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## Monetary Policy in the 1990s: Lessons and Challenges

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### Introduction

In recent years there has been considerable discussion of various national and international financial developments, which, it is argued, have had or will have important implications for the way monetary policy is conducted. The most prominent of these developments can be captured under the rubrics of **liberalization and globalization**. They include such matters as the abolition of exchange and capital controls, a range of financial innovations brought about by regulatory or market changes that have made monetary aggregates less **stable**, and the move of some countries toward a **fixed** exchange rate regime.

In this paper I take both a backward and forward look at the formulation of monetary policy. The next section provides a broad overview of the principal lessons for the conduct of monetary policy that can be drawn from the experiences of the past two decades. The following section traces out some of the likely challenges to monetary policy in the coming decade, in particular the implications of liberalization and globalization. There is, of course, some considerable overlap between past changes and future developments.

One set of broad conclusions is worth highlighting in this **introduc-**

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\*The views expressed in this paper are those of the author and do not necessarily reflect those of the **Bank** of Canada. The author is indebted to a **number** of his colleagues at the Bank for comments and criticisms of earlier drafts of this paper. Any remaining errors are, of course, his own responsibility.

tion. For those countries in which monetary policy has in the past operated principally through market mechanisms (that is, changes in interest rates **and/or** the exchange rate), the 1990s will not differ in any truly fundamental sense from the past two decades as far as the conduct of monetary policy is concerned. Of course, there will be changes. For example, the role of intermediate targets may be different, and the relative importance of interest rates and exchange rates as transmission channels may change. But, basically, the central banks in such countries will likely conduct monetary policy in the 1990s in a relatively similar way to the way they have been conducting policy in the 1980s. In contrast, for those countries which relied upon quantitative controls and credit rationing in the past, changes have been and will be much more fundamental. With the removal of restrictions on markets and on market participants and with the abolition of exchange controls, quantitative credit controls will no longer be feasible. Hence, policy will have to operate through changes in interest rates and exchange rates, as in the first group of countries. A **final** set of countries will have the most radical changes of all. These are the countries which opt for a fixed exchange rate **vis-à-vis** a larger partner or as part of a currency bloc. In a world without exchange controls and in which asset substitutability is high, such countries are relinquishing their monetary policy role to their larger partner or to the central bank of the currency area. In return, they receive the long-run inflation rate and credibility of the latter. Thus the relevance of the judgments and conclusions in this paper to a specific country will depend on the institutions that have prevailed in that country as well as the choice it makes with respect to exchange rate regime.

The approach that is taken in this paper to these issues is primarily practical, rather than theoretical, and the focus is upon the major problems that central banks have faced and will be facing. It is not intended to be an exhaustive treatment, but rather a broad-brush survey. The model underlying most of the analysis is what I would call the mainstream central bank model of recent years—best characterized as a structural model with an aggregate demand for goods equation, a money demand equation, and an augmented Phillips curve equation with no **tradeoff** in the long run but in which wages or prices are responsive to conditions in the labor or goods markets in the short run. Of particular importance is the fact that **expecta-**

tions in the mainstream model are typically a mix of the backward-looking (that is, adaptive) and forward-looking varieties.<sup>1</sup> In short, the model is basically one in which markets do not continuously clear (that is, there is wage **and/or** price stickiness in the short **run** although not in the long run) and in which expectations are, at most, partly **rational**.<sup>2</sup> I will also follow what I interpret as the mainstream central bank approach to the transmission mechanism, in which monetary policy (in the absence of credit and exchange controls) operates through changes in interest rates and other rates of return, and through changes in the exchange rate when the latter is permitted to move.

A final point by way of introduction. Since much of my own expertise has been in the area of Canadian monetary policy, I will draw heavily on the experiences over the last two decades of the Canadian economy—a quintessential relatively small open economy with very high international asset substitutability, no **capital** controls, flexible exchange rate, no interest rate ceilings, and no credit rationing. Because of the openness of the Canadian economy and the absence of controls over a long period of time, the Canadian economy may well serve as a useful laboratory for what is likely to happen in those countries whose markets are becoming more liberalized and more global. I also make frequent reference to developments in the U.S. economy over the last two decades, notably in terms of the responses to the abolition of interest rate ceilings, and in relation to the interaction between fiscal and monetary policy.

## **Lessons from the 1970s and 1980s**

In beginning a retrospective of the lessons that can be drawn from the experiences of the past two decades it is perhaps worth recalling very briefly the nature of the policy views that dominated the

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<sup>1</sup> Models, such as those of Taylor (1980), which incorporate staggered wage contracts and rational expectations can give similar results to models with some backward-looking expectations. Nonetheless, I would characterize the mainstream central bank approach as including an element of backward-looking expectations.

<sup>2</sup> In addition to the full rational expectations market-clearing model, I also leave aside the real business cycle theories and new Keynesian approaches to cyclical fluctuations. The real business cycle theories are surveyed in Plosser (1989) and Mankiw (1989), and the new Keynesian approaches are set out in Ball, Mankiw, and Romer (1988), and Greenwald and Stiglitz (1988).

economics profession and central banks in the 1960s. A listing of the goals of policy at this period would make prominent mention of both the level of output and employment and the rate of inflation. It was felt that one could achieve a reasonable outcome for these variables as well as stabilize real incomes by targeting on a real variable such as real output growth or the rate of unemployment. That is, when real output growth fell and the rate of unemployment rose, fiscal and monetary policies would be moved in the direction of expansion, and when the rate of unemployment fell and the rate of inflation rose policies would shift in the direction of contraction.<sup>3</sup> With hindsight it is clear that the attempt to “fine tune” the real economy and to achieve what turned out to be unrealistically low rates of unemployment was overly ambitious and beyond the capacity of central banks and **governments**.<sup>4</sup> In the event, the combination in the early 1970s of the pressures of worldwide excess aggregate demand and of supply shocks led to a long-lasting inflation situation, unprecedented in the peacetime history of industrialized countries, which is still influencing behavior.

The following list sets out what I consider to be the principal lessons for monetary policy that can be drawn from the experience of the 1970s and 1980s.

- (1) Monetary policy should take a longer-term perspective and focus on one or more nominal quantity variables or the nominal exchange rate, and not on real variables or interest rates.
- (2) Inflation expectations become entrenched over time and very difficult to eliminate. **Hence**, in the face of demand pressures, it is important to take timely action to prevent inflation from accelerating or at least to limit the upward movement.
- (3) Somewhat less emphasis should be placed on monetary **and/or** credit aggregates than in the past. They can continue

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<sup>3</sup> Indeed, in the most ambitious versions of this approach the authorities were expected to adjust policy in response to projected movements of unemployment and inflation.

<sup>4</sup> Furthermore, those who believed in a long-run tradeoff between the unemployment rate and the rate of inflation found their beliefs disproved by the events of the late 1960s and 1970s.

to make a useful contribution to policy but in a world of innovation may not be able to serve as formal intermediate targets.

(4) In an economy that is subject to periodic, significant shocks in its terms of trade, movements in the nominal exchange rate can facilitate adjustments in the economy.

(5) When fiscal policy and monetary policy are working in opposite directions, very **large** movements in financial variables, such as the nominal and real exchange rate and nominal and real interest rates, may result.

(6) There is no simple way of dealing with unfavorable supply shocks.

Each of these points will now be considered in detail.

***(1) Monetary policy should take a longer-term perspective and focus on one' or more nominal quantity variables or the nominal exchange rate, and not on real variables or interest rates.***

This is, perhaps, the principal lesson to be drawn from the experience of the 1970s. The implications of focusing on real variables can be seen in the events of the period and in the mainstream model. Targeting on, say, the unemployment rate can be very risky since one can never be sure of the magnitude of the nonaccelerating inflation rate of unemployment (NAIRU), and trying to achieve and maintain a level of unemployment which is below the NAIRU will lead to an accelerating rate of inflation. The risks are particularly great when the NAIRU is changing as a result of such factors as changes in minimum wage laws, modifications in the regulations governing unemployment insurance, or demographic shifts.<sup>5</sup>

By focusing on a nominal quantity variable, the authorities can avoid cumulative one-way errors which result in outcomes such as **ever-**increasing inflation. Excessively rapid growth in demand (whether caused by an internal or external demand shock) causes the nominal variable on which the central bank is focusing to expand at a rate

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<sup>5</sup> Rose (1988), Carlson (1988), and Weiner (1986).

greater than desired. In the case of an economy operating under flexible exchange rates, the result will be a rise in interest rates and an appreciation of the domestic currency, both of which will operate to moderate the expansion of nominal spending. Conversely, in a situation with excessively slow growth in spending, there will be a tendency for interest rates to decline and the domestic currency to depreciate, both of which will tend to provide support to spending. In both cases, the transmission mechanism operates from central bank adjustments in its balance sheet through interest rates, exchange rates and their associated effects, to output and prices.

Considerable research over the years has gone into the question of whether the authorities should place most weight on a monetary aggregate or a credit aggregate or nominal spending or the nominal exchange **rate**.<sup>6</sup> Much of the earlier literature emphasized the monetary aggregates and the debate centered on issues such as the choice between narrow and broad aggregates, the degree of stability of demand for money equations, and reduced-form linkages between money and nominal spending. Recently, somewhat more attention has been paid to the potential role of credit in the conduct of monetary policy<sup>7</sup> and, especially, to the possibility of nominal spending playing the role of intermediate target or focus of **policy**.<sup>8</sup>

In terms of formal models a strong case can be made for placing most emphasis on nominal spending or, what is more or less equivalent, on a monetary aggregate with low interest rate elasticity and a fairly stable relationship with nominal spending. Indeed, some have urged that the authorities formally target on nominal spending. In addition to ensuring a favorable long-run outcome, nominal spending rules appear to **avoid** excessive cyclical movements of the economy following demand shocks. However, a number of good, practical reasons have been offered for not going so far as to target on nominal **spending**.<sup>9</sup> These include concerns about the quality and timeliness of nominal spending data, the relative roles of central banks and governments in taking responsibility for nominal spending, and the

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<sup>6</sup> See Longworth and Poloz (1986) and the articles cited therein, as well as Alogoskoufis (1989).

<sup>7</sup> B. Friedman (1982), Bernanke and Blinder (1988).

<sup>8</sup> Tobin (1980), Gordon (1985a), McCallum (1985).

<sup>9</sup> Ando and others (1985). pp. 6-9.

inability of the authorities to achieve such targets with any precision in the short to medium run. In any case, even if the authorities choose not to target on nominal spending for the above or other reasons, it is clear that nominal spending is a variable to which considerable attention should be paid. After all, it is only by getting the growth of nominal spending in the economy down to noninflationary rates that inflation can be eliminated from **the economy**.

At the other end of the spectrum is targeting on a nominal exchange rate or a basket of nominal exchange rates. This is a viable approach for a small country that is prepared to accept the rate of inflation that is achieved by the large country, or the average rate of inflation of the group of countries, to which it is linking its currency. However, consideration of the type of shock to which a country is likely to be subject is very important in deciding whether to fix the exchange rate or to opt for a floating currency. For example, the periodic shocks in the world prices of raw materials vis-à-vis those of manufactured goods would provide a strong argument for a small raw materials producer not to tie its currency to that of a large manufacturing country. Indeed, one of the adjustment mechanisms for the small raw materials producer is via the movements in the real exchange rate and, therefore, fixing or constraining the nominal exchange rate may hamper adjustment in such circumstances. I will return to these issues in later sections of this paper.

## *(2) The stubbornness of inflationary expectations and the importance of a timely response to aggregate demand shocks,*

One of the more important features of the experiences of the 1970s was the difficulty in bringing down the rate of inflation once the public came to expect that the inflationary process would continue unabated. The lesson to be drawn is the importance of taking timely action to prevent inflation from accelerating, because of the high costs of getting it down after inflationary expectations become entrenched.

The stubbornness of inflationary expectations in the 1970s and 1980s can be **interpreted** in two quite distinct ways. Those who believe the rational expectations, flexible-price model reach the conclusion that central banks never tried seriously to get the rate of inflation down in the 1970s and that the public was right to expect inflation to persist, given the rates of growth of the monetary aggregates. And

when central banks did finally act in the early 1980s, they tightened up too abruptly so that the unanticipated sharp reduction in money growth led to the most severe recession of the postwar period.

An alternative interpretation of the events of the period follows the mainstream model and places much more emphasis on the backward-looking nature of inflationary expectations. In this view, the public responds much more to actual rates of inflation than to rates of growth of the money supply in establishing its inflation expectations. Some slowing of output growth will typically precede any deceleration of inflation, and the public comes to believe in a lower rate of inflation in the future only when the actual inflation rate is seen to **decline**.<sup>10</sup> Thus, the lower rate of growth of money is associated with higher interest rates and an appreciated domestic currency, both of which lead to a slowing of spending and to a decline in both the actual and expected rate of inflation."

An intermediate view places a considerable amount of emphasis on the credibility of the central bank.<sup>12</sup> The simplest version of the credibility argument can be posed in two ways. First, we can think of the short-run Phillip's curve as developing a steeper slope at rates of unemployment above the NAIRU and a flatter slope at rates of unemployment below the NAIRU. That is, the public becomes so convinced that the authorities are going to act to force down the rate of inflation that they respond more than otherwise to signs of slowing in the economy and less than otherwise to signs of strengthening. An alternative and more common way of thinking about the older version of the credibility effect is to have inflation expectations being driven off variables such as the growth of monetary aggregates or pronouncements of the authorities and not just the actual behavior of inflation. Thus, in the Fellner-type view, the authorities may initially have to slow demand growth considerably to set off the process of inflation deceleration. However, once they convince the public

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<sup>10</sup> In this connection it is worth noting the argument that the rate of disinflation of the early 1980s in the United States was consistent with the augmented Phillips curves estimated in the second half of the 1970s. See Gordon (1985b) and B. Friedman (1988b).

<sup>11</sup> A similar conclusion would be reached in the context of the overlapping multiperiod contract model.

<sup>12</sup> Fellner (1979).

that they are serious about their objectives, less slack than otherwise would have been the case is needed to achieve a further deceleration, and the difficulty of achieving a disinflation is considerably less than suggested by the simplest mainstream model (although still more than in the simple rational expectations model).

The earlier literature did not devote much attention to how central banks can achieve credibility. A more recent literature tries, typically in the context of the flexible-price rational expectations model, to explain why inflation has persisted, to examine whether there are ways of **precommitting** the central bank to noninflationary outcomes, and to analyze the way in which reputation is developed and maintained.<sup>13</sup>

The main insight to be drawn from both the older and newer strands of the literature is the importance of central bank credibility in helping to bring about a decline in the rate of inflation or preventing an increase. For example, the greater the degree of credibility, the more willing is the public to treat expansionary demand shocks as temporary and hence, the easier is the task of the central bank in preventing a rise in the rate of inflation. Similarly, one or a series of upward movements in the price level that are caused by special factors are more likely to be treated as temporary blips in inflation (or more accurately, as changes in the price level rather than in the rate of inflation) and not as harbingers of an upward ratchet in the rate of inflation. They are, therefore, less likely to become entrenched in a wage-price spiral.

There are no simple or magic ways of achieving credibility. Ongoing vigilance and action by the central bank in response to inflationary pressures are necessary to develop and retain such a reputation. Over time, a central bank that is credible will be able to prevent inflation from re-igniting with much less difficulty than one that has not developed the reputation of credibility and hence, central bank credibility serves as a public good for the economy.

### **(3) *The changing role of monetary and credit aggregates.***

Although at no time did central banks place sole reliance on the

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<sup>13</sup> Barro and Gordon (1983), Blackburn and Christensen (1989).

monetary aggregates as the guide to policy, the 1970s saw greater use of them as formal targets than either the previous or subsequent period. In part, this was the result of the extremely difficult inflation problem that dominated the period; in part, it related to the **perceived stability** of the demand for monetary aggregates, and of reduced-form equations which related the growth of nominal spending to the growth of a monetary aggregate as well as to other variables. On the basis of an enormous amount of empirical work on monetary aggregates, central banks in much of the industrialized world chose during this period to target formally on such measures.

Even during this “**golden period**” there were signs of problems with the aggregates in a number of countries. In the United States, there was considerable discussion of the case of the “missing money.”<sup>14</sup> In Canada, a similar episode in 1976-77 resulted in policy for a time being somewhat easier than had been **intended**.<sup>15</sup> And in the United Kingdom, the demand for the £M3 equation began to break down in the early 1970s although the leading indicator property of £M3 *vis-à-vis* inflation made it the favored variable until further problems developed in the late 1970s and the **1980s**.<sup>16</sup>

In addition to the broad question of the stability of the money demand or reduced-form equation, which was considered a necessary condition for monetary targeting, other problems also began to be apparent by the end of the 1970s. For those countries which were targeting on a very interest-elastic monetary aggregate, there was a concern that in the face of an expansionary shock a rise in nominal interest rates might be sufficient to hold a narrow monetary aggregate on target and yet might not be sufficient to slow nominal spending.” And, a related point, during a period of disinflation focus on an interest-elastic monetary aggregate would result in the so-called re-entry problem. This is a situation in which a falling rate of inflation and falling nominal interest rates lead to a sharp transitory increase in the rate of growth of the nominal aggregate in order to **accom-**

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<sup>14</sup> Goldfeld (1976).

<sup>15</sup> Thiessen (1983).

<sup>16</sup> Goodhart (1986).

<sup>17</sup> Thiessen (1983) and Crow (1988).

**moderate** the increased demand for real money **balances**.<sup>18</sup> The temporary rapid growth in the monetary aggregate over this period would result in credibility problems for the central bank to the extent that it was **misunderstood** or that there was a concern that the authorities would allow the rapid growth to go on too long.<sup>19</sup> Countries targeting on broader aggregates, which are less interest elastic, **would** tend to be less affected by these issues than those targeting on narrow aggregates.

The more serious problems of instability in monetary aggregates began in the late 1970s and early 1980s. In the United States, deregulation of interest rates and the introduction of new accounts resulted in an extended period of unstable demand for the narrow aggregates. In Canada, the source of the instability during this period was not related to changes in regulations since interest rates **had** been largely unregulated since 1967. Rather, the interaction of technology and various market forces, including unprecedentedly high interest rates, led to the introduction and spread of new types of accounts and new techniques of investing idle balances in order to achieve higher rates of **return**.<sup>20</sup> As a result of such developments, **M1** was dropped as a target in Canada in 1982, and in the United States, emphasis shifted to the broader monetary aggregates and, for a time, **credit**,<sup>21</sup> with **M1** playing a much less important role.

The experience in the United States provided a good example of the importance of financial deregulation in destabilizing a particular aggregate, one which had **previously been** the most stable. The Canadian experience showed that even an economy which had long since deregulated its interest rates would not necessarily be immune to financial innovation, with the potential for deterioration in the stability of some of the aggregates in a world of rapid change. It is the latter lesson that is the more important since it indicates the possibility of continuing instability even after economies have absorbed all the effects of deregulation of interest rates. I return to the implications of this lesson for monetary policy in the 1990s in a subsequent section of this paper.

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<sup>18</sup> Freedman (1981), Simpson (1984).

<sup>19</sup> M. Friedman (1985).

<sup>20</sup> Freedman (1983).

<sup>21</sup> The relationship of credit to nominal spending also became unstable later in the 1980s. See B. Friedman (1988b).

*(4) In an economy that is subject to periodic significant shocks in its terms of trade, movements in the nominal exchange rate can facilitate adjustments in the economy.*

Small countries that are subject to periodic movements in the relative prices of their exports have to cope with adjustment problems following such price changes. For example, there can be significant distributional effects, both industrial and regional. Furthermore, in the case of a terms of trade gain that flows from an export price increase the outcome in the long run must be a real appreciation of the domestic currency. Indeed, the real appreciation is part of the mechanism whereby the gains to producers of the commodity whose price has risen become generalized throughout the economy. However, whether the real appreciation occurs via a nominal appreciation or via a rise in domestic wages and prices, with the nominal exchange rate unchanged, is largely a function of domestic policy. Attempts to hold the nominal exchange rate unchanged in the face of a favorable terms of trade shock that benefits a country could lead to an inflationary outcome.

It can be argued that, faced with a positive terms of trade shock in the early 1970s, monetary policy in Canada should not have attempted to slow or prevent the rise in the value of the Canadian currency. By permitting the rise in real incomes to take place via a rise in nominal incomes rather than through the currency appreciation, the policy response to the terms of trade shock exacerbated the inflationary effects that had been set in train by the earlier worldwide excessive aggregate demand.

Conversely, in the case of a deterioration of the terms of trade arising from a fall in export prices, the country must absorb a real depreciation. Here the choice is between a nominal depreciation and a fall in domestic nominal wages and prices relative to the path they would have taken otherwise. It should be noted, however, that if there is a nominal depreciation of the domestic currency, which is intended to facilitate the required real depreciation of the currency, the authorities must ensure that policy is such that the once-and-for-all price change arising from the nominal depreciation does not turn into a wage-price spiral.

*(5) When fiscal policy and monetary policy are working in opposite*

*directions, very large movements in financial variables, such as the nominal and real exchange rate and nominal and real interest rates, may result.*

In the earlier literature on the conduct of monetary policy there was little discussion of fiscal policy. However, the behavior of the world economy in the early 1980s in the face of tight monetary policy and loose fiscal policy in the United States (as well as in some other countries) gave rise to a clearer understanding of the effects of fiscal policy and the problems that can arise when fiscal and monetary policy work in opposite directions.

There are several issues regarding fiscal policy to which attention can be drawn. First, the interaction of loose fiscal policy and tight monetary policy can lead to a period of high real interest rates—the classic crowding-out mechanism. Second, loose fiscal policy and tight monetary policy in a major and increasingly open country such as the United States can lead both to high world real interest rates and, at least for a time, to an appreciation of its currency.<sup>22</sup> The higher value of the U.S. dollar in such circumstances is part of a second crowding-out mechanism since it is the U.S. net real trade balance that is thus indirectly reduced by the loose U.S. fiscal policy.<sup>23</sup> For other countries the upward pressure on the U.S. dollar in the first half of the 1980s in the context of a situation in which they were still concerned about their inflation rate resulted in monetary policies being set tighter than they otherwise would have been as these countries tried to offset the downward pressure on their currencies.

A more general point regarding fiscal policy involves the overlapping effects of fiscal and monetary policy on aggregate demand. That is, the expansionary effect on aggregate demand of a budget deficit puts more pressure on monetary policy in the achievement of a given level of overall spending. Moreover, during periods when other elements of demand are pressing against aggregate supply, a tighter fiscal policy can be very helpful in lessening short-run inflationary

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<sup>22</sup> See Feldstein (1986). The concomitant tightening of fiscal and monetary policies in other countries also played an important role in these outcomes.

<sup>23</sup> There is a massive literature on this subject. See, for example, Helkie and Hooper (1987), and Hooper and Mann (1987).

pressures. Thus, monetary conditions need not be as tight as otherwise if fiscal policy can contribute to easing pressures. Conversely, if easy fiscal policy accentuates pressures on demand from other factors, all the weight of restraining aggregate demand will fall on monetary policy and hence, interest rates and the value of the domestic currency will have to be higher than would otherwise be the case. It may also make it more difficult for the monetary authorities to achieve or retain credibility.

*(6) There are no simple ways of dealing with unfavorable supply shocks.*

Another of the key issues of the 1970s was the supply shock and its stepchild, stagflation. Although supply shocks can act in both directions, as the oil price declines in the second half of the 1980s have shown us, the difficult challenge to policymakers derives from an unfavorable supply shock. The literature that has developed around this theme has focused on the flexibility of nominal and real wages (including the issue of indexation), the persistence of the shock, the nature of the expectations mechanism at work, and whether the policy response by the authorities is accommodative or **nonaccommodative**.<sup>24</sup>

It became clear after the first oil shock that there was no way to avoid the real long-run effects of supply shocks. Effectively, in an oil-importing country an oil price **increase** led to a reduction in real income and, perhaps, the level of potential output. The principal challenge facing policymakers in such countries was how best to deal with the transitional effects along the path to equilibrium so as to minimize any further negative economic consequences of the shock. In the case of an economy with flexible nominal and real wages, this would have been fairly straightforward since real factor returns could adjust rapidly and completely to the oil price shock. That is, if it is widely **recognized** that real factor incomes in an oil-importing country have to fall as a result of an oil price increase and if this is accepted without any attempt to push up nominal factor incomes in response, there need be no secondary effects in response to the supply shock. However, if, as more commonly was the case, the factors of **pro-**

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<sup>24</sup>See, for example, Gordon (1984) and Bruno and Sachs (1985).

**duction** attempt to offset the initial decline in their real incomes by demanding higher nominal incomes, the supply side shock can lead to a wage-price spiral, which, in the mainstream model, can only be offset by a temporary period of slack. Thus we have the classic stagflation outcome in which inflation and unemployment are both rising as a consequence of the combination of the oil price shock and the policy response needed to avoid ongoing inflation.

In the context of such a scenario the nature of the policy response is worth considering in more detail. If the authorities tried to maintain an **unchanged** rate of unemployment in the face of the supply shock in a model where inflationary expectations are based on past rates of inflation, the outcome would be a permanent rise in the rate of inflation. On the other hand, responding to the oil price shock by trying to maintain an unchanged average price level (that is, by forcing down non-oil prices) might require a **very considerable** and protracted degree of slack in the economy. An intermediate position would involve holding nominal spending constant, thereby permitting an outcome with lower potential and actual real output in the longer run, a temporarily higher rate of unemployment, a once-and-for-all rise in the price level, but no rise in the underlying rate of inflation.

The supply shock also drew attention to the fact that indexation can create difficulties for the adjustment of the economy to real shocks. In the early literature on indexation the focus had mainly been on the role of indexation in response to nominal demand **shocks**.<sup>25</sup> The basic concern was whether indexation resulted in a faster and stronger response of inflation to positive aggregate demand shocks and, conversely, whether it would aid in the disinflation process by increasing the response of inflation to negative aggregate demand pressures. The newer literature focused much more on whether indexation presented obstacles to the long-run real adjustment of the economy in the face of other types of shocks and what the nature of the difficulties might be.<sup>26</sup>

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<sup>25</sup> Examples are M. Friedman (1974) and Giersch (1974).

<sup>26</sup> Gray (1976), Fischer (1977).

## Challenges of the 1990s

In this section of the paper I examine what seem to be the principal challenges in the 1990s in the design of monetary policy approaches. In the light of the lessons of the 1970s and 1980s, it is likely that the main challenge to large countries and to small countries operating under a flexible exchange rate regime will be the formulation of monetary policy in circumstances in which monetary and credit aggregates are not stable or predictable enough to play a central role as intermediate targets of policy. This is already the case in those countries which have dropped their targets. Even in those countries, which have continued to announce formal targets for one or more aggregates, the role of these aggregates has been downgraded vis-à-vis their position in earlier years. To jump ahead briefly to my conclusions on this issue, I will argue that it is likely that some monetary and credit aggregates will play a role, along with a number of other financial and nonfinancial variables, as information variables, but that they will probably not be able to bear the weight of being a formal intermediate target. Although some might argue that in the absence of formal intermediate targets central banks will return to the policy world of the 1960s with the emphasis on real variables, I will contend that the lessons that we have learned from the past two decades, such as the importance of focusing on nominal quantity variables and the need to take timely action to prevent inflation from accelerating, will be helpful in avoiding a repetition of the errors of earlier years.

Before turning to the question of how central banks in large countries and in small countries under flexible exchange rates might conduct monetary policy in the 1990s, I would like to examine in some detail the importance, both actual and potential, of such developments as globalization, liberalization of markets, and financial innovation. The analysis will be set in the context of a broad-brush overview of approaches to monetary policy and will touch on the implications of these developments for the way in which central banks conduct monetary policy. There are three principal policy conclusions. First, even after deregulation is complete, market processes will likely lead to ongoing financial innovation. Second, with abolition of exchange controls, and with more open domestic and international capital markets, countries that had previously relied upon credit rationing

and quantitative controls can no longer use such techniques as part of the policy process. Third, in the context of a world with open borders and high asset substitutability those countries that opt for fixed exchange rates *vis-à-vis* a larger country or join a currency bloc will retain little or no policy autonomy. Instead, they will receive the rate of inflation and credibility of the larger country or the currency bloc.

### *Liberalization and innovation*<sup>27</sup>

As suggested earlier, it is useful to distinguish between those developments that derive from the removal of controls or regulations and those elements that relate to market-oriented changes that are not a result of regulatory developments. The reason for emphasizing this distinction is that the former types of changes are clearly specific to those economies in the stage of removing regulations and will disappear as an issue once deregulation is complete. The latter types of changes, however, are likely to persist for a long time and will probably continue to impinge on monetary policymaking over the coming decade. I would also add that, although for analytic purposes I have separated liberalization and globalization, in practice, many of the pressures for innovation and liberalization derive from the global economy, in particular from the pressures on domestic markets and financial institutions arising from the existence of competing international markets and institutions.

One forecast that can be made with considerable confidence is that the process of removing interest rate ceilings and quantitative restrictions on credit flows will be pursued in those countries where it is not yet complete. The likely final outcome of the process is one in which the authorities do not impose any restrictions or ceilings on depositor interest rates and in which no attempt is made to impose credit rationing or quantitative restrictions on lenders.

The pressures toward such an outcome are both domestic and foreign, with the former probably the more important in larger countries and the latter in smaller countries. Among the foreign influences, access to external markets by both lenders and borrowers, most

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<sup>27</sup> For a broad general survey of these issues from an international perspective, see Akhtar (1983).

notably the Eurocurrency deposit and loan markets and the Euro-bond markets, must certainly head the list. By offering large financial and nonfinancial institutions access to alternative sources and uses of funds (at least where exchange controls do not constrain behavior) they considerably reduce the impact of ceilings and controls. One can also anticipate that smaller participants will increasingly get access to such markets. On the domestic side, such matters as increasing competition in financial markets and new developments in communications and automation are very significant.

In terms of the conduct of monetary policy, the countries most affected by the movement toward liberalization and opening of markets are those that had **previously** relied upon credit rationing and quantitative controls as a major part of the monetary policy mechanism. As it seems less and less feasible to impose credit rationing on lenders **and/or** borrowers because of their increasing ability to access unregulated domestic and external channels of credit, these countries will have to rely on market-based methods of **influencing** spending, that is, movements of interest rates and exchange rates. Whether or not they make use of monetary and credit aggregates as intermediate targets, they will face more volatile interest rates **and/or** exchange rates than in the past. Alternatively, if such countries become part of a large currency bloc, domestic monetary policy will cease to be an issue for them as they accept the policy of the country to whose currency they **have tied** themselves. I will expand on this point in the next section of the paper.

I now turn to the effects of deregulation and financial innovation on monetary aggregates and on the transmission mechanism, as exemplified by developments in the **North American** economies. In the United States, it was the ability of financial institutions to develop instruments and mechanisms whereby interest rate ceilings could be avoided that made such constraints increasingly irrelevant. In the context of the high nominal interest rates in the late **1970s**, money market mutual funds emerged, enabling depositors to earn rates of interest well above Regulation Q. And the direct impact on residential housing of the disintermediation in near-banks caused by Regulation Q, one of the key channels through which monetary policy worked in the 1960s and **1970s**,<sup>28</sup> became less and less significant as near-banks

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<sup>28</sup> de Leeuw and Gramlich (1969).

gained increasing access to nonregulated sources of funds and as securitization became more important in housing markets. In the event, the United States eliminated Regulation Q, after recognizing that the interest rate restrictions were having diminishing influence on macroeconomic behavior and were distorting the channels by which lenders and borrowers were brought together, resulting in an inefficient and inequitable **outcome**.<sup>29</sup>

One of the important results of the removal of interest rate ceilings and the consequent introduction of new types of accounts, most notably interest-bearing transactions accounts, was a shift in demand for money, particularly the narrow measures. Thus, the new NOW accounts attracted funds from both **checking** and savings deposits. Similar shifts followed the introduction of super-NOW accounts. To some extent, the redefinition of aggregates to include these new accounts was able to internalize the transfers.<sup>30</sup> But to the extent that funds flowed into the new types of accounts from outside the aggregate of which they were part, the internalization was not complete. For example, when funds shifted into NOW accounts from both traditional **checking** accounts and from savings accounts, the former movement did not affect the newly defined **M1** but the latter movement resulted in an upward shift in the aggregate. More important, the nature of the narrow aggregate changed with the introduction and spread of NOW and super-NOW accounts. Whereas previously, the demand for **M1** could have been written as a function of income and market interest rates, it was now likely to be a function also of wealth and the own rate of interest on those interest-bearing deposits included in **M1**. Furthermore, it is not necessarily the case that such own-rates will be related in a stable way to market interest rates. As a result, the narrow monetary aggregate is less likely to behave in stable and predictable fashion in the future in response

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<sup>29</sup> I would note in passing that one result of the elimination of the effects of disintermediation on spending is a steeper IS curve at real rates of interest above those that correspond to the nominal ceiling rates imposed by Regulation Q, and hence more volatile real interest rates in response to shocks in nominal spending.

<sup>30</sup> The Federal Reserve redefined M1 in 1980.

to changes in income and interest rates.<sup>31</sup>

Under these circumstances it is not surprising that the Federal Reserve has turned away from M1 and focused on broader aggregates, especially M2. However, in terms of stability of demand, these, too, are not ideal. There are potentially the same problems of own-rate adjustments to market rates as have affected the narrow aggregates. And there are other actual and potential problems, such as shifts in securitization, that will continue to affect M3, and, possibly to a lesser extent, M2.

The relationship between own-rates and market rates can significantly affect the behavior of both M1 and M2. There are two polar cases and an intermediate case to be considered. If own-rates always move one-for-one with market rates,<sup>32</sup> and if all or a large proportion of the aggregate bears interest, then the aggregate would become highly inelastic with respect to the general level of interest rates in both the short run and the long run. On the other hand, if own-rates tend to be sticky, then the response of the aggregate to changes in market rates would be high since there would be considerable substitution between the accounts included in the aggregate and instruments outside the aggregate as market interest rates change and as the spread widens or narrows.

The intermediate case in fact reflects what has happened in the United States in recent years. It would appear that own-rates are somewhat sticky in the short run but more flexible in the medium run and behave asymmetrically with respect to increases and decreases in interest rates.<sup>33</sup> In a way, this is the least satisfactory outcome

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<sup>31</sup> Some researchers disagree with the conclusion that the introduction of new accounts has made the narrow aggregates less stable. See **Rasche (1987)**, **Poole (1988)**, and **Darby, Mascaro and Marlow (1987)**. The argument is either that M1A (M1 excluding the new accounts) has remained stable or that a simple change in one of the parameters of the M1 equation ensures stability of M1. Others, for example **B. Friedman (1988a,b)**, argue equally strongly that M1 and other aggregates have become highly unstable. In the face of all the changes that have occurred and are likely to occur, continued stability of demand for the aggregates is far from a certain outcome. This does not, however, preclude use of the monetary aggregates, along with other variables, as information variables, as will be suggested below.

<sup>32</sup> As long as deposits bear reserve requirements, there will always be a wedge between movements in own-rates and movements in market rates, but this wedge is small for low reserve requirement ratios.

<sup>33</sup> **Moore, Porter and Small (1988)** present a detailed analysis of the determination of deposit rates.

since it leads to rather peculiar behavior of M2 when interest rates change. For example, a rise in market rates would lead initially to a decline in demand for the aggregate as market rates rise relative to deposit rates, eventually to be followed by a period of increasing demand as deposit rates move up relative to market rates. Most important, there is likely to be considerable uncertainty about the response of the aggregate to interest rate movements since the relationship between the deposit rates and market rates is **not** likely to be especially **predictable**.<sup>34</sup> A final point worth **noting** is that, as in all cases of structural change, a fairly long run of data is necessary to test the stability of relationships and to pin down the behavior of financial aggregates following an innovation.

More important in the future than deregulation is the likelihood that innovation will continue even in the absence of removal of controls. The Canadian case provides a good example of the types of developments that are possible. In the context of high and variable nominal interest rates in the late 1970s and early 1980s (resulting in large part from high and variable inflation), the reduction of communications costs, the spread of automation, and aggressive competition in the financial sector, there was a wave of financial innovation. New instruments were introduced which combined the characteristics of transactions accounts and savings accounts. And there was a spread of cash management techniques to middle-sized businesses of the sort that had previously been offered only to large businesses, permitting them to economize on low or zero yielding **deposits**.<sup>35</sup> M1 was dropped as a target in Canada in 1982 as a result of instability in its behavior which derived from market-led **innovation**, not deregulation-induced changes.

It is difficult to predict how important these types of changes will be in the future. On the one hand, with the ongoing development

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<sup>34</sup> It is of interest to note that in the 1970s Canadian M1 was considerably more interest-elastic than U.S. M1, since competing rates for the non-interest bearing deposits included in M1 moved much more in line with market rates in Canada than in the United States. In the 1980s the greater responsiveness of Canadian deposit rates to market rates has meant that Canadian M2 is less elastic than U.S. M2. The cause of the differences in interest rate movements in the two countries in the 1970s was the absence of interest rate ceilings such as Regulation Q in Canada, while the differences in the 1980s must be attributed to (as yet unexplained) differences in financial institution behavior in the two countries.

<sup>35</sup> Freedman (1983).

of technology and the increased competition in the financial services industry, one would expect a continuing flow of new instruments and new techniques. On the other hand, if inflation remains under control, there will not be a recurrence of the high nominal rates of interest of the sort that drove the process in the late 1970s and early 1980s. On balance, I would expect the flow of new innovations to persist and to result in periodic shifts in the demand for narrow money. Furthermore, the dual nature of the new types of accounts (with both checking and savings characteristics) and the lack of long runs of data with which to estimate the effects of a given innovation on the demand for narrow money will remain problems.

Although I have tended to emphasize the narrow aggregate **M1** in the discussion thus far, the broader aggregates have been and will be affected as well by financial innovation. In the United States, the spread of mortgage backed securities has reduced the size of financial institution assets and liabilities compared to what otherwise would have been the case, with savings and loan associations in particular selling off mortgages. And to the extent that households hold such securitized instruments in their portfolios in lieu of deposits, **M2** will have declined as well. However, one should not overestimate this aspect of innovation since developments may well take place in a rather gradual fashion, making it somewhat easier to monitor. Thus far, securitization has not been as important a factor in other countries as in the United States.?

The interpenetration of various kinds of financial institutions into each other's traditional territory has not had any profound effect on monetary policy but may require a redefinition of various monetary and credit aggregates. Thus, for example, as near-banks offer transactions services to households (as has become common in the United States, Canada and the United Kingdom) narrower definitions of money may have to be enlarged to incorporate appropriate near-bank liabilities.<sup>37</sup> Similarly, in the case of the broader monetary aggregates and credit aggregates, trying to limit definitions to one type of institution becomes less and less sensible as institutions become more alike. Indeed, shifts between different types of institutions (in

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<sup>36</sup> For a comparison between Canada and the United States, see Freedman (1987).

<sup>37</sup> This has already been done in the United States.

response, for example, to small changes in institutional interest rates or to marketing expenditures) will show up as shifts in bank-only aggregates but will be internalized in the aggregates that incorporate more types of institutions. Typically offsetting the usefulness of such "wider" aggregates is the problem of getting as timely information from near-banks as from banks. In Canada, thus far, the use of bank-only monetary aggregates has caused relatively little difficulty. Nonetheless, it is probable that the focus over time will have to shift to the "wider" aggregates, which empirically, tend to have better properties.

Much has been made in recent years of other kinds of innovations such as currency and interest rate swaps, options, forward rate agreements, note issuance facilities and Euro-commercial paper.<sup>38</sup> Indeed, at one time there was considerable discussion, exaggerated in my view, of the possibility that direct financing through markets would drive out intermediated financing through institutions. Of course, shifts of borrowing between syndicated bank lending and direct market lending would affect the size of M3. And this would cause difficulties if central banks were targeting on M3 or an equivalent aggregate.

However, for countries that focus on aggregates narrower than M3, it appears to be the case that these new techniques are unlikely to have any profound significance for the operation of monetary policy (with one possible exception to be discussed below). Thus, for example, the ability of financial institutions to use options and futures markets gives them greatly increased scope for matching assets and liabilities but, except in a country that has relied on institutional mismatches to restrain lending, there is, by and large, no great significance from a policy standpoint to such developments.

One possible exception to this generalization relates to the ability of borrowers to use the new instruments to shift from fixed-rate borrowing to floating-rate borrowing. More generally, the shortening of desired maturities by lenders and the drying up of long-term fixed-rate bond markets in the late 1970s and early 1980s, the introduction of various types of floating-rate instruments, and the creation

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<sup>38</sup> Bank for International Settlements (1986).

and spread of the swap market have considerably increased the use of floating-rate debt in place of fixed-rate debt.

The shift to floating-rate debt may have influenced the responsiveness of spenders to interest rate movements in a variety of ways. First of all, the substitution effect on spending from an interest rate change would be less in a world with greater use of floating-rate instruments than otherwise would have been the case. Put another way, spenders and borrowers would be less sensitive to what are viewed as temporary movements of interest rates in such an environment than in one where they were more dependent on long-term fixed-rate debt.<sup>39</sup>

Second, there is a much more complicated set of income effects in a floating-rate environment. When interest rates rise, all borrowers with floating-rate debt are worse off and all lenders holding floating-rate assets are better off. The responses of such borrowers and lenders to their changed circumstances will depend to a considerable extent on their balance sheet **situation**.<sup>40</sup> For example, at times of considerable balance sheet pressure (such as the early 1980s, when many borrowers had become overextended), a rise in interest rates could lead to sharp cutbacks in expenditures as interest payments increase **sharply**.<sup>41</sup> At other times, when borrower balance sheet positions are more comfortable, an equivalent rise in interest rates might have much less effect. The effect of an interest rate change on lender behavior would also be influenced by the balance sheet situation. If much of the floating-rate debt is held by pension funds or by wealthy individuals with a low marginal propensity to consume then an interest rate change would have little direct effect on lender behavior. However, to the extent that such instruments are held by households, or by

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<sup>39</sup> If the expectations theory of the term structure of interest rates held perfectly this would not be the case. However, if long-term rates tend to overshoot, as argued by **Shiller (1979)**, then the ability to borrow on a floating-rate basis enables spenders to carry out their plans even when rates are high, without locking themselves into very expensive long-term commitments.

<sup>40</sup> In much theorizing about distribution effects, it is assumed as a first approximation that such effects are neutral. See, for example, **Patinkin (1965)**. However, there may be circumstances in which such effects are important, as argued in the text. A particularly important non-neutrality may arise because of the growth in **government** debt.

<sup>41</sup> The strong response of both business and mortgage borrowers in Canada to high interest rates in the early 1980s provides an example of an important balance sheet effect.

banks whose deposit rates move *pari passu* with market rates, and if there are many liquidity-constrained households directly or indirectly holding such floating-rate assets, there might be a considerable effect on spending of an interest rate change via income movements. Given these various effects, it is an empirical question whether the slope of the IS curve is likely to be more or less steep in a floating-rate environment than in a fixed-rate environment.<sup>42</sup> It is clear, however, that the responsiveness of expenditures to interest rate changes will be more sensitive to the balance sheet situation of lenders and borrowers in the floating-rate environment.

In sum, I would expect innovation to continue to play an important role in financial markets, with the ongoing development of new instruments and new techniques and changes in existing instruments and techniques. Periodic unpredictable shifts in monetary and credit aggregates are, therefore, likely to occur in the future. Similarly, as exemplified by the effect on the IS curve of the shift to floating-rate instruments, there may well be effects on the transmission mechanism of the new instruments and techniques. Nonetheless, both kinds of changes are likely to be evolutionary rather than revolutionary.<sup>43</sup>

#### Globalization and the role of the exchange rate<sup>44</sup>

The terms internationalization and globalization have been used in a variety of ways and can encompass a variety of phenomena. One traditional use of these words involves an increase, to high levels, of asset substitutability. That is, investors and borrowers are willing to shift among markets for very small expected returns. A necessary but not sufficient condition for high asset substitutability is capital mobility, which is defined as the absence of policy restrictions on movements of funds between countries.<sup>45</sup> A more recent use of the

<sup>42</sup> Akhtar (1983), in contrast, argues that the IS curve will be flatter following market liberalization as interest rate changes have a broader influence on the behavior of spenders.

<sup>43</sup> It is worth noting that some observers have argued that the spread of debit cards and the move toward a cashless society will have a more profound effect on the financial landscape than I have suggested.

<sup>44</sup> Bryant (1987) provides a broad treatment of issues related to globalization.

<sup>45</sup> Boothe, Clinton, Coté and Longworth (1985) and Caramazza, Clinton, Coté and Longworth (1986).

term internationalization focuses on the establishment by financial institutions of offices in a large number of foreign countries. Although financial intermediaries can carry out international transactions around the world from their home base, they tend to be more internationally oriented when they set up offices outside their home territory. Yet a third and most recent meaning of the term globalization seems to derive from the notion that financial innovations in one country spread quickly to other countries and affect the behavior of their financial markets.<sup>46</sup> Thus markets are linked to an extent and in ways that are without precedent.

The three definitions just set out are not independent of each other. Nor are they unrelated to the ideas of liberalization discussed in the previous section. Many of the factors that were important in explaining innovative behavior, such as the decline in the cost of **communications** and the spread of automation, are also important in explaining aspects of globalization. And, as mentioned earlier, globalization in itself has been a key element in some kinds of innovation.

I would like to begin this section by focusing on that aspect of globalization which is most important for monetary policy, the increase in the elasticity of substitution of assets across borders. This is not a new development. The classic articles by Mundell on monetary and fiscal policy in a world with perfect substitutability under fixed and flexible exchange rates were written more than 25 years **ago**.<sup>47</sup> Even then, it could be argued that Canada was a **small** open economy facing infinitely elastic capital flows. **Developments** of the last 25 years have moved other economies toward a similar stage of openness. These have included, most importantly, the weakening or abolition of capital controls and exchange restrictions, and the broadening of horizons of both lenders and borrowers beyond domestic financial instruments. In part, the latter development can be attributed to the penetration of international banks into what was the domain of domestic banks; in part, it has resulted from the reduction of transactions and communications costs that have made such alternatives less **costly**.<sup>48</sup>

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<sup>46</sup> This behavior may, itself, be linked to the spread of international banks.

<sup>47</sup> Mundell (1963), Fleming (1962), and Frenkel and Razin (1987).

<sup>48</sup> Bank for International Settlements (1986).

As suggested earlier, one of the key implications for monetary policy of the opening of borders in some countries was the inability of the authorities to use credit rationing and other forms of quantitative controls on credit. Once major borrowers can evade the controls by borrowing outside the country, attempts to control the macroeconomy by imposing limits on the growth of loans by financial institutions prove ineffective. That is, exchange controls or a very dirigiste set of controls on borrowers are virtually essential to using credit controls as a central part of the monetary policy mechanism. The growth of Euromarkets was most notable in facilitating the access to credit outside the home country but it was certainly not a prerequisite for such a development to take place. Canadian borrowers had long been accessing the U.S. domestic market and, had the United States not imposed controls in the late 1960s, some of the business done by international banks in London would probably have been done in New York (perhaps via international banking facility types of operations).

Thus, asset substitutability has increased in magnitude over the years because of the introduction of new instruments, the removal of restrictions, the reduction of transactions and communications costs, and the spread of international banks. The linking together of markets through the increase in asset **substitutability** has had important implications for the workings of monetary policy over and beyond restricting the ability of countries to use credit controls, and will be an important factor in the way monetary policy is conducted in future years.

In a small open **economy with** flexible exchange rates, monetary policy is transmitted via both interest rates and exchange rates. And as economies become more open to foreign financial influences, the greater **will** be the importance of the exchange rate channel. In the typical closed economy model, the tightening of monetary policy operates to increase interest rates, which, in turn, reduces **interest-sensitive** expenditures. Typically, the focus is on investment expenditures, residential construction, and consumer durables. In addition, spending on other forms of consumer goods is reduced via the wealth effect, at least in a world where long-term fixed-rate assets predominate.<sup>49</sup>

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<sup>49</sup> And in a world with Regulation Q types of ceilings there would be disintermediation and credit rationing by financial institutions.

In the corresponding open economy model with flexible exchange rates, the tightening of monetary policy tends to increase the value of the domestic currency as well as to raise interest rates.<sup>50</sup> The result is to reduce expenditures by foreigners on home goods and to shift expenditures by domestic residents from domestically produced goods to imports.<sup>51</sup> In addition, there is a direct effect on prices of the currency appreciation, particularly in the case of the small open economy where the prices of both exportables and importables respond fairly directly to exchange rate changes.<sup>52</sup>

I would thus conclude that, although the mechanism through which monetary policy operates in an open economy under flexible exchange rates differs from that in the traditional textbook closed economy model, that difference, in itself, is not a matter of overwhelming significance.<sup>53</sup> What does seem to have been a source of concern for some observers is the fact that exchange rates have moved for many reasons other than monetary policy developments, and that the trade balance in major countries has swung around strongly at times over the 1980s. These developments have led to pressures for protectionist legislation to be enacted and to arguments for a return to a world with increased fixity of exchange rates.

Over and above monetary policy, major factors in determining exchange rate movements in recent years have included fiscal policy, terms of trade changes, and random or speculative movements. In the case of fiscal policy (and the United States in the 1980s is the clearest example), the external side has acted as a sort of safety valve to lessen the effect on the demand for U.S. goods and services of U.S. fiscal easing. Thus, the appreciation of the U.S. dollar acted to spread the effects of the U.S. demand expansion to the rest of

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<sup>50</sup> Dornbusch (1976) and Frankel (1979).

<sup>51</sup> In some models the emphasis is on supply responses. **Tradables** and **nontradables** then become the important classificatory distinction.

<sup>52</sup> In a situation in which all countries are tightening policy simultaneously, exchange rates will tend to remain more or less unchanged and monetary policy will operate primarily through interest rates and the cost of capital.

<sup>53</sup> Nonetheless, there are complaints from the traded goods industries when the domestic currency appreciates, just as industries that produce interest-sensitive products complain when interest rates rise. The new literature, which emphasizes economies of scale, startup costs, and so forth in the provision of internationally traded goods, has also expressed concern about the impact of large exchange rate movements (Krugman (1989) and Hams (1989)).

the world.<sup>54</sup> Unfortunately, a side effect of this episode was the increased demand for protectionism in the United States as the affected traded goods industries attributed their situation to unfair foreign competition and not to the U.S. budget deficit.

Significant changes in terms of trade tend to bring about a cushioning movement in the exchange rate. Thus, for example, a rise in the the world prices of raw materials will tend to lead to an appreciation of the currency of a raw materials producer. This has the effect of spreading the real income gains from the rise in raw materials prices throughout the economy. It also tends to relieve some of the aggregate demand pressures that would otherwise have percolated through the economy. At the same time, the exchange rate change will affect the competitiveness of the producers of those exportable goods whose prices have not risen and also the competitiveness of import-competing goods, most notably manufactured goods. Producers of such goods will point to the floating exchange rate as the cause of their problems as opposed to the more basic factor, which is the real effects of the overall rise in raw materials prices.

It is worth noting that in many models of the small open economy under flexible exchange rates the long-run response of the economy to shocks works entirely through the real exchange rate since real interest rates are assumed to converge internationally over time. However, in the short to medium run, both interest rate and exchange rate mechanisms operate, since real interest rates can differ across countries as long as real exchange rates are expected to change.

Thus far I have discussed the exchange rate response to monetary' policy actions, fiscal policy changes<sup>55</sup> and terms of trade changes (as exemplified by a change in the ratio of raw materials prices to the prices of manufactured goods). In all these cases, the resulting exchange rate change acts either to transmit the policy change, as in the case of monetary policy, or to smooth the effect of the shock on the domestic economy. A different kind of shock is that which

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<sup>54</sup> Although, in one sense, the spillover of U.S. demand was welcome in the context of the early 1980s as the world was recovering from recession, the associated pressures on the prices of countries whose currencies were depreciating were a source of concern to these countries.

<sup>55</sup> The effects of any domestic demand shock can be treated in much the same way as a fiscal policy change.

causes an exogenous movement in the exchange rate. This can be attributed to randomness, or bubbles, or speculative behavior, or overshoots, or shifts in portfolio preference. Such shocks will have an effect on aggregate demand and prices, as well as on traded goods industries. And in such cases, there will also be demands by these industries that monetary policy be used to avoid the kinds of effects that are causing difficulty.

The issue can be put into a wider context. In the face of movements in exchange rates caused by identifiable or nonidentifiable factors, what should be the response of monetary policy? At one extreme is the view that monetary policy should act to hold the exchange rate unchanged in the face of all shocks. However, as suggested earlier, the exchange rate movement plays a useful cushioning or smoothing role in many circumstances. Attempts to prevent the exchange rate from moving in such situations closes off the safety valve needed to lessen the domestic pressure on demand and on prices arising from the shock. Consider, for example, what would have happened in the United States in the first half of the 1980s had monetary policy been directed to holding the exchange rate unchanged in the face of a very expansionary fiscal policy. Interest rates would have had to be pushed to much lower levels, the monetary aggregates would have grown much more quickly, and there would have been considerable upward pressures on prices in the United States.

In the case of exogenous shocks to the exchange rate arising from portfolio substitution or truly random behavior, one can argue that the impact on aggregate demand of the exchange rate change, particularly if it appears to be long-lasting, should be taken into account in the setting of monetary policy. Thus, for example, if the currency has depreciated exogenously, action should be taken to encourage an upward movement in interest rates. One can think of this policy prescription as a way of achieving a given monetary aggregate target. That is, the depreciation would tend to cause a rise in aggregate expenditures and in prices, thereby putting upward pressure on the monetary aggregate, while the rise in interest rates would put downward pressure on the aggregate, both directly to the extent that money demand is inversely related to the interest rate, and indirectly via slowing the increase in aggregate demand and prices.<sup>56</sup> For those

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<sup>56</sup> Duguay (1980), Freedman (1982)

more concerned with nominal spending as a guide to policy, the argument would be that the interest rate increase would offset the pressure on aggregate demand arising from the depreciation, leaving nominal spending more or less unchanged.

In the discussion thus far I have been arguing from the perspective of the advantages to a single economy from having flexible exchange rates, particularly where the shocks to the economy come primarily from terms of trade shifts or aggregate demand shocks rather than from exogenous shocks to the exchange rate itself. There are two other approaches to these issues that require discussion. The first argues for the benefits to the individual small country of tying its currency to a larger partner. The second takes the perspective of the world economy and argues for cooperation/coordination to minimize adverse spillover effects from country shocks.

I begin with the arguments for and against fixed exchange rates from the point of view of a single small country with an open economy. There are two key aspects that I want to focus on. First, a small country that fixes its exchange rate to the currency of a single large country or to a basket of currencies of a number of countries ties its inflation rate to that of its partner or a weighted average of its partners. Second, in the face of real shocks to the terms of trade, adjustment of the real exchange rate must take place through differential price movements rather than through nominal exchange rate changes. I now examine these issues in more detail.

In a world with perfect asset substitutability, no exchange controls and fixed exchange rates, there is virtually no autonomy in monetary policy for the small **country**.<sup>57</sup> Thus, the country trades off its ability to influence domestic nominal variables in return for the rate of inflation of its **larger** partner. This decision is more sensible, the greater the confidence a country has in the central bank of the country to which it is tying its currency and the greater the similarity of the shocks faced by the two countries. In the case of the EMS, other countries have been able to import the credibility of the Bundesbank by tying their currencies to the German mark. And, indeed, there has been a convergence of inflation rates over time among those European countries that have associated their currencies with the mark.

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<sup>57</sup> Mundell (1963).

Although in the long run a country's inflation rate is tied to that of its partner, in the short run this need not be so in two cases. The first is the case where the country fixes the value of its currency above or below the equilibrium value. If the currency is initially fixed at a rate that is above the equilibrium, the country will have a current account deficit and weak aggregate demand, **until** its price level moves down to its appropriate relationship with the partner's prices. If it is initially set below the equilibrium level, the country will have trade surpluses, strong aggregate demand, and upward pressure on prices, until its price level moves up to an appropriate relationship with the partner's prices. The second case is that in which a small country faces a domestic aggregate demand shock not faced by its partner. Consider, for example, an expansionary shock. If there were perfect substitutability of goods and services, the shock would manifest itself entirely in a trade deficit. More realistically, if there is imperfect substitutability between domestic and foreign goods, the small country will face a period with high aggregate demand and rising prices relative to its trading partner, with a resulting trade deficit. Eventually, however, the small country must undergo a period of weak demand and lower price inflation than its partner in order to bring its price level back into line with that of its partner. This might be a **difficult** process, particularly if the partner's economy is at or close to price stability. Of course, a discrete nominal depreciation would be simpler in such a situation but then the country would be back in the world of adjustable pegs, periodic runs on the currency, and much less benefit from the credibility of its partner.

Even more important is the situation where there are sizable external shocks which are specific to the small country and do not affect its potential partner. A common shock of this type is the shift in raw materials prices relative to manufactured goods prices. In such a case, as argued earlier, the movement in the exchange rate can act to moderate aggregate demand pressures, to spread the costs and benefits of the change in product prices throughout the economy, and to move the real exchange rate toward its equilibrium. Of course, even with flexible exchange rates the adjustment is not all that easy. There is always the risk that a currency depreciation in response to a negative terms of trade shock will feed into a wage-price spiral. And flexible exchange rates will sometimes move away from equilibrium, not toward them. Nonetheless, in the case of a country subject to periodic

sizable external shocks which are specific to it and do not affect its potential partner, it is hard to argue that fixed exchange rates will dominate flexible exchange rates.<sup>58</sup>

The arguments for and against cooperation/coordination have been set out elsewhere and need not be repeated in detail here.<sup>59</sup> The points of particular significance of that debate for monetary policy are four-fold. First, the **cooperative** sharing of information to ensure awareness in various countries of both economic developments and policy initiatives in other countries is clearly useful. It will increase the likelihood that countries take spillovers into account in planning their own policies and that any potential inconsistencies in policy goals (for example, if countries were aiming at inconsistent exchange rates or current accounts) among the countries involved can be avoided. Furthermore, if discussion of the implications of policy changes for the home country and for foreign countries results in improved domestic policies, that, too, is clearly useful. Second, given uncertainty about both projections of economic developments and the true economic model, it is unlikely that a coordinated attempt to fine tune policy in the international arena will be any more successful than fine tuning was on the domestic **scene**.<sup>60</sup> Third, some proponents of coordination have emphasized the stability of exchange rates as a central part of the **exercise**.<sup>61</sup> Using monetary policy to stabilize exchange rates as suggested by these authors raises the question of an anchor for the overall system. If there were no such anchor there would be a real risk of a higher world rate of **inflation**.<sup>62</sup> Fourth, as argued above, exchange rate changes may be beneficial in moving countries toward their new equilibrium in the case of large and **long-**

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<sup>58</sup> In this connection, it is worth noting the literature on optimal currency areas where the focus is on such matters as the mobility of labor, the openness of the economy, the nature of shocks, and the flexibility of real wages. See **Mundell (1961)**, **McKinnon (1963)**, **Ishiyama (1975)**, and **Tower and Willett (1976)**.

<sup>59</sup> **Frenkel**, Goldstein and **Masson (1988)**, **Feldstein (1988)**.

<sup>60</sup> **Frankel** and **Rockett (1988)**.

<sup>61</sup> **Williamson** and **Miller (1987)**.

<sup>62</sup> **Rogoff (1985)**. See **Williamson** and **Miller (1987)** and **Frankel (1989)** for a discussion of the usefulness of nominal GNP targeting as the nominal anchor in the context of a coordination exercise.

lasting terms of trade shocks. In such circumstances, attempts to stabilize exchange rates could be counterproductive. In contrast, a situation of temporary speculative pressures on the exchange rate provides the best case for using policy (both intervention and monetary policy) to stabilize exchange rates. I would conclude that although there can be benefits in exchanging information and taking account of developments in other countries in the setting of policy, there are also risks requiring careful consideration in moving further to a world of extensive policy coordination.

### *The conduct of monetary policy in the 1990s*

In the previous subsections I have argued that central banks will likely be faced with periodic or continuing uncertainty regarding the stability of the financial aggregates, first as deregulation continues in some countries, and second as technological innovations and reductions in communications costs permit institutions to offer new products and to devise new techniques for doing business. I have also argued that there has been a rise in international asset substitutability in many countries and that this is likely to continue as markets are increasingly linked, in part through the **actions** of large banks and securities dealers and in part through the broadening of the horizons of both lenders and borrowers. The removal of the remaining exchange and capital controls will increase the likelihood of such an **outcome**.<sup>63</sup> Finally, those central banks opting for fixed exchange rates in a world with no exchange controls and a high degree of asset substitutability will have little policy autonomy and their policy will, in effect, be that of the large country to which they have tied their currency.<sup>64</sup>

With this as background, one can ask how monetary policy can be conducted by either the central bank of a small country under **flex-**

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<sup>63</sup> Bryant (1987) argues that although the world is moving in the direction of increased asset substitutability, the paradigm of perfect substitutability is not yet applicable to the international economy.

<sup>64</sup> Small countries might try to influence the policy of the large country in these circumstances. They might also have some role in the management of a single central bank for a unified currency bloc.

ible exchange rates or the central bank of a large country acting as the center of a group of countries which have tied their currencies to it. In response to such a question I would put forward the following propositions, based in part on the lessons of the 1970s and 1980s.

(1) It is important that the authorities commit themselves to a clear long-term or ultimate goal for a nominal quantity variable or anchor. Price stability is the most appropriate goal. Since price expectations tend to be sticky, it will not be easy to reach the goal of price stability from an inflationary **starting** point. In this context, establishing credibility will be significant.

(2) There will likely be a continued role in most countries for financial aggregates as a policy guide or information variable, but the role will be less central than their use as an intermediate target in earlier years, given the effects of deregulation and innovation.

(3) Monetary policy is ill-suited for dealing with such issues as current account imbalances and the accumulation of internal and external debt.

*Importance of commitment to long-term goal of price stability.* In the absence of a monetary aggregate that is likely to perform well as a **target**, central banks **will** have to establish and maintain credibility by setting and moving toward goals that they are believed capable of achieving. One potentially helpful way of gaining credibility is for the central bank to announce and move toward a long-run goal of price stability. The achievement of such a goal would be the contribution of monetary policy to improving the performance of the **economy**.<sup>65</sup> This approach has the added benefit of establishing a long-run target on which the central bank must maintain its focus even when setting policy in the short to medium run. As such, it gives the central bank a "place to **stand**"<sup>66</sup> in debates about policy

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<sup>65</sup> Crow (1988).

<sup>66</sup> Bouey (1982).

and ensures that the central bank will bring a long-run perspective to the policy formulation process. As the central bank achieves a gradual disinflation, its credibility will be enhanced and further progress will be facilitated.

In spite of its appropriateness as a long-run goal of policy, it is likely that there will be criticism of the focus on price stability. There will be those who argue that the central bank should aim at maintaining a constant, fully anticipated rate of inflation at whatever the current rate of inflation happens to be. Others will argue that price stability is an inappropriate goal because it is too difficult to reduce the rate of inflation given the stickiness of price expectations, or because such a policy will have too much of an impact on less favored regions of the country.<sup>67</sup> The proponents of a policy of price stability can point to the fact that, given its tools, it is natural for a central bank to try to achieve a nominal quantity goal, that price stability is a sensible long-run target in an economy that relies on money and on the price system since the economy will perform best under such circumstances, and that it would not be possible to achieve a constant fully-anticipated non-zero rate of inflation.

***A role for financial aggregates in a world of financial innovation.*** Even if it were agreed that price stability is an appropriate long-run policy goal, the central bank would still prefer to have an intermediate target to help it conduct policy over the medium term. Here, unfortunately, a degree of eclecticism or judgment is likely to be required over the next few years. I am skeptical that the monetary aggregates will be able to bear the weight of being a formal intermediate target for policy under the situation of continuing financial innovation that is likely to persist over the next few years. This does not mean that every country will drop the use of financial aggregates as announced targets. It does mean, however, that even if they do have such an intermediate target it will not be as central to policymaking as in the past and that it will be only one of a number of (mainly nominal) variables on which central banks will focus attention over the medium term.

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<sup>67</sup> Lucas (1989).

In my view, it is most useful to think of financial aggregates, both money and credit, as playing the role of policy guides rather than formal targets over the next few years. The distinction between these two concepts—policy guide and **formal** target—is one of degree rather than of **kind**.<sup>68</sup> For a central bank to use an aggregate as a target variable, it should be able and willing to achieve the announced target growth rate for the chosen aggregate on most occasions. If it did not do so, there would be a loss of confidence in the chosen aggregate and, perhaps, a loss of credibility by the central bank.

What would be the conditions under which an aggregate could be used as a formal target in a world where the goal of monetary policy is, first, to reduce the rate of inflation over time and, second, to **main-**tain price stability once it is achieved? First, there would have to be a stable relationship between the chosen monetary aggregate and a goal variable, either nominal spending or prices. Second, if the chosen aggregate diverged from the target growth path, the central bank would have to be able and willing to act in such a way as to return it to that path over a time period that is not overly long. Third, along the disinflationary path, it would be helpful if, over time, the target path for the chosen aggregate had a monotonically declining growth rate. I examine each of these elements in turn.

The question of the stability of a relationship is one of judgment. Is the relationship perceived to be sufficiently stable so that one could be reasonably confident that the target range would not have to be readjusted frequently because of shocks to the monetary aggregate, whether caused by the normal disturbances to the relationship or by **financial** innovations? Clearly, if one had to readjust the target range too frequently, the target would soon lose value in assisting the authorities to conduct policy or in assisting the public to evaluate policy and to formulate expectations of future developments.

Typically, the view that an aggregate has a sufficiently stable relationship to spending to serve as formal target would be based on the good performance of either demand for money equations or **reduced-**form equations. As I argued earlier, in many countries the judgment has been that such equations have not performed well enough in recent

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<sup>68</sup> The next few paragraphs draw heavily on Freedman (1989). For a broad and comprehensive discussion of issues of intermediate targets and information variables see B. Friedman (1988c).

years or will likely not perform well enough in coming years to satisfy the strong requirements of being a target.

The second characteristic of a target as opposed to policy guide is the capacity and willingness of the authorities to engineer a relatively quick return to the target path following a divergence caused, say, by excessively rapid growth in spending. Analysis of the properties of the broader aggregates that are the likely candidates for intermediate targets suggests that if one targeted on them and wished to return them to a target path following a surge in their growth rates it could well make sense for the return to be rather gradual.

There are two (related) reasons for this conclusion. First, it might not be feasible for the central bank to achieve control over these aggregates over a very short period of time without excessive swings in interest rates. Second, and related to this point, the effect of interest rate changes on the broader aggregates occurs over a one- to **two**-year horizon more through indirect effects, that is, via induced effects on aggregate demand, and less through the direct effects of the interest rate movements on desired holdings of deposits. This is in contrast with the experience with narrow aggregates where, over the **one**-to two-year horizon, the direct effects of the interest rate change tend to be greater than the indirect effects via output and price changes. The appropriate way to respond to a spending-induced acceleration of the aggregates is to tighten the stance of monetary policy sufficiently so that the combination of the direct effects of the interest rate rise and the indirect effects of the nominal spending decline (caused by whatever combination of higher interest rates and, stronger exchange rate emerges from the tightening of policy) brings the monetary aggregate back to its desired path. Given the lag between the interest rate change and the response of nominal spending, this implies a somewhat longer period in which broader aggregates could diverge from their target ranges than would be the case with a narrow aggregate.

The third helpful characteristic for a formal target that was mentioned earlier was a monotonically declining path over the period of disinflation. This, too, would not necessarily be the outcome of using a monetary aggregate as a target. The principal reason is that such an aggregate may be somewhat interest-elastic. This again raises the re-entry issue, that is, the temporary increase in the growth rate of interest-elastic monetary aggregates as nominal interest rates

decline during the disinflationary process, albeit in weaker form for the broader aggregates than is the case for narrow aggregates.

Indeed, model simulations of various disinflationary paths indicate that preferred scenarios which incorporate reasonably smooth paths of the goal variables do not typically imply monotonically declining growth paths for monetary aggregates. Conversely, **smoothly** declining growth paths for monetary aggregates usually imply very cyclical behavior for spending, output and inflation.

For a financial aggregate to serve as one of a number of policy guides is less demanding than to function as a formal intermediate target. Rather than a stable and tight-fitting demand function, one requires of an aggregate only that it be able to contribute information as to the growth of nominal spending or output or prices.<sup>69</sup> That is, one focuses on the information content of various aggregates, both money and credit, in terms of their ability to predict future movements of nominal spending as well as future movements of output and **prices**.<sup>70</sup> In this a structural approach to the data, one searches for empirical regularities on both a contemporaneous and leading basis between the aggregates and "goal" variables. The objective is to see whether the aggregates can be helpful in warning of excessively rapid increases in nominal spending or prices or sudden declines in nominal spending.

More broadly, one can consider policy as operating in the following way. The underlying goal of **monetary** policy is price stability. On the path to that goal; one looks at everything, for example, the growth of nominal spending and of the financial aggregates, the behavior of wages and prices, and the demand pressures on the economy relative to its production capacity. The role of the monetary aggregates in this context is twofold. First, they provide important information (in addition to that available from other data) on spending and inflation in the economy. Second, the monetary aggregates act as a kind of checkoff item in terms of the thrust of monetary policy actions, that is, something that has to be considered frequently and

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<sup>69</sup> The aggregate can be a leading indicator either because it actually moves in advance of the goal variable or because it moves contemporaneously with the goal variable but is known in advance.

<sup>70</sup> For the Canadian experience, see Hostland, Poloz, and Storer (1988), Milton (1988) and Muller (1989). For a pessimistic view regarding the U.S. situation see B. Friedman (1988a).

carefully in the course of deciding on the stance of policy. Of course, at times a response to excessively rapid or slow monetary growth may not be necessary since the reason for the changed growth of the aggregate could be an identified special factor. But, at times, the aggregates may be signalling that the growth of aggregate demand is faster or slower than had been anticipated and that some policy response is needed.

The events of 1987 and 1988 in Canada provide a useful illustration of the contribution that monetary aggregates can make to policy. In both years it became apparent that spending growth was much faster than had earlier been anticipated. As a result of the very strong spending growth, the stance of policy was progressively tightened through much of the **period**.<sup>71</sup> One of the key pieces of information buttressing the decision to tighten policy was, initially, the acceleration in the growth of **M2** and the wider measure **M2+** and, then, the persistence of the rapid growth of these aggregates. Thus, developments in **M2** and **M2+** provided an important "early warning signal" of changes in nominal spending. I hasten to add that such signals are cross-checked against a variety of other sources of information, both in the financial and nonfinancial sphere. And the developments of the aggregates themselves require careful interpretation to take account of known special factors influencing growth.

It has been argued that "looking at everything" is a recipe for poor policymaking, that it does not give the central bank sufficiently firm intermediate guidelines to withstand the pressures of the short run and that it is likely to bring us back to the unsatisfactory situation of the later 1960s and 1970s with the risk of recurrence of unacceptable rates of inflation. I would argue that there are (or should be) significant differences between the **1960s** and the **1990s**, of which the most important is the ability to learn from the lessons of the 1970s and 1980s. First, the variables on which central banks now focus are largely nominal quantity variables, perhaps not as a target, but nonetheless, as important inputs to policy. The risks of targeting **solely** on a real variable such as unemployment, or output relative to potential, or output growth are now well known. And by continuing

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<sup>71</sup> Following the stock market crash of October 1987 there was a relatively short period in which monetary conditions eased.

to pay considerable attention to financial aggregates which have some leading indicator properties, as well as to nominal spending and wages and prices,<sup>72</sup> one can hope to avoid cumulative upward pressure on price inflation of the sort that can break out if one targets on a real variable.

Another lesson one hopes has been learned is the importance of timeliness. One must act quickly to scotch upward pressures on the rate of inflation, not wait for the data to show an acceleration, because of the risk that the inflation will become entrenched. Here, too, the emphasis on leading indicators and even nominal spending is helpful. Thus an acceleration or continued high growth in those financial aggregates that provide leading information regarding spending and price developments should be taken seriously in the absence of knowledge about unusual behavior of such aggregates. Indeed, one should keep an eye on all variables that are known to contain information about inflationary developments. If all, or almost all, of them are pointing in the same direction, it is a clear signal that monetary conditions need to remain tight or to be tightened. On the other hand, when information is mixed, it is harder to decide and one has to move with more caution. The behavior of central banks in the **1987-88** period suggests that the lesson of timely response has also been absorbed.

*Monetary policy is ill-suited for dealing with current account imbalances and the accumulation of internal and external debt.* One issue that gets raised periodically is the extent to which central banks should take account of such matters as domestic and international debt burdens and trade imbalances in setting policy. In the context of the approach taken in this paper, I would argue that the accumulation of the stock of liabilities that is the basis for the expressed concerns can potentially affect policy in two ways. First, if the buildup of liabilities were to bring about a crisis in a particular financial market that was likely to spill over and affect other markets, central banks would act as the ultimate suppliers of liquidity in order to prevent market contagions. This is the type of action that was taken in October **1987** in the wake of the stock market plunge. Second, as argued

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<sup>72</sup> Even though wages are known to be lagging indicators.

earlier, the effect on spending of a given change in interest rates and exchange rates can, at times, be significantly influenced by the balance sheet position of households and corporations. Hence, the achievement of a given spending path or a given path for a monetary aggregate may be associated with quite different movements of interest rates and exchange rates, depending on the balance sheet positions of spending units.<sup>73</sup>

As for the possibility of using monetary policy to achieve better outcomes in the current account of the balance of payments, I would argue that such a policy would be inappropriate. First of all, it is crucial that policy be directed to its primary goal, the achievement over time of price stability. Second, during the period in which monetary policy is acting to bring down the rate of price inflation, the domestic currency may well appreciate temporarily and hence the current account balance may well "deteriorate" for a period of time. Third, the current account is influenced to an important extent by fiscal policy and by shocks to savings and investment behavior in both the domestic and foreign economies. Monetary policy cannot and should not be asked to try to counteract the implications for the current account of changes in fiscal policies.

In conclusion, I would summarize the framework for monetary policy sketched out in this part of the paper as one which has price stability as the ultimate target, a variety of variables (including, prominently, the monetary aggregates) as guides to policy but perhaps not as formal intermediate targets, and policy operating through interest rates and exchange rates as channels. I expect that some variant of this type of framework will be used in the 1990s by countries that do not opt for a fixed exchange rate regime.

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<sup>73</sup> In terms of the simple IS-LM model, what we are saying is that a change in the slope of the IS curve will lead to a different path of interest rates in the face of shocks, for given money or nominal spending guidelines.

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