bank **www.ecb.int**

Suppose that instead of trying to control the money supply, a central bank decided to peg interest rates. In the extreme, it might simply decree that the interest rate be set at $R^*$ in Figure 23.4. Equilibrium money supply values would range between $M_{\min}$ and $M_{\max}$. More realistically (because no central bank completely controls the money supply), it might allow interest rates to fluctuate freely within a band, denoted as in the figure as $R_{\min}$ to $R_{\max}$. Then the equilibrium money supply values would range between $M_0$ and $M_1$. Notice that the effect of pegging the interest rate is to render the money supply curve perfectly elastic.[9] The reason is that a central bank that is pegging interest rates has undertaken to supply quantities of money sufficient to ensure that the interest rate stays within the designated bands. Indeed, the Bank of Canada officially an-

**Figure 23.4 Interest Rate Pegging**




If the central bank pegs the interest rate at $R^*$, the equilibrium money supply will fluctuate between $M_{\min}$ and $M_{\max}$, consistent with equilibrium points $A$ and $B$. In other words, the money supply function becomes perfectly elastic. Alternatively, the central bank may intervene only if there are indications that the interest rate will rise above $R_{\max}$ or fall below $R_{\min}$. The variation of the equilibrium money supply is held to $M_0$ and $M_1$.

9 Except within the interest rate target zone, if such a zone exists.

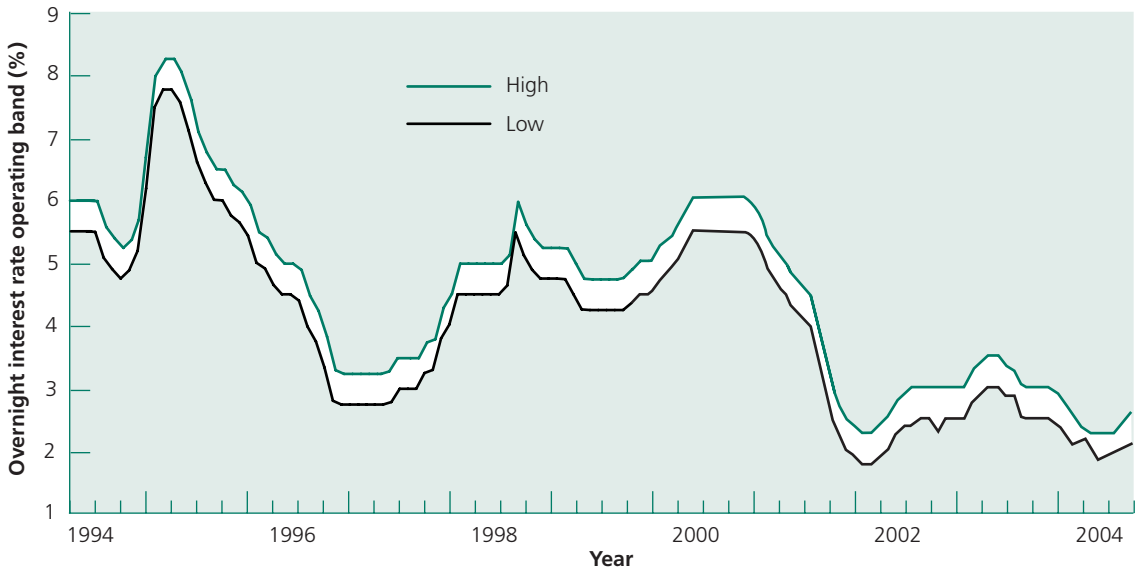
nounces a target band for overnight interest rates, one of its main tools of monetary policy (see Chapter 4).

## CONTROLLING THE MONEY SUPPLY OR INTEREST RATES?

Which of the two control techniques is superior? Is it preferable to minimize fluctuations in the money supply over time, or would the Bank be better off pegging interest rates?

As we have seen, two problems face policymakers. One is the relative sizes of $u$ and $v$, that is, the disturbances to the money demand and money supply functions. It is therefore important for central banks to forecast these disturbances. The second is the uncertainty about the slope of the money demand and supply curves, which complicates matters further.[10] Whether the interest rate is pegged at $R^*$, or is allowed to fluctuate between $R_{min}$ and $R_{max}$, Figure 23.4 shows that the money supply becomes volatile. Considerable evidence exists that central banks prefer interest rate stability over money supply stability, for reasons already discussed. As a result, the interest rates they directly control change slowly and gradually.[11] Figure 23.5 shows the operating band for the overnight rate. The actual overnight rate, as we have seen earlier (Chapters 4 and 22), always fluctuates within the band. Since this instrument was introduced, we have seen a sharp rise in the target interest rate in late 1994 and early in 1995, as fears of resurgent inflation in the United States pushed the Fed funds rate sharply higher around the same time. Notice that the overnight rates fell back slowly, reaching early 1994 levels more than a year later. As inflation fears subsided, interest rates continued to fall until the Asian crisis hit the world economy. The crisis had a strong impact on the U.S.–Canadian dollar exchange rate, and therefore Canadian interest rates, throughout the summer

**Figure 23.5** **The Overnight Rate Band in Canada**




*Source:* Adapted from Statistics Canada, CANSIM II database, series V39076 (Low) and V39077 (High).

10 Indeed, in another classic article, Brainard shows that central bank forecasting exercises no longer produce the "optimal" outcome when policymakers are unsure about the slopes of these functions. See W. Brainard, "Uncertainty and the Effectiveness of Policy," *American Economic Review* 57 (May 1967): 411–25.

11 This is known as the interest rate "smoothing" principle. See M. Goodfriend, "Interest Rates and the Conduct of Monetary Policy," *Carnegie-Rochester Conference Series on Public Policy* 34 (1991): 7–30, and C.A.E. Goodhart, "Central Bankers and Uncertainty," *Bank of England Quarterly Bulletin* 39 (February 1999): 102–14.

of 1998.[12] After the crisis, interest rates came down only slowly as inflation fears reappeared, in the face of strong economic growth in both the United States and Canada, as the world economy overcame the Asian flu.

Finally, the meltdown of the stock market in 2000–2001, resulting from fears that technology stocks were overvalued, the imminent arrival, or so it was thought, of a severe recession, as well as the repercussions of the events of 9/11, led to a sharp fall in 2001. As this is written, the bias has once again turned toward rising future short-term rates since fears of a persistent slowdown eased considerably in early 2002.

The discussion so far has focused on using the interest rate or the money supply as the instruments of monetary policy. What about the exchange rate? Recall that in Canada's postwar monetary history, the exchange rate has been allowed to float more or less freely. Hence, the exchange rate is not an instrument of policy. Does this mean that the exchange rate does not matter? Clearly not, for Canada's is a small, open economy, and external influences loom large on the domestic economy. However, we saw as early as in Chapter 8 that in a floating exchange rate system this determines the evolution of the relationship between Canadian and foreign, most notably, U.S. interest rates. Consequently, the Bank of Canada and financial markets are keenly interested in the link between domestic interest rates, the exchange rate, and what this means for the state of monetary policy. We consider below a simple indicator of that relationship, but one that can be fraught with problems if misused.

## WHY SMOOTH INTEREST RATES?

Figure 23.5 makes clear that interest rates change slowly, and that central banks do not react immediately to every blip in inflation or exchange rates. Thus, for example, during the fall of 2004, the Bank of Canada predicted strong economic growth for 2005. However, as the exchange rate began to appreciate very rapidly, the Bank began to have second thoughts about the impact on Canadian businesses highly dependent on exports to the U.S. Therefore, although the Bank at first expected to raise its target for the overnight interest rate, it changed course once new data showed their initial views were too optimistic. "Recent data suggest that Canada's economic growth in the fourth quarter of 2004 was marginally weaker than previously expected, owing partly to a somewhat more pronounced adjustment to the past appreciation of the Canadian dollar."[13] This quote suggests a couple of things. First, the exchange rate does matter, even though the Bank does not attempt to control its course. We explore the implications of this view below. The second implication is that central banks are cautious when changing interest rates.[14] Why? Economists point to a number of factors that explain this kind of behaviour:

1. Forecasts are uncertain and subject to change. Therefore, central banks have to be cautious about their outlook for the economy.
2. Central bankers worry about their reputation. If they increase interest rates quickly and then reverse course, the public might think they are not terribly competent.
3. Frequent interest rate changes can be costly for banks, businesses, and the public, since they require a variety of adjustments, from portfolio reallocation, to the setting of different lending and borrowing rates, to the costs of operating a business.

12 Notice also that interest rate developments in 1998 are broadly consistent with the view that the Bank of Canada does not target the exchange rate (details are left as an exercise), though it might use foreign exchange intervention to dampen exchange rate volatility, that is, by "leaning against the wind." Indeed, Bank of Canada researchers reached the same conclusion by analyzing a longer period of data. See J. Murray, M. Zelmer, and D. McManus, "The Effect of Intervention on Canadian Dollar Volatility," in *Exchange Rates and Monetary Policy*, proceedings of a conference held by the Bank of Canada (Ottawa, Ont.: Bank of Canada, 1996): 311–61.

13 From **http://www.bankofcanada.ca/en/fixed-dates/2005/rate_25015.htm**

14 Many have recently written about the interest rate-smoothing phenomenon. See, for example, B. Sack and V. Wieland "Interest Rate Smoothing and Optimal Monetary Policy: A Review of Recent Empirical Evidence," *Journal of Economics and Business* 52: 205-28.

4. As long as a central bank is credible, it can change expectations of future inflation by simply threatening to change interest rates without actually doing so. The result should show up in the term spread (as discussed in Chapter 7).

Not everyone agrees with this assessment. Some argue that plots such as Figure 23.5 are an illusion stemming in part from looking at data over long periods such as a quarter or even a year.[15] Still another study argues that, once we control for the fact that central bank decisions today affect the economy, and inflation in particular, several months in the future, it appears that there is interest rate smoothing when an inflation-targeting central bank acts aggressively to ensure that inflation remains within the stipulated target.[16] Nevertheless, the evidence seems to suggest that central banks do smooth interest rates, and some central bankers have admitted so explicitly.[17]

## THE MONETARY CONDITIONS INDEX

The Bank of Canada's MCI **www.bankofcanada.ca/en/backgrounders/bg-p3.html**

Trying to divine what a central bank does preoccupies economists and financial market participants. Any piece of financial or economic news that might affect the interest-rate-setting behaviour of the central bank is the subject of intense scrutiny and analysis. This is particularly true in the United States, where the regular meetings of the Federal Reserve Open Market Committee (FOMC) have the media guessing about the direction of interest rates. Of course, given our economic and financial ties to the United States, the Bank of Canada is not immune to Fed moves.

Canada's is a small open economy, and so interest rate movements may not always clearly signal the present stance of monetary policy. In part for this reason, the Bank of Canada has developed what it calls the **Monetary Conditions Index** (**MCI**). The MCI is best thought of as a judicious combination of interest rate movements and exchange rate movements.[18] The actual formula used by the Bank of Canada is

$$\text{MCI} = (R_t - 7.90) + (100/3)\,[\log \text{C6} - \log (91.33)]$$

where $R$ is the 90-day yield on commercial paper, C6 is the Canadian dollar index against its major trading partners (U.S., E.M.U. countries, Japan, U.K., Switzerland, and Sweden), 7.90% is the corporate paper rate in January 1987, and 91.33 is the exchange rate against the C6 in the same month. As can be seen from the definition, the MCI is a combination of interest rate movements relative to some benchmark (7.90%), as well as exchange rate movements, again relative to some benchmark (91.33). The objective of the equation is to ask whether, relative to these benchmarks (these were chosen because the index takes on a value of zero in January 1987), monetary policy is tighter or looser. An interest rate rise or a depreciation of the currency anticipates higher future inflation. Therefore, a higher MCI signals tighter monetary policy. Recall from Chapter 8 that the two variables are linked to each other via the interest rate and purchasing power parity theories. In the current setup, interest rate movements account for approximately two-thirds of movements

15 G. Rudebusch "Term Structure Evidence on Interest Rate Smoothing and Monetary Policy Inertia," *Journal of Monetary Economics* 49: 1161-87.

16 C. Goodhart "The Monetary Policy Committee's Reaction Function: An Exercise in Estimation," *Berkeley Electronic Press* (forthcoming 2005).

17 W.B. English, W.R. Nelson, and B. Sack "Interpreting the Significance of the Lagged Interest Rate in Estimated Monetary Policy Rules," *Contributions to Macroeconomics* 3(1), 2003, article 5; B. Sack "Does the Fed Act Gradually? A VAR Analysis," *Journal of Monetary Economics* 46 (August 1998): 229-56. Ben Bernanke, a former governor of the U.S. Federal Reserve, explains why central banks change interest rates gradually in "Gradualism," remarks at an economics luncheon cosponsored by the Federal Reserve Bank of San Francisco and the University of Washington, 20 May 2004, available from **www.federalreserve.gov**.

18 For more details about the MCI, see C. Freedman, "The Role of Monetary Conditions and the Monetary Conditions Index in the Conduct of Policy," *Bank of Canada Review* (Autumn 1995): 53–60, and C. Freedman, "The Use of Indicators and of the Monetary Conditions Index in Canada," in *Frameworks for Monetary Stability: Policy Issues and Country Experiences,* edited by T.J.T. Baliño and C. Cottarelli (Washington, D.C.: International Monetary Fund, 1994).

in the MCI. By following movements in the MCI, the Bank attempts to create monetary conditions that follow as closely as possible a path consistent with its inflation target objective.

The Canadian dollar depreciated strongly against the U.S. dollar beginning in the summer of 1998, and there was a great deal of confusion about whether the Bank of Canada was content with MCI levels, which were dropping, prompting the Bank to raise interest rates. In doing so, the Bank appeared to contradict its own stated policy of not trying to "...maintain a precise MCI level by adjusting interest rates in response to every exchange rate wiggle."[19]

Other central banks, such as New Zealand's Reserve Bank, have also used an MCI to assist in evaluating what the appropriate stance of monetary policy should be. The IMF too has used the MCI in describing the stance of monetary policy in selected countries. Despite the usefulness of the MCI (the Bank of Canada continues to publish the index) as a tool to understand the connection between interest rate and exchange rate changes, it has fallen out of favour because markets can easily become confused about the importance a central bank places on exchange rate changes versus changes in interest rates.[20] An inflation-targeting central bank must allow the exchange rate to float freely, as we saw earlier (for example, as in Chapter 22), and so cannot be seen as playing interest rate changes against changes in the exchange rate. In any event, most observers agree that central banks are incapable of influencing the level of the exchange rate, except temporarily, although they have far more influence on interest rate levels.

## 23.3 CENTRAL BANK AUTONOMY AND INFLATION

If it is one of the central bank's responsibilities to achieve some final target such as price stability, it must be permitted to do so without political interference. However, we can never entirely omit a role for politicians. After all, their electoral fortunes will be influenced by prevailing economic conditions, which are at least partly the fruit of the central bank's actions, and politicians directly control the tools of fiscal policy, which also influence the economy. In this section, we look at each of these temptations to interfere with the central bank. Finally, we consider the evidence on **central bank autonomy**, or **independence**, and inflation control (also see the discussion of Bank of Canada history in the previous chapter).

The price of autonomy, however, is greater accountability and transparency. This means that, since central bankers are not elected, they must ultimately be held accountable for their actions to the government and the public. In part for this reason, central banks have provided more information about what they are doing and how they expect to act in future, including the provision of information about their outlook. Therefore, we also briefly discuss the concepts of transparency and accountability.

### THE POLITICAL BUSINESS CYCLE

An only slightly cynical view of the inherent tension between a government and a central bank is that it produces cycles in economic activity that can be linked to election dates. This **political business cycle** argument presumes that politicians can and ultimately will attempt to manipulate economic aggregates, such as inflation, unemployment, and economic growth.

The United States, where elections are held on a regular schedule, provided the early testing ground for this theory. Critics objected that politicians could not possibly fool voters all of the time, and the political business cycle concept fell out of favour in economic circles for a time. Alternatively, if political parties are ideologically motivated, economic cycles may reflect partisan preferences over

19 Bank of Canada, *Monetary Policy Report* (May 1995): 14.

20 For an explanation of some of the dangers of relying on an MCI-type measure, see P.L. Siklos, "Is the MCI a Useful Signal of Monetary Conditions? An Empirical Investigation," *International Finance* 3 (November 2000).

time; for example, "conservative" governments may gear their policies so as to achieve a relatively low rate of inflation, whereas their "liberal" counterparts may prefer to focus on reducing unemployment. In addition, the timing of elections in many countries, including Canada, is uncertain. Governments in such countries may try to avoid losing a vote by selecting an election date prior to any anticipated recession.

Much of the work on political business cycles assumes that governments tend to resort to monetary policy to generate outcomes favourable to re-election. The reason is that, unlike fiscal policies, whose implementation can involve considerable delays (legislative, among others), monetary policies can be put in place fairly quickly. But this view presumes that government directly controls monetary policy—in other words, that central banks have no possibility of independent action. Thus, say proponents of political business cycles, if a central bank is pursuing a policy of price stability in the midst of a recession and an election looms, that bank will likely have to abandon its action at the behest of its political masters.

Is there empirical evidence favouring the political business cycle theory? The very nature of the argument makes it difficult to prove, in part because it is not so easy for politicians to manipulate monetary policy at will.

Consider four aggregates that might be influenced by political considerations: the unemployment rate, interest rates, the exchange rate, and economic growth. Unemployment in Canada has tended to fall just before an election. By contrast, interest rates rose before at least half the elections. More often than not, the exchange rate also rose (meaning a more expensive U.S. dollar in Canadian terms).[21] Finally, average real GDP growth has tended to peak before an election (though the timing has been variable). Thus, there is, at least superficially, some evidence that economic cycles are influenced by electoral events.[22]

## COMPATIBLE FISCAL POLICY

Even if the political business cycle is not operating, and a country otherwise wants its central bank to be independent, the institution can be severely hampered if its monetary policy is inconsistent with the government's **fiscal policy** (that is, its use of its taxing and spending powers). Thus, fiscal policy can result in inflation even if monetary policy is geared to prevent it. The conflict between the two sets of policies is one reason economies show a distinct bias toward some inflation. (We explored this point and other issues in the debate about the importance of money in Chapter 21.)

## THE RECORD ON INFLATION CONTROL

Clearly, a central bank in a democracy cannot be entirely independent of the political system since the voters invest ultimate responsibility for economic performance in their elected officials. Moreover, the well-known tendency of central banks to shroud their actions in secrecy (a feature that is disappearing), and the complexities of understanding what the future holds for the economy as a whole, make it even more difficult to ascertain what they actually do and how much their actions differ from those of the political authorities.[23] Yet, it is now generally recognized that maintaining accountability is simplified by permitting central banks to focus on the goal of price

21 Canada was on a fixed exchange rate regime during the 1963, 1965, and 1968 elections. Some argue that the use of monetary policy to achieve political ends is more likely under flexible exchange rates than under fixed exchange rates.

22 One might also wonder: Since central banks are more independent, could they create their own political business cycle? After all, some argue that the first President Bush lost the election because of Alan Greenspan, the chair of the U.S. Federal Reserve. Available international evidence suggests that central banks cannot be blamed for such cycles. See E. Leertouwer, and P. Maier, "Who Creates Political Business Cycles? (Should Central Banks Be Blamed?)," *European Journal of Political Economy* 17 (September 2001): 445–63.

23 Indeed the "bureaucratic theory" of central bank actions argues that the Bank of Canada acts in its own self-interest as opposed to pursuing some economic objectives.

stability, rather than by selecting some other variable from the available "menu" (see Figure 23.1).[24] This development is most vividly reflected in the growing number of countries that have adopted inflation targets (see Chapter 22). Futhermore, a positive byproduct of price stability is increased stability in economic performance, with all its attendant benefits for unemployment rates.

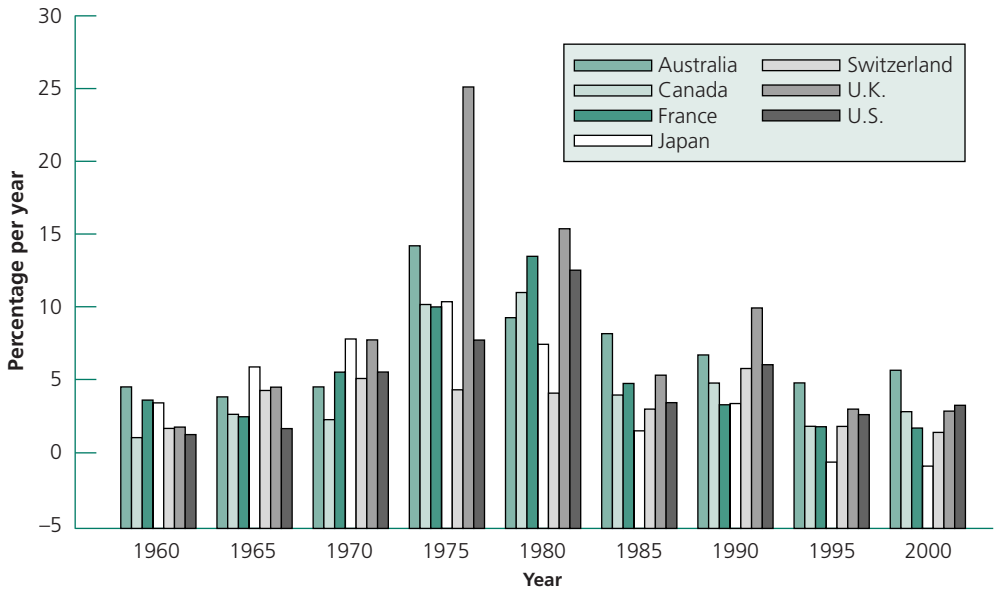
There is increasing recognition that countries with low inflation tend to outperform other countries in terms of economic growth. Perhaps for this reason, many countries are now trying to stabilize prices. Figure 23.6 shows the evolution of inflation rates in seven countries over 40 years. In the early 1970s, their inflation rates diverged considerably. But stagflation taught even politicians to dislike inflation, and by the 1980s the rates were beginning to converge.

All this evidence on the desirability of price stability led policymakers in the 1990s to favour making it the primary goal of central banks and enshrining some form of autonomy for these institutions to counter the political temptation to inflate the economy before an election. Germany, Austria, Switzerland, and, more recently, New Zealand, Canada, the United Kingdom, Japan, and a few other countries (see Chapter 22), now mandate that their central banks maintain some form of price stability.[25] A legislated goal of price stability is also mandated for the newly established European Central Bank of the European Union (see Chapter 26).

## EVALUATING CENTRAL BANK INDEPENDENCE

How convincing is the evidence linking, in particular, inflation and the degree to which a central bank is autonomous or independent? First, there is the problem of defining what is meant by

**Figure 23.6 Inflation Rates over Time in Selected Industrialized Countries**




*Source:* International Financial Statistics CD-ROM (Washington: International Monetary Fund). Data refer to the year-over-year percentage change in each country's consumer price index at five-year intervals.

24 The governor of the New Zealand central bank must achieve precise price stability objectives or face the possibility of dismissal.

25 Many economic studies find that a central bank's statutory independence is of considerable importance in determining its inflation performance. Yet, the record of countries where such independence exists suggests otherwise in several instances. For an alternative view, see D.R. Johnson, and P.L. Siklos, "Political and Economic Determinants of Interest Rate Behaviour: International Evidence," *Economic Inquiry* (October 1996), for empirical evidence that suggests that statutory independence, although important, is not a sufficient condition for achieving low inflation.

independence. It surely does not mean that a central bank can do whatever it pleases. Rather, the term independence, or autonomy, refers to whether a central bank has instrument versus goal independence.[26] That is, can the central bank choose the instruments of monetary policy freely? Or are the goals of monetary policy specifically mandated? In countries such as New Zealand, there is no goal independence because the central bank is mandated to achieve a specific inflation target. By contrast, there is instrument independence because the Reserve Bank of New Zealand can use whatever means it has at its disposal to achieve the stated inflation target. In Canada's case, the inflation targets are not mandated by legislation but rather by mutual agreement between the finance minister and the governor of the Bank of Canada. As we have seen, however, the Bank of Canada's mandate is currently very broad, so it has both goal independence and instrument independence. But, since the Bank has been operating under an inflation targeting regime since 1990, goal independence no longer effectively exists.

How is independence measured? Economists have generally adopted two approaches. One, very popular of late, is to rank central banks according to some interpretation of their statutes.[27] One such exercise divides central bank laws into the following categories (the list that follows is a partial one).

1. *Monetary policy formulation*. Here the object is to determine who decides the formulation of monetary policy: the central bank or the government.
2. *Conflict resolution*. Here the issue is how disagreements between the government and the central bank are resolved. Does the governor have to resign? As we have seen in the Canadian case, this proved to be an important question in connection with the Coyne affair.
3. *Central bank objectives*. How precisely defined are the objectives of the central bank? In other words, how much goal independence is there?
4. *Term of office*. For how long is the governor appointed? Does the term coincide with or overlap the term of the politicians who head the government?
5. *Limitations on lending to government*. How difficult is it to borrow from the central bank, that is, to effectively monetize the debt (see Chapter 26)?

Table 23.1 shows four such rankings. Four of the five rankings use information about central bank legislation applicable during the 1980s or earlier. Siklos updates Cukierman's ranking for the 1990s. It is immediately clear that Switzerland and the United States generally lead the pack and, as Figure 23.6 also reveals, these same two countries often have the lowest inflation rates. However, there are two major criticisms levelled at this approach. First, how is it that the same piece of legislation leads to such different rankings? A good example is the Bank of Japan. Its inflation performance is among the best, but it ranks near the bottom in three of the four rankings and near the top in only one. Why? Because, in legal terms the Bank of Japan was, until 1997, subservient to the Finance Ministry. What made it effectively independent was the autonomy of the Finance Ministry from the rest of government. A second problem is that legislation governing central banks changes very infrequently. Thus, for example, both the Bank of Japan and the Banque de France became statutorily much more autonomous toward the end of the 1990s, and this is not reflected in the rankings. On the other hand, developments in New Zealand have catapulted New Zealand from near the bottom of the earlier rankings to near the top, while the newly created European Central Bank leads the pack. Another objection is that it may be more important for a central bank to have a clear mandate to keep inflation under control via an inflation target than to provide autonomy in the statutes of the central bank. By contrast, as is clear from Figure 23.6, inflation performance over the last 30 years has changed dramatically. One reason is

26 See S. Fisher, "Modern Central Banking," in *The Future of Central Banking*, edited by F. Capie, C. Goodhart, S. Fischer, and N. Schnadt (Cambridge: Cambridge University Press, 1994).

27 See A. Cukierman, *Central Bank Strategy, Credibility and Independence* (Cambridge, Mass.: The MIT Press, 1992).

**Table 23.1 Qualitative Rankings of Central Bank Independence**

| Cukierman (1980s) | Grilli et al. (1980s) | Burdekin and Willett (1980s) | Parkin (1980s) | Siklos (1990s) |
|---|---|---|---|---|
| Switzerland | Germany | Germany | Germany | European Central Bank |
| Germany | Switzerland | Switzerland | Switzerland | New Zealand |
| Austria | United States | Austria | United States | Switzerland |
| United States | The Netherlands | United States | Japan | Germany |
| Denmark | Canada | Canada | Denmark | Austria |
| Canada | Italy | The Netherlands | Canada | United Kingdom |
| The Netherlands | Austria | United Kingdom | The Netherlands | United States |
| Ireland | Denmark | Australia | United Kingdom | Denmark |
| Luxembourg | Ireland | France | France | Sweden |
| Iceland | Australia | New Zealand | Sweden | Canada |
| Britain | New Zealand | Sweden | Italy | Netherlands |
| Australia | France | Italy | Belgium | Ireland |
| France | United Kingdom | Belgium | Australia | Japan |
| Sweden | Belgium | Japan | New Zealand | Australia |
| Finland | Japan | Denmark | Austria | France |
| New Zealand | Sweden | Ireland | Ireland | Finland |
| Italy | Norway | Norway | Norway | Italy |

*Source:* A. Cukierman, *Central Bank Strategy, Credibility, and Independence* (Cambridge, Mass.: The MIT Press, 1992), Table 19.4; V. Grilli, D. Masciandaro, and G. Tabellini "Political and Monetary Institutions and Public Financial Policies in Industrial Countries," *Economic Policy* (October 1991): 342–92; R.C.K. Burdekin, and T.D. Willett, "Central Bank Reform: The Federal Reserve in International Perspective," *Public Budgeting and Financial Management* (1991): 619–50; M. Parkin, "Domestic Monetary Institutions and Deficits," in *Deficits*, edited by M.G. Porter (Clayton, Australia: Monash University, 1986): 24–39; P.L. Siklos, *The Changing Face of Central Banking* (Cambridge: Cambridge University Press, 2002), Table 2.7.

Learn more about central banks in industrial countries at **www.wlu.ca/~wwwsbe/faculty/psiklos/centralbanks.htm**

the exchange rate regime. As we have seen (in Chapter 8), a country's inflation rate is dependent on whether the exchange rate is fixed or not. The reason, therefore, that inflation rates were comparable in the 1960s was that exchange rates were more or less tied to the U.S. dollar. After the oil shock of 1973–74, exchange rates became flexible and inflation rates began to differ considerably between countries. Although exchange rates remained flexible into the 1990s, more and more central banks began to view inflation as an evil, and all began to aim for lower inflation, which explains the convergence of inflation rates in the early 1990s.

Another objection to the rankings tabulated in Table 23.1 is that they assume a causal relationship between the degree of statutory independence and inflation performance. Instead, it may be more plausible to argue that if the public and the financial sector are simply opposed to inflation, the central bank will deliver low inflation, regardless of the statutes spelling out its objectives. Otherwise, how could we explain the record of low inflation in the United States and in Germany, where price stability is understood to be the objective of the respective countries' central banks, even though neither institution is mandated to achieve a numerical inflation objective?

## CENTRAL BANK ACCOUNTABILITY AND TRANSPARENCY

Accountability in monetary policy goes hand in hand with greater transparency. A central bank that is required to achieve an inflation objective is expected, or may be required, to account for its actions once the government has set the objective, preferably with the agreement of the monetary authority. Some have suggested that, as in New Zealand, the employment contract of the head of the central bank should include a performance clause tied to inflation performance (see **Economics Focus 23.2 – A Contract for Central Bankers?**). One worry with such a proposal is that a central bank governor might want to keep inflation low regardless of the economic consequences. In the extreme, inflation might stay low even though there was an economic depression. In practice, of course, this would not likely happen, since the political pressure to take account of real economic activity would be too great for any central banker—even one with an inflation performance clause—to ignore. Transparency, therefore, helps the central bank build

credibility. As the governor of the Bank of Canada publicly stated, the trust that is acquired through greater transparency "can be thought of as a kind of social capital—a shared asset that benefits everyone, including the central bank."[28]

Transparency and accountability are often seen as complementing each other. One problem is that there is no consensus yet on the precise meaning of both terms. Theoretical approaches and implications of accountability and transparency in central banking also are varied. For example, Siklos (2002) defines accountability to include the precision with which the goals of monetary policy are outlined.[29] Transparency, on the other hand, is determined by the quantity, type, and clarity of information provided to the public. In other words, "transparency plays the part of self-imposed commitment: by disclosing the basis of the policy decisions, the central bank enables the general public to assess their adequacy."[30] Table 23.2 provides a chronology of changes in accountability and transparency at the Bank of Canada since 1991.

The definition of price stability has attracted relatively more controversy in academic circles. The literature has reached a broad consensus: Price stability does not mean zero inflation (see **Economics Focus 23.3 – Why Zero Inflation?**). Instead, a 1-3% inflation range is believed to be approximately consistent with price stability. One aspect of the controversy concerns whether inflation defined on the basis of core inflation enhances transparency. Monitoring core inflation requires that the central bank draw attention to the distinction between aggregate demand and supply shocks (see Chapter 21). The reason is that not all shocks require an interest rate response or need threaten a breach in the inflation target. For example, an oil price increase is bound to be inflationary. However, unless businesses use this as an excuse to permanently increase prices and, thus, inflation, the central bank will accommodate the immediate effect of these shocks, but will not permit inflation expectations to increase permanently. However, this distinction may be lost on the public who may not much care for such subtleties, instead equating loss of purchasing power with movements in the overall CPI (often referred to as headline CPI). Indeed, labour contracts, either explicitly or implicitly, are negotiated with future changes in CPI in mind, not core inflation. So long as core and CPI inflation move closely together it is not clear that inflation targets in terms of core inflation improve transparency. If, however, the two inflation measures diverged from each other, this would complicate the communications problem facing the central bank.[31]

## REACTION FUNCTIONS AND MONETARY POLICY RULES

Check out information about central bank statutes, objectives, and other pertinent information **www.bis.org/cbanks.htm**

A second approach to the analysis of central bank behaviour consists of estimating what are called *reaction functions*. These are basically equations that are supposed to model what central banks actually do. To take a simple example, let's assume that the central bank conducts policy by changing the interest rate. One way we can distinguish between central banks then is to examine how they might react to inflation, unemployment, or electoral pressures. A central bank that cares only about inflation would attach a zero coefficient to increases in unemployment. By contrast, a central bank could choose to respond only to unemployment changes and not at all to inflation. Of course, an intermediate case occurs when the central bank responds to both inflation and unemployment changes. In addition, a politically motivated central bank would also respond to political pressure in the form of elections and partisan changes in government (i.e., from Liberal to Conservative). Finally, a central bank such as the Bank of Canada can ill afford to conduct an

28 Dodge, D. "Trust, Transparency, and Financial Markets," Remarks of the governor of the Bank of Canada to the Greater Halifax Partnership, 11 June 2002, available at **www.bankofcanada.ca/en/speeches/**.

29 Siklos, P.L. *The Changing Face of Central Banking: Evolutionary Trends Since World War II* (Cambridge: Cambridge University Press, 2002).

30 Deutsche Bundesbank, "Monetary Policy Transparency," *Monthly Report* 52 (March 2000): 15-30.

31 See Laidler, D.E.W., and Aba, S. "It's Time to Ignore Core Inflation," *C.D. Howe Institute Backgrounder* 45, November 2000. The authors raise doubts about the focus on core inflation in the Bank of Canada objectives. It is interesting to note that at least one *Monetary Policy Report* (Bank of Canada 2003 April) devotes considerable space to explaining why core and headline inflation have diverged from each other roughly since 2000.

**Table 23.2 Changes in the Bank of Canada's Accountability and Transparency, 1988-2004: A Chronology**

| Dates | Nature of Change/Announcement |
|---|---|
| January 8, 1988 | Governor Crow's Hanson Memorial Lecture advocating the goal of price stability |
| February 6, 1991 | Announcement of inflation control targets in the federal government's budget speech (2-4% range in the CPI by the end of 1992, 1.5-3.5% by mid-1994 (revised to 1-3% in December 1993, renewed in 1995 (3 years), 1998 (3 years), and 2001 (6 years). |
| May 3, 1995 (first) | Monetary Policy (inflation) Reports since 1995. Beginning in 2000, quarterly updates were issued. |
| April 15, 1994 | Band and target for overnight interest rates |
| October 28, 1996 | Midpoint of band targeted by the Bank |
| April 12, 1995 | New foreign exchange market intervention guidelines announced |
| July 1998 | Foreign exchange market interventions to be announced on the Web site |
| September 19, 2000 | Fixed dates for announcing changes to the Bank rate |
| May 17, 2001 | Renewal of 1-3% inflation target for 5 years. Clarification of core inflation as the operational guide for monetary policy. |
| 2003 | Indicators of capacity and inflation pressure in Canada |
| 2004 | Published business outlook survey |

*Sources:* Adapted from P. Siklos "Assessing the Impact of Changes in Transparency and Accountability at the Bank of Canada," *Canadian Public Policy* XXIX (September 2003): 279-99, and updated from various Bank of Canada publications.

exclusively "made in Canada" interest rate policy (look back at the Mexican peso case considered in Chapter 8 to see why). Therefore, domestic interest rate changes will also be influenced by foreign interest rate developments. A simple way to summarize the above relationships is with the help of the following equation:

$$\Delta R_t = a_0 + a_1 \Delta U_{t-1} + a_2 \Delta \pi_{t-1} + a_3 POL_t + a_4 \Delta R_{t-1}^{US} \qquad \textbf{(23.1)}$$

Equation (23.1) says that a change in the interest rate (say the Treasury bill rate) is a function of the previous experience with unemployment, measured as a change in the unemployment rate from last period (usually a month because unemployment data are released on a monthly basis), last period's inflation rate, a "political variable" (for example, whether there was an election or a change in government that month), and whether there was a change in interest rates in the United States. The relative importance of each consideration is evaluated by estimating the size of the coefficients $a_0$ to $a_4$. This approach to measuring what central banks do comes to a different conclusion than the approach that focuses on the legislative mandate of a central bank. In particular, it appears that central banks are more alike than they appear based on measures of statutory independence. Certainly, a look at the inflation performance of several countries reveals this as a definite possibility (see Figure 23.6). Furthermore, central banks behave quite differently according to whether exchange rates are pegged or not.[32]

The fact that central banks in the industrial world either have statutory independence or effectively operate autonomously from government has rekindled the possibility that central banks should operate according to some rule. A rule is, to quote the prominent monetary economist Allan Meltzer, "nothing more than a systematic decision process that uses information in

32 See D.R. Johnson, and P.L. Siklos, "Political and Economic Determinants of Central Bank Behaviour: Are Central Banks Different?" *Economic Inquiry* (October 1996).

## ECONOMICS FOCUS 23.2 A CONTRACT FOR CENTRAL BANKERS?

It was pointed out in this chapter and the previous one that governments have been searching for ways to ensure low inflation performance and to avoid the temptations of using the central bank to exploit the short-run Phillips curve. One solution that has received considerable attention among economists is to have the central bank governor's contract tied to inflation performance. The New Zealand case comes to mind, of course, since the central bank's budget is nominally fixed, and the governor can be dismissed if inflation exceeds the agreed upper portion of the target band. Yet, it seems impractical to follow up on such a suggestion if only because, even in the private sector, contracts tied strictly to performance alone are extremely rare. Nevertheless, it is interesting to consider why such contracts might help solve the time-inconsistency problem discussed in this chapter. Consider a model of the economy described by the following equations:

$$U = U_n + (\pi - \pi^e) \quad [a]$$
$$W^{SOC} = (U_n - U) - b\pi \quad [b]$$
$$W^{CB} = \text{sal} + (U_n - [U + k])^2 - b\pi^2 \quad [c]$$

Equation [a] describes the natural rate hypothesis in terms of inflation. Thus, if inflation is higher than expected then, other things being equal, actual unemployment is lower than the natural rate. Equation [b] is society's welfare function (*soc*). Again, any inflation reduces social welfare. Finally, equation [c] is the welfare function of the central bank (CB), which is partly a function of the salary of the governor (sal). Notice that the central bank can tolerate a different level of unemployment than society (by an amount $k$ assumed to be constant). The solution to the problem of maximizing welfare, when $k$ cannot be zero, is the following (we leave the details as an exercise)

$$\pi = k/b \text{ and } U = U_n$$

which is simply the inflation bias result that was derived earlier (see equation [23.8]). Suppose, however, that to avoid the inflation bias, the governor of the central bank signs a performance contract that looks like the following:

$$\text{sal} = \text{sal}_o - \lambda\pi \quad [d]$$

where $\text{sal}_o$ is a base salary and $\lambda$ is some fraction of inflation performance that reduces the governor's salary. The maximization problem in this case reduces to (again leaving the problem as an exercise)

$$\pi = (k - \lambda)/b,\ U = U_n \quad [e]$$

Notice from equation [e] that as long as $\lambda$ is greater than zero, inflation with a performance contract will be *lower* than without a contract, and the unemployment rate will not be the same. This fact is the essence of the proposal that central bank governors should sign performance contracts.

### Questions for Discussion

1. What is a performance contract for a central banker meant to accomplish? Why is such a thing perhaps impractical?
2. Does the belief in a short-run Phillips curve play a role in arguing against a contract for central bankers?

### Sources

C. Waller, "Performance Contracts for Central Bankers," *Review of the Federal Reserve Bank of Saint Louis* 77 (Sept/Oct 1995): 3–14.

C. Walsh, "Recent Central Bank Reforms and the Role of Price Stability as the Sole Objective of Monetary Policy," *NBER Macroeconomics Annual* 1995 (Cambridge, Mass.: The MIT Press, 1995): 237–52.

a consistent and predictable manner."[33] The idea is not a new one, since Nobel Laureate Milton Friedman advocated a fixed money growth rule to ensure stable inflation.

The latest incarnation of monetary policy rules proposes that central banks set interest rates according to the following equation:

$$R_t = \bar{\pi} + 0.5\,(\bar{\pi} - \pi^*) + 0.5\,(y_t - \bar{y}_t) + \bar{\rho} \quad \textbf{(23.2)}$$

where $\bar{\pi}$ is the average inflation rate, $\pi^*$ is a target for inflation (formal or informal), and $(y_t - \bar{y}_t)$ is the output gap, that is, the percentage difference between actual and potential real GDP. The coefficient 0.5 indicates that for a one unit (or percent) increase in desired or targeted inflation or the output gap, the central bank should respond by increasing the interest rate by 0.5%.

33 Allan H. Meltzer, "Commentary: The Role of Judgment and Discretion in the Conduct of Monetary Policy," in *Changing Capital Markets: Implications for Monetary Policy*, Federal Reserve Bank of Kansas City (1993): 223.

## ECONOMICS FOCUS 23.3 WHY ZERO INFLATION?

In 1988, the then–new governor of the Bank of Canada, John Crow, proposed that the Bank's goal be zero inflation. "Monetary policy should be conducted as to achieve a pace of monetary expansion that promotes stability in the value of money. This means pursuing a policy aimed at achieving and maintaining stable prices," he said (*Bank of Canada Review* [February 1988]: 4).

The policy of zero inflation raised considerable comment both in the press and among academics. What are the benefits of zero inflation? Some academics contend that the certainty of future price level stability would be beneficial to the economy. Others argue that the biases in the measurement of prices (see Chapter 6) preclude zero inflation as a practical target. For Canada, estimates suggest that actual CPI inflation overstates the "true" inflation rate by a maximum of 0.5%. One recent estimate for the U.S. economy suggests the net benefits of a zero inflation environment are positive. Much of the debate centred not on whether zero inflation was desirable, but whether it was feasible. Lucas explained that regional diversity would make the zero inflation goal difficult to achieve in Canada. Moreover, he pointed out that the Bank of Canada has little credibility in reaching its stated goal. Johnson pointed out that there were fundamental inconsistencies between the federal government's fiscal policy, with its distinct bias toward inflation, and the Bank of Canada's professed desire to eliminate inflation entirely. So much debate was sparked by the Bank of Canada's objective that the C.D. Howe Institute sponsored two conferences and several volumes summarizing the various views on the subject, as did the Bank of Canada.

By the time former Finance Minister Michael Wilson brought down his budget in February 1991, however, the government had formally abandoned any pretence of wanting zero inflation, announcing objectives of 3% by the end of 1992 and 2% by 1995 in the core rate of inflation.

The core rate of inflation measures the rate of change in the consumer price index, excluding food and energy costs. One argument for this omission in evaluating the severity of inflation is that food and energy prices are significantly determined by aggregate supply considerations, which are determined by events such as bad weather, wars, or the oil price policies of OPEC (Organization of Petroleum Exporting Countries). Such costs cannot be influenced directly by the government's fiscal and monetary policies, which act on the aggregate demand side of the economy. The Bank of Canada argues, however, that the omission is due to "the volatile nature of food and energy prices" (*Bank of Canada Review* [September 1991]: 3). Yet, it also says that "since 1979 they (food and energy prices) have exhibited no pronounced tendency to rise or fall on a sustained basis relative to prices of other goods and services" (*Bank of Canada Review* [September 1991]: 4).

Until the economy recovered from the recession, there was considerable controversy over the costs of reducing inflation. Some analysts, such as Pierre Fortin, argued that the Bank of Canada's "obsession" with low inflation triggered a sharp recession in the early 1990s. However, other analysts pointed out a number of flaws in Fortin's analysis.

### Questions for Discussion

1. Should the Bank of Canada aim for zero or low inflation?
2. Does fiscal policy play a role in the inflation process?

### Sources

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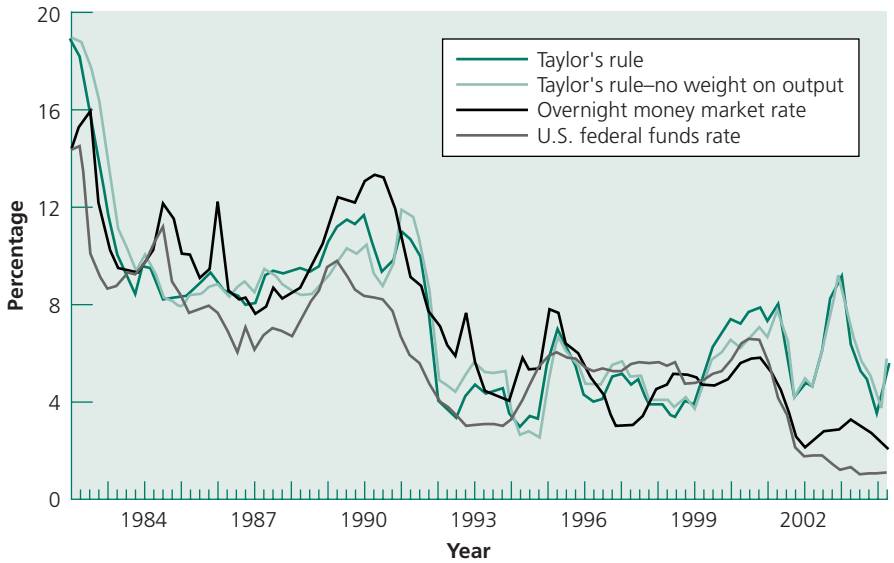
Notice, therefore, that equation (23.2) assigns equal weight to the inflation and output GDP gaps, reflecting the belief that a central bank ought to be concerned not only about inflation but about the performance of the real economy as well. Finally, $\rho$ is the average real interest rate.

Although the research so far on the viability of rules such as the one introduced in equation (23.2)—also known as Taylor's rule[34]—is promising, more research is needed. Why? Notice that Taylor's rule leaves out a role for monetary aggregates, or its desire to smooth interest rate fluctuations[35] and other pieces of information that might be relevant to an open economy such as Canada's.[36] Also, there is no way of directly observing the actual weights assigned to inflation or to the output gap by central bankers, nor does there appear to be any consensus on what they should be.

Figure 23.7 illustrates how Taylor's rule might operate in the Canadian context. We see that although policy was not as tight in the early 1980s, as Taylor's rule recommends, there is a long period, from about 1983 to 1996, when actual policy was almost always too tight, again relative to Taylor's rule. Nevertheless, the two curves agree fairly closely with each other, suggesting that such a rule might be a promising avenue for implementing monetary policy in the future.

Indeed, one might imagine equation (23.2) as being used to determine how much weight a particular central bank might place on inflation developments to the exclusion of all else. Lars Svensson, a well-known economist who studies central banks and how they practise policy, has pointed out that, in his opinion, and contrary to the views of some, no central bank cares only about

**Figure 23.7 Taylor's Rule for Canada**




Taylor's rule is found by applying equation (23.2) when $R$ is the overnight market interest rate, $\pi$ is the four-quarter moving average of CPI inflation, $\pi^*$ is 2%, as assumed by Taylor, and $\rho$ is 3.5% (which is the assumption made about the real interest rate; see Chapter 5). The variable $(y_t - \bar{y}_t)$ is found by taking the percentage difference between the log of Canada's real GDP and an estimate of the trend of the log of the same series.

*Source:* Adapted from Statistics Canada, CANSIM II database **www.cansim2.statcan.ca/cgi-win/CNSMCGI.EXE**, series V1992067 (real GDP 1999$), V122514 [overnight money market rate (7 days)], V122150 (U.S. Federal funds rate), and V18702611 (CPI, 1992=100).

34 See J.B. Taylor, "Discretion versus Rules in Practice," *Carnegie-Rochester Conference on Public Policy* (December 1993): 1267–86.

35 As noted earlier, this practice may be central to how central banks actually conduct monetary policy. See S. Collins and P.L. Siklos, "Optimal Monetary Policy Rules and Inflation Targets: Are Australia, Canada, and New Zealand Different from the U.S?," *Open Economies Review*, 15 (October 2004): 347–62.

36 A less well-known version of equation (26.2), where the left-hand side is the growth rate of the monetary base (see Chapter 2), also exists and is called McCallum's rule.

inflation. In other words, no central bank practises "strict inflation targeting."[37] Such central banks, called "inflation nutters" by one of the deputy-governors of the Bank of England,[38] simply cannot describe how any monetary authority actually makes interest rate decisions. Interestingly, if one compares predictions from the Taylor rule where $(y_t - \bar{y}_t) = 0$ against the version shown in equation (23.2), there is little difference between them, suggesting that central banks don't really care about economic activity generally. However, this is misleading for two reasons. First, as discussed earlier, central banks change interest rates slowly and this is not captured in equation (23.2). Although there are many reasons for this kind of behaviour, one is that central banks do not want to rush to judgment about the impact of their decisions on overall economic growth. Second, it is easy to discuss in theory the concept of the output gap. However, in practice, it is very difficult to measure output. We saw this in Chapter 6 (**Economics Focus 6.2 Measuring Real GDP**). In addition, it is unclear how to measure potential GDP. Lastly, even if economists could agree on how to measure $(y_t - \bar{y}_t)$, the fact is that the required data come in slowly and are subject to several revisions. Therefore, since central banks have to make decisions in real time, there may be perfectly good reasons to underemphasize the output gap term, while underlining the fact that it is an important consideration in making decisions about what the stance of monetary policy ought to be at any given moment.[39] Instead, it is likely that central banks in the industrial world practise a form of "flexible inflation targeting," a policy that recognizes that a central bank that is democratically accountable to its citizens must also be sensitive to overall economic performance, not just the rate of inflation.

Finally, Figure 23.7 also shows the evolution of the U.S. Fed funds rate to illustrate the fact that, although U.S. and Canadian interest rates broadly move together, the relationship is not a lock-step one. We can thank the system of floating exchange rates for that.

## SUMMARY

- Central banking is an art because it requires the manipulation of instruments to achieve multiple and sometimes conflicting targets, and because it requires central bankers to fend off interference from politicians and the public.
- Central banks can choose from a menu of instruments, such as open market operations, SPRAs, and the manipulation of the bank rate. The aim is to achieve an intermediate target, such as steady interest rates, that is closely related to some final target, such as low inflation and unemployment.
- This chapter presents a simple model according to which the central bank must choose manipulation of either a monetary aggregate or an interest rate as its instrument. The one that is not the tool becomes the intermediate target. The better instrument depends on whether the central bank prefers interest rate variability over money supply variability.
- Central banks today prefer an interest rate instrument because they tend to prefer interest rate stability over stability in the growth of some monetary aggregate.

37 L.E.O. Svensson, "Inflation Targeting in an Open Economy: Strict or Flexible Inflation Targeting," Public lecture held at the Victoria University of Wellington, New Zealand, *Victoria Economic Commentaries*, 15(1) (March 1998).

38 M. King, "Changes in UK Monetary Policy: Rules, Discretion in Practice," *Journal of Monetary Economics* 39 (June 1999): 81–97.

39 As a result, what appear to have been bad monetary policy decisions turn out to have been based on faulty GDP data. Hence, central banks have been stressing the need to focus on other indicators that give a relatively more reliable assessment of GDP performance, while remaining keenly aware of the importance of real economic performance in setting interest rates. See A. Orphanides and S. van Norden "The Unreliability of Output-Gap Estimates in Real Time," *Review of Economics and Statistics* 84 (November 2002): 569-83; and A. Orphanides. "Monetary Policy Rules Based on Real Time Data," *American Economic Review* 91 (September 2001): 964-85.

- In Canada, the interest rate on overnight loans is the principal instrument of monetary policy.
- An alternative way of interpreting the study of monetary policy in an open economy such as Canada's is to monitor the Monetary Conditions Index (MCI). The MCI is a weighted average of interest rates and exchange rates.
- A rise in the MCI signals tighter monetary policy, while a fall means looser monetary policy. A problem of interpretation arises with the MCI because it is an index. Therefore, tightness or looseness of policy is relative to the chosen base period, which may or may not always be appropriate.
- Many economists believe that key goals of monetary policy, such as inflation, output, unemployment, or the exchange rate, are subject to political influence and result in political business cycles.
- A topic of considerable interest and importance is how much independent action a central bank should be permitted. There appears to be a connection between inflation, economic performance, and the degree to which a central bank is statutorily independent.
- Attempts to evaluate central bank independence follow two distinct lines: Some believe there is a connection between inflation and the statutory relationship between a central bank and government; others examine how key economic variables such as inflation and unemployment interact with interest rate developments. The latter approach is called the reaction function approach.
- Although central banks around the world have become more independent, they have obtained their additional responsibilities by becoming more accountable to government and to the public, as well as more transparent about their operations.
- Central banks nowadays seem to follow a rule of sorts in setting interest rates known as Taylor's rule.
- Taylor's rule suggests that central banks respond to inflation and output developments and try to keep real interest rates more or less constant.
- The lessons from applying Taylor's rule are as follows: good monetary policy means that real interest rates will rise temporarily to dampen inflation expectations; bad monetary policy means allowing the real interest rates to fall when inflation rises.

## IMPORTANT TERMS

central bank autonomy or independence, 474
fiscal policy, 475
interest rate control, 468
interest rate pegging, 470
intermediate targets, 465
Monetary Conditions Index (MCI), 473
monetary control, 468
money supply growth target, 469
operating instruments, 465
political business cycle, 474
price stability, 466
ultimate goals, 465

## PROBLEMS

1. Assume that the money supply curve is perfectly inelastic and subject to complete control by the central bank. Draw the appropriate liquidity preference diagram. Would interest rate stability disappear? What about money supply instability? Why?
2. True, false, or uncertain: The more elastic the demand for money, the greater the variability of equilibrium money supply fluctuations when interest rate pegging is in effect. Illustrate, using a liquidity preference diagram, and explain your answer.
3. Figure 23.4 illustrates a case in which interest rate control is the best instrument. Use a similar diagram to illustrate a case in which the best instrument is one that relies on money supply control.

4. Suppose the Bank of Canada wants to minimize interest rate variability. What is the best instrument of monetary policy? Illustrate, using a diagram, and explain.
5. Using Figure 23.3(A), show how tighter money supply control reduces interest rate variability.
6. Using Figure 23.3(B), show how greater money demand uncertainty increases interest rate variability.
7. Explain, using interest rate parity arguments, why interest rate developments shown in Figure 23.4 are consistent with the Bank of Canada not targeting the exchange rate.
8. Explain how a rise in the MCI signals tighter monetary policy.
9. What would Taylor's rule look like if:
   (a) the central bank did not care about the output gap
   (b) the central bank did not care about inflation
10. Suppose desired inflation is 2%, average inflation is 4%, and the real interest rate is 3%. Using equation (23.2), what is the interest rate when the output gap is +2%? –2%?
11. In the above question, suppose that the interest rate is 6% when the output gap is –2% and 8% when the output gap is +2%. What is the central bank's desired inflation rate in each case?
12. Draw a diagram with the interest rate on the vertical axis and inflation on the horizontal axis. Use a curve to illustrate the following cases:
    (a) a central bank that is neutral with respect to the real interest rate
    (b) a central bank that is aggressively raising interest rates in the face of higher inflation
    (c) a central bank that responds softly to an increase in inflation in terms of its interest-rate-setting behaviour

## DISCUSSION QUESTIONS

1. Give an example and explain why there may be conflict between
   (a) intermediate targets
   (b) final targets
2. Do you think that the financial innovations of the past decade have made monetary policy more or less controllable by the Bank of Canada? Explain your answer. (Hint: See Chapter 4.)
3. What are the disadvantages of having a central bank satisfy multiple final targets? To whom are they disadvantages? Could these disadvantages be advantages to others? Explain your answer.
4. Discuss the pros and cons of achieving monetary stability and interest rate stability.
5. Why do you think politicians would rely less on monetary policy under fixed exchange rates than under flexible exchange rates? (Hint: See Chapter 8.)
6. What is meant by the term *central bank autonomy*?
7. Is the connection between inflation in the countries depicted in Figure 23.6 and the rankings in Table 23.1 a close one? Why or why not?
8. What is the difference between goal independence and instrument independence?
9. Why have several countries come to conclude that central banks should target inflation?
10. Central banks have come to fear a loss of control over monetary policy in recent years. Why?

11. Why might using an inflation forecast as an intermediate target be inappropriate? Explain.
12. Why do central bankers find it difficult to change interest rates frequently? Explain.
13. Explain how the public's or financial markets' attitudes toward inflation might limit the central bank's ability to generate inflation. What might be the source of their dislike of inflation?
14. Explain why granting more central bank autonomy gives rise to a demand for greater accountability and transparency from the central bank.
15. Would you agree that the developments listed in Table 23.2 are consistent with the Bank of Canada becoming more accountable and transparent? Give an example of each and explain how the objectives of greater accountability and transparency are met.

## ONLINE APPLICATION

Go to the Bank of Canada's Web site at **www.bankofcanada.ca/en**. Click on *Research and Publications*, and then on *General Publications*. Find the *Weekly Financial Statistics* and find the data for the MCI. Interpret the movements in the MCI. What does the Bank of Canada have to say about the behaviour of this index? Check out earlier editions (prior to 2004) of the *Monetary Policy Report* and examine the Bank's discussion about MCI movements.

## CANSIM QUESTION

1. Go to the CANSIM Web site and download the data series listed in Figure 23.7. Try to recreate the figure using the assumptions listed in the caption to the figure. Remember that to calculate the output gap, you need to take the logarithm of real GDP. For trend real GDP, assume that it grows 3.5% per year from the fourth quarter of 1979. What if trend real GDP grows at 2.5%?
2. Go to the CANSIM Web site and download the following series: the seasonally adjusted unemployment rate (V2062856), the Bank Rate (V39078), and the U.S.–Canadian dollar exchange rate (V37426). Download the data at the quarterly frequency, using data averaged over the quarter. Next, obtain election dates from the Elections Canada Web site **http://www.elections.ca/home.asp?textonly=false**. Plot the series and indicate the election dates and whether a Liberal or a Conservative won the election. Is an electoral cycle apparent? Is a partisan cycle apparent?

**References can be found on www.mcgrawhill.ca/college/siklos**