

## LAGS IN THE EFFECT OF MONETARY POLICY: FOREIGN COUNTRY EXPERIENCES

*This article briefly examines the experiences of four industrial countries with lags in the effect of a tightening in monetary policy.*

### Introduction

Major changes in monetary policy were made in the late 1970s and early 1980s in the United States, United Kingdom, Canada and Australia. The purpose of this article is to provide international parallels with the current situation in New Zealand, where monetary policy has been 'tightened' but where the effect of this policy has not yet been reflected in significantly slower growth in the main money and credit aggregates and in prices.

### Overview

The analysis shows that tighter monetary policy led to a period of slower real growth in the monetary aggregates over time in Canada, the United States and the United Kingdom.<sup>1</sup> The Australian experience is too recent to draw any firm conclusions. The lag (or, the time which elapses) between a tightening of monetary policy and a sustained reduction in the real growth rate of the monetary aggregates was in excess of 2 years in the United Kingdom, but only a matter of months in both the United States and Canada.

An experience common to all four countries has been the effect of financial market innovations and deregulation in distorting the traditional monetary aggregates. In addition, all have experienced sharp changes in the velocity of circulation. The velocity of broad money has fallen in all the major industrial countries since 1980. M1 velocity has undergone sharp changes in both directions in both the United States and Canada.

The response to these distortions has varied between countries. In the United States, the Federal Reserve Board effectively revised its monetary target several times by applying it to a new base level, by redefining M1 in 1980 to include new deposit instruments, and

<sup>1</sup> For each of the four countries, this article focuses on the monetary aggregate which that country's monetary authority emphasises as a target or uses for its projections. These aggregates are described in the appendix.

again in 1982 by abandoning their M1 target range in favour of a target range for M3. The Bank of Canada abandoned targeting altogether in 1982 in favour of an eclectic approach, while more recently (in 1985) the Reserve Bank of Australia has taken a similar move. The Bank of England reduced the importance of their target range on sterling M3 in 1982 by introducing new target ranges on M1 and on the broader PSL2 (private sector liquidity) aggregate. However, in 1984 the targets on M1 and PSL2 were discontinued and replaced by a target range on M0. Interest rates and the exchange rate have also been important indicators considered by the Bank of England in formulating monetary policy.

For the countries in this study, the lag between a tightening of monetary conditions and a sustained fall to an inflation rate of about 5 per cent ranged between 2 and 5 years. In all countries the inflation rate peaked within 6 months to 2½ years of the policy tightening and fell quite sharply in the year immediately following the peak. Other factors affecting the speed of adjustment in the inflation rate included wage and salary growth and exchange rate movements. In some countries, inflation was already on a downward path when effective monetary control was achieved.

It is well recognised that monetary restraint may lead to a recession in output growth and the experiences of three of these four countries suggest that such a period of recession may be unavoidable. However, the length and severity of the recession depends very much on growth rates in the rest of the world and on other domestic policies.

Long-term interest rates generally move in the same direction as the inflation rate, but in all four countries interest rates have held up at a much higher level than the inflation rate implying a significant increase in 'real' interest rates. The timing of interest rate movements has also varied. In Canada the peak in interest rates coincided with the peak in the inflation rate, while in the United States interest rates peaked 1½ years after the peak in the inflation rate.

More detailed results are set out below on a country by country basis.

## United States

Monetary policy in the United States was tightened significantly in October 1979 when the emphasis of policy shifted from interest rate objectives to money supply objectives.

In October 1979 the Federal Reserve Board announced three measures aimed at obtaining improved control over monetary growth<sup>2</sup>:

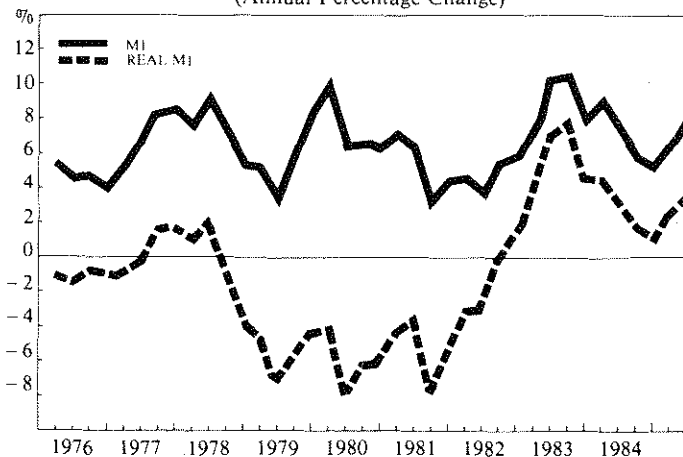
- a change in the techniques of monetary control, with greater emphasis being placed on using open market operations to control bank reserves and much less emphasis on keeping short-run movements of the Federal funds rate within a narrow range;
- a 1 per cent increase in the discount rate to 12 per cent;
- the introduction of a marginal reserve requirement of 8 per cent on selected institutions.

The October 1979 announcement followed the failure of a number of previous measures which had been taken during 1978 to curb inflationary expectations. In particular, the discount rate had been increased from 6 per cent in January 1978 to 11 per cent in September 1979.

### Monetary Conditions

Prior to 1979, M1 had been growing above the Federal Reserve's target range and inflation was growing strongly. Nominal M1 growth peaked two quarters after the change in monetary policy in October 1979 (see figure 1), and thereafter was generally held within a range of 4 — 7 per cent up until early 1982. This growth was significantly negative in real terms.

Figure 1  
GROWTH OF M1 IN THE UNITED STATES  
(Annual Percentage Change)



Source: OECD, *Main Economic Indicators*

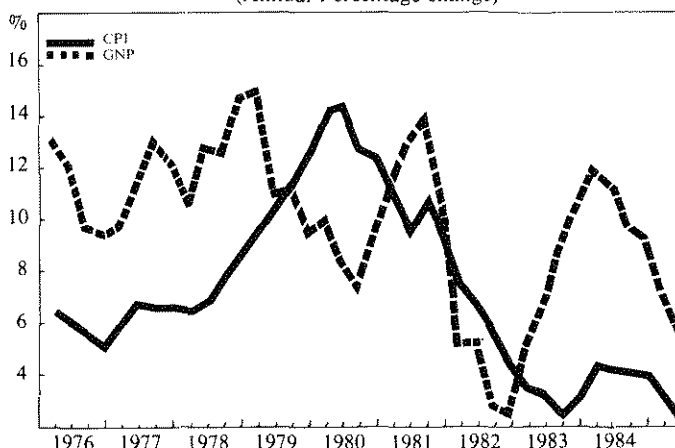
During the second half of 1982 and 1983, real M1 growth increased strongly. However, sharp declines in velocity during 1982/83 offset rapid monetary growth. In both 1982 and 1983 velocity fell by around 3 per cent compared with average velocity growth in excess of 3½ per cent during 1979–81. Late in 1982 the Federal Reserve de-emphasised the importance of M1 measures for monetary policy in favour of M3, by widening the

target range for M1 and introducing a target range on M3. This reflected known distortions to the M1 aggregates. Growth in real M3, at around 6 per cent during 1983/84, was significantly higher than during the previous five years. However, negative growth in velocity again offset much of the impact of the high monetary growth on nominal income.

### Inflation

Increases in the rate of inflation flattened out at just over 14 per cent per annum some three quarters after the change in operating procedures in late 1979 (see figure 2). Within one year, the inflation rate began to fall steadily and dropped to below 5 per cent after three years.

Figure 2  
INCOME AND INFLATION IN THE UNITED STATES  
(Annual Percentage Change)



Source: OECD, *Main Economic Indicators*

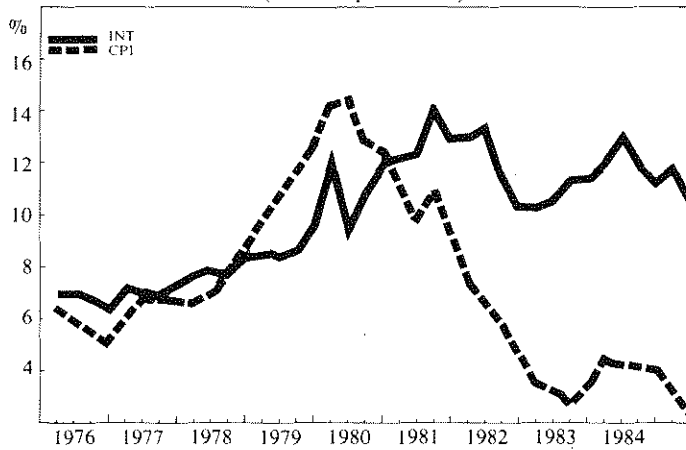
### Income Growth

The pattern of nominal income growth in the United States during 1976–84 is illustrated in figure 2. Growth in nominal income was on a downward path at the time of the October 1979 change in monetary policy and this trend was reinforced by the additional monetary restraint. Real GNP growth fell sharply after the change in monetary policy with negative growth during 1980. Economic growth bounced back in 1981 but was unsustainable and growth became negative again in 1982. Strong growth was recorded again in the second half of 1983 and 1984, coinciding with large increases in the fiscal deficit.

### Interest Rates

The yield on long-term government bonds is shown by the solid line in figure 3. During the first year of the new policy environment nominal long-term interest rates were quite volatile, with an initial sharp increase followed by a decline and then a steady rise again. Interest rates did not peak until two years after the October 1979 announcement — almost 1½ years after the inflation rate had peaked. In late 1982 rates fell sharply by 3 — 4 percentage points but moved back up with the recovery in economic activity through 1983/84. Since 1983, real interest rates have remained at high levels, in the range of 6 — 8 per cent.

**Figure 3**  
**LONG-TERM INTEREST RATES IN THE UNITED STATES\***  
(Per cent per annum)

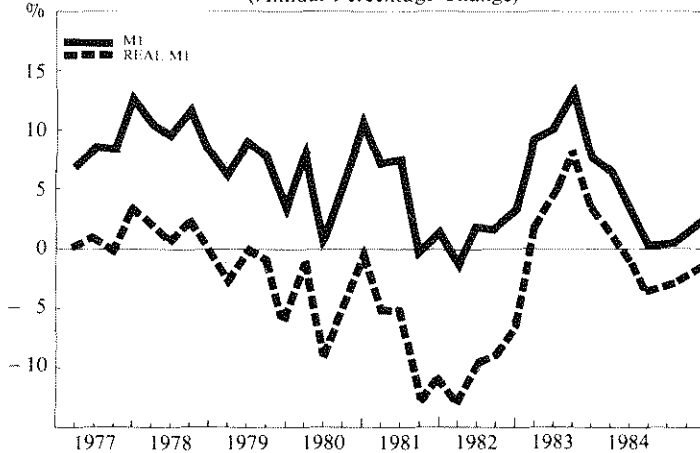


Source: OECD, *Main Economic Indicators*  
\* Yield of long-term (ten years and over) Government Stock

**Canada**

The Canadian monetary authorities recognised the need for slower monetary growth in 1975. Although the Bank of Canada signalled its intention to tighten monetary policy when it announced a target range for M1 in 1975, it has since indicated that monetary policy was probably not truly anti-inflationary until 1979.<sup>3</sup> Inflation did not begin to subside substantially until 1983 — a lag of over 3 years.

**Figure 4**  
**GROWTH OF M1 IN CANADA**  
(Annual Percentage Change)



Source: Bank of Canada, *Review*

**Monetary Conditions**

The years 1979 and 1981 were characterised by sharp reductions in nominal M1 growth compared to 1977/78. The large falls in M1 growth in 1979 and 1981, however, were not necessarily indicative of the change in monetary conditions due to distortions caused by the combined effect of financial innovations and high real interest rates. Growth in M1 velocity averaged close to zero during 1977/78 but jumped to around 6 per cent and 8 per cent per annum in 1979 and 1981 respectively. Similarly, high M1 growth in 1983 was associated with a sharp fall in velocity of about 6 per cent per annum.

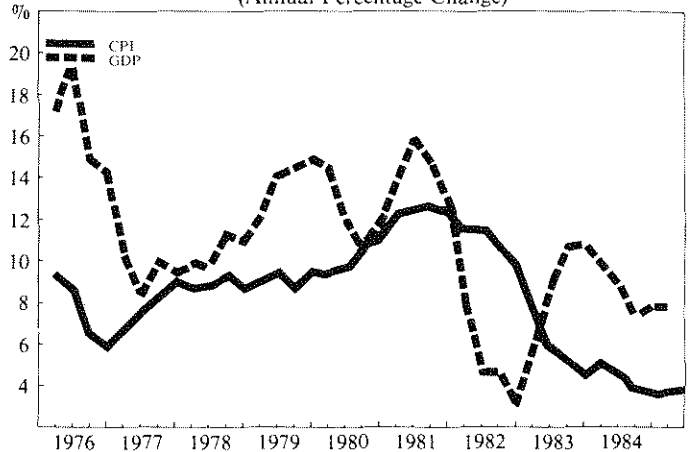
<sup>3</sup> Annual Report of the Governor to the Minister of Finance and Statement of Accounts for the year, *Bank of Canada*, 1980, p.12.

In 1982 the Bank of Canada abandoned targeting M1 in favour of an eclectic approach involving assessment of a range of financial indicators. In its Annual Report of 1981, the Bank of Canada cited instability of monetary aggregates broader than M1 as a major reason for not targeting these aggregates.<sup>4</sup>

**Inflation**

The rate of inflation peaked at just over 12 per cent per annum in mid-1981, after 2-2½ years of restrictive monetary policy (see figure 5). The inflation rate fell below 5 per cent some 4½ years after monetary policy became restrictive. The long delay before inflation peaked is widely attributed to high wage growth and a 20 per cent depreciation of the exchange rate.

**Figure 5**  
**INCOME AND INFLATION IN CANADA**  
(Annual Percentage Change)



Source: OECD, *Main Economic Indicators*

**Income Growth**

The tightening of monetary policy in 1979 led to an initial fall in income growth in the first half of 1980 followed by a return to strong growth in 1980/81. In 1981/82, 2-2½ years after the tightening of monetary policy, nominal income growth fell sharply but recovered to more moderate growth rates in 1983 and 1984. In general, the cyclical pattern of nominal income growth in Canada has followed closely that recorded in the United States.

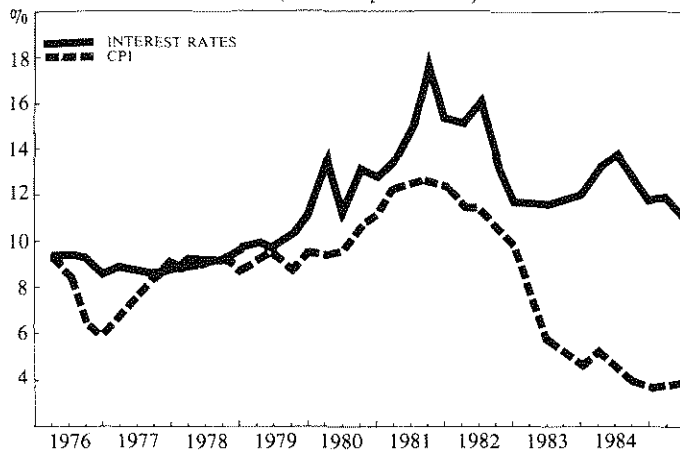
**Interest Rates**

The yield on long-term government bonds peaked approximately 2½ years after monetary policy was tightened (see figure 6), roughly coinciding with the peak in the inflation rate. Interest rates initially fell sharply over 1981/82 but subsequently recovered in line with US rates despite a continuing decline in the inflation rate.

Again, as in the US, real long-term interest rates increased markedly over the 1983/84 period. This coincided with a period of strong economic activity and also a small rise in inflation. Recent statistics for the period up to mid-1985 show that interest rates have since fallen back again.

<sup>4</sup> Annual Report of the Governor to the Minister of Finance and Statement of Accounts for the year, *Bank of Canada*, 1981, p.32.

**Figure 6**  
**LONG-TERM INTEREST RATES IN CANADA\***  
(Per cent per annum)



Source: OECD, *Main Economic Indicators*  
\* Yield of long-term Government Stock

## United Kingdom

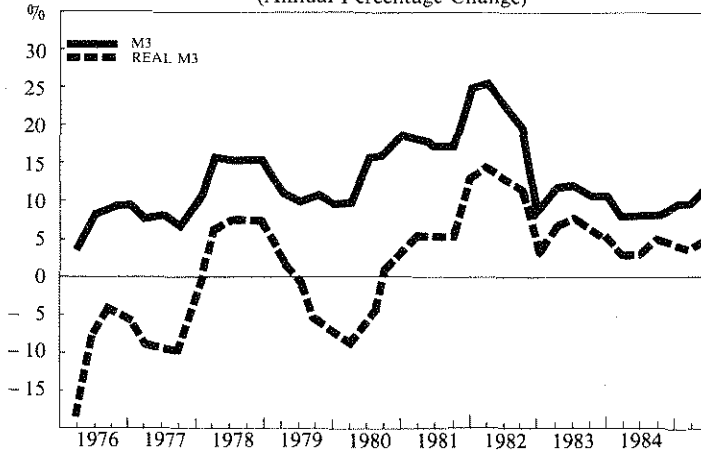
Anti-inflationary financial policies in the United Kingdom since 1980/81 have been guided by the medium-term financial strategy (MTFS). A key feature of the MTFS has been the announcement, for several years ahead, of targets for monetary aggregates and for the public sector borrowing requirement (PSBR) in relation to GDP. The stated goals of policy are:

- a progressive slowing of monetary expansion to bring down inflation; and
- a scaling back of the PSBR to ensure that the slower monetary growth would not result in significantly higher real interest rates.

## Monetary Conditions

In the two years following the introduction of the MTFS in 1980, sterling M3 continued to grow rapidly in both nominal and real terms. Growth of sterling M3 was also distorted early in the period of restraint by

**Figure 7**  
**GROWTH OF M3 IN THE UNITED KINGDOM**  
(Annual Percentage Change)



Source: Bank of England, *Quarterly Bulletin*

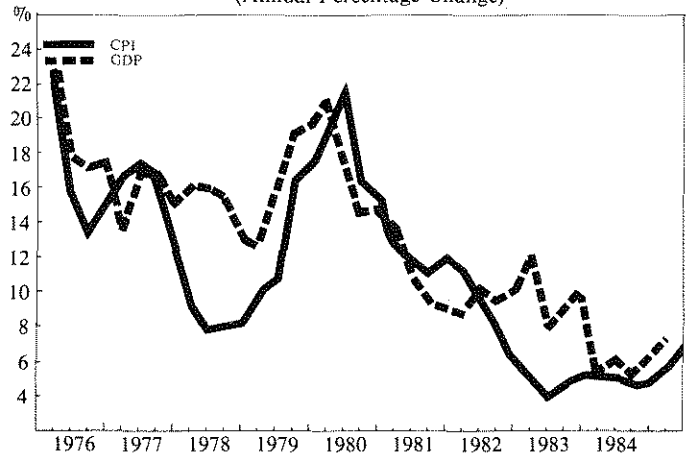
regulatory changes. The income velocity of sterling M3 fell by 5 per cent during 1981 after nil growth in the previous year. Despite these falls in velocity, sterling M3 was brought down by late 1982 to a rate of increase well below the average rate recorded in the late 1970s, although growth in real sterling M3 was still not especially low. Over the period 1983 to mid-1985 growth in sterling M3 has increased steadily to around 12.5 per cent for the June 1985 year. Real M3 growth over this period has averaged slightly less than 5 per cent.

The United Kingdom authorities have introduced targets for new aggregates on two occasions in recent years. The first change came in 1982 when a narrower measure of money, M1, and a broader measure, PSL2, were adopted in addition to the existing sterling M3 target. The targets for M1 and PSL2 were subsequently dropped in 1984 and replaced by a target for monetary base, MO.

## Inflation Rate

The peak in the rate of inflation coincided with the introduction of the MTFS in 1980. The inflation rate fell to around 5 per cent after almost three years (see figure 8).

**Figure 8**  
**INCOME AND INFLATION IN THE UNITED KINGDOM**  
(Annual Percentage Change)



Source: OECD, *Main Economic Indicators*

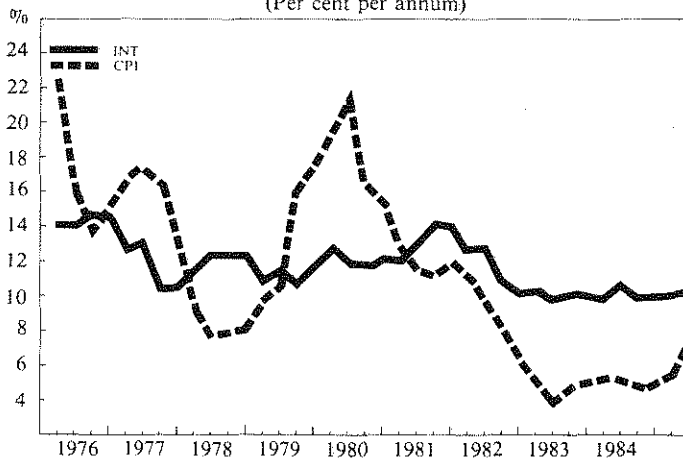
## Income Growth

The introduction of the MTFS also coincided with a period of negative growth in real economic activity. Growth remained negative during much of the period to mid-1982 as both nominal income and inflation declined (see figure 8). In mid-1982, 2½–3 years after the introduction of the MTFS, real economic growth became positive and remained quite strong through to 1984.

## Interest Rates

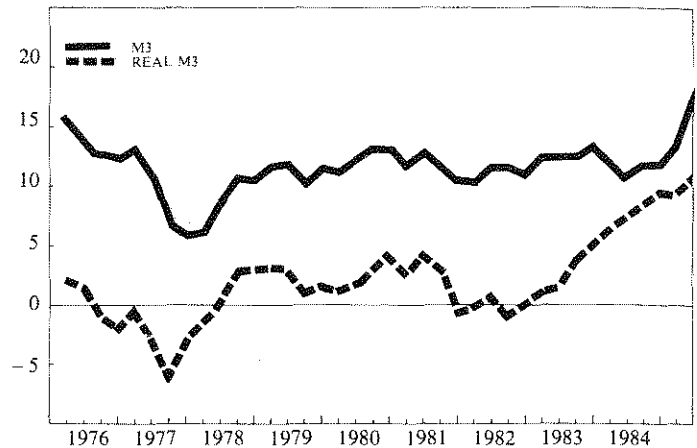
Long-term interest rates in the United Kingdom remained reasonably stable throughout the period 1976–1985 in nominal terms. Falling inflation since mid-1980 was followed by only a modest reduction in yields on long-term government bonds with the result that real interest rates became strongly positive from 1981/82 onwards.

Figure 9  
LONG-TERM INTEREST RATES IN THE UNITED KINGDOM\*  
(Per cent per annum)



Source: OECD, *Main Economic Indicators*  
\* Yield of Government Stock: 2½% consols

Figure 10  
GROWTH OF M3 IN AUSTRALIA  
(Annual Percentage Change)



Source: Reserve Bank of Australia *Bulletin*

## Australia

The Reserve Bank of Australia recognised in 1976 the need to "maintain conditions which keep the overall provision of financial services at a level consistent with sustainable growth in economic activity while bearing down on inflation" (Annual Report, 1978). Between 1974 and 1984 these objectives were embodied in 'projections' for growth in M3 for the year ahead.

The effectiveness of monetary control was initially limited by the presence of interest rate controls and a fixed exchange rate. By late 1983, however, monetary control had become more effective due to:

- the removal of a number of interest rate controls and increases in remaining ceilings in 1981;
- introduction of a tender system for government stock in 1981;
- removal of bank lending guidelines in 1982;
- the float of the Australian dollar in December 1983.

## Monetary Conditions

As in the other countries discussed in this paper, interpretation of the monetary and credit aggregates is made difficult by deregulation and financial market innovations. In particular, the removal of bank lending guidelines and a number of interest rate controls has complicated the interpretation of M3.

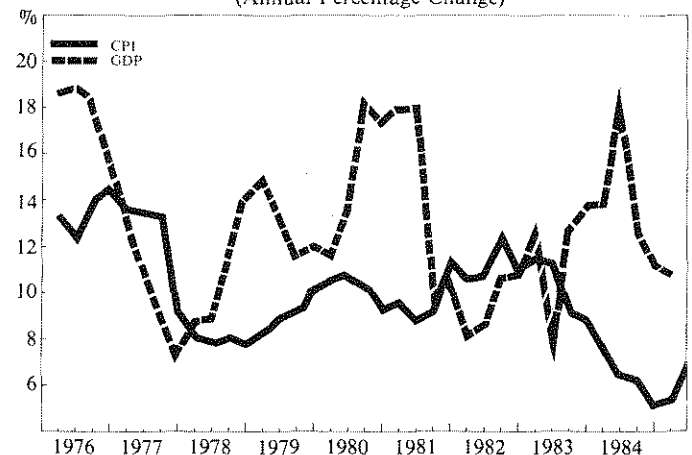
Although the dollar was floated in late 1983 the authorities have as yet been unable to bring about any sustained reduction in M3 growth. Indeed, in the first two quarters of 1985 M3 growth has increased sharply. Growth in real M3 has also remained much higher than during 1976-83. Targets for the annual growth rate of M3 were not published for 1985. This decision reflected the limited institutional coverage of the M3 definition and the resulting interpretation difficulties noted above. The 'broad money' aggregate, which includes a wider range of financial institutions than does M3, grew at around 2 — 3 per cent higher than M3 during 1980-82. In 1983 to mid-1985, however, the gap between M3 and 'broad money' growth closed significantly.

Reserve Bank Bulletin, Vol. 48, No. 11, 1985.

## Inflation

At the time of the float of the Australian dollar in late 1983 the inflation rate was already on a downward path. The inflation rate had subsided to below 5 per cent per annum by mid-1984 but has begun to increase again over the first half of 1985.

Figure 11  
INCOME AND INFLATION\* IN AUSTRALIA  
(Annual Percentage Change)



Source: GDP: OECD, *Main Economic Indicators*  
CPI: Australian Treasury, *Roundup*

\* Adjusted for the introduction of Medicare health insurance in February 1984

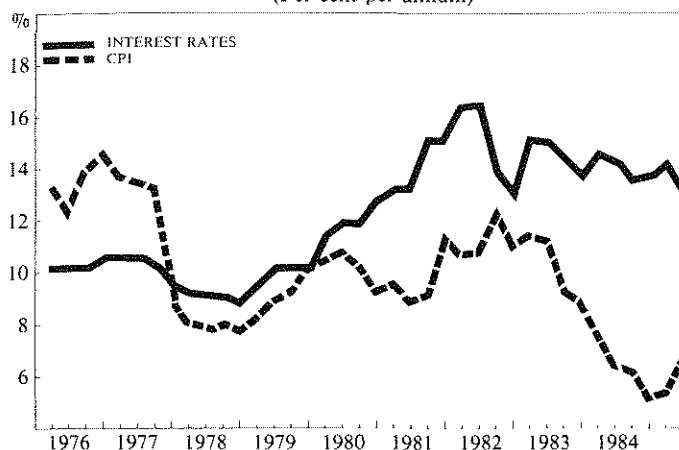
## Income Growth

Nominal income increased significantly above the inflation rate during the first six months of the post-float period, but by mid-1984 had begun falling, though still remaining well above the inflation rate. However, it is still too early to judge whether Australia has been successful in bringing about a sustained reduction in inflation without adversely affecting economic growth.

## Interest Rates

Real interest rates increased significantly during 1981 and 1982 following the removal of interest rate controls and bank lending guidelines. Since the floating of the dollar, long-term interest rates have remained steady in nominal terms, but real rates have shown a further sharp rise as a result of the falling inflation rate.

**Figure 12**  
**LONG-TERM INTEREST RATES IN AUSTRALIA\***  
(Per cent per annum)



Source: OECD, *Main Economic Indicators*

\* Yield of long-term Government Stock. From June 1981, 15 year Treasury bonds: Previously 20 year bonds

## Conclusion

The experiences of the United States, United Kingdom, Canada and Australia suggest that a tightening of monetary policy will reduce real growth in

the main monetary aggregates, but with a potentially significant lag. Financial market innovations and deregulation often result in sharp changes in the velocity of circulation and, as a result, it is possible for the aggregates to continue to grow strongly in the initial stages following a tightening of policy.

The overseas evidence also suggests that a sustainable reduction in the inflation rate is obtainable over the medium-term with a firm monetary policy. However, wage rates and the exchange rate are also important determinants of inflation in the short-term. Higher wage settlements, for example, will tend to slow the rate at which the inflation rate falls. The length and severity of a downturn in economic activity associated with a tighter monetary policy is also affected greatly by factors such as wage rates and the exchange rate.

Finally, the high interest rates currently being experienced in New Zealand have also been associated with tight monetary policies in the United States, the United Kingdom, Canada and Australia. The experiences of these countries suggest that nominal interest rates are likely to fall as inflation is reduced; however, real interest rates are unlikely to fall below world levels which remain high by historical standards.

## APPENDIX

### Definitions of Monetary Aggregates

#### 1. United States

M1: Prior to 1980 M1 was defined as:

- (i) demand deposits at all commercial banks other than those due to domestic banks, the United States Government, and foreign banks and official institutions less cash items in the process of collection and Federal Reserve float; and
- (ii) currency outside the Treasury, Federal Reserve Bank, and the vaults of commercial banks.

Post-1980 M1 has been defined as above plus negotiable order of withdrawal and automated transfer service accounts at banks and thrift institutions, credit union share draft accounts, and demand deposits at mutual savings banks.

M2: M1 plus savings and small denomination time deposits, overnight repurchase agreements (RPs) at commercial banks, overnight Eurodollars held by United States residents, and money market mutual fund shares.

M3: M2 plus large-denomination time deposits and term RPs.

#### 2. Canada

M1: Currency and demand deposits less private sector float.

M1A: M1 plus daily interest chequable and non-personal notice deposits.

M2: M1A plus other notice deposits and personal term deposits.

M3: M2 plus other non-personal fixed-term deposits plus foreign currency deposits of residents booked in Canada.

#### 3. United Kingdom

M0: Notes and coin in circulation with public and banks' till money and operational balances at the Bank of England.

M1: Notes and coin in circulation with public and United Kingdom private sector sterling sight deposits.

Sterling M3: M1 plus United Kingdom private sector sterling time deposits.

M3: Sterling M3 plus United Kingdom private sector deposits in other currencies.

PSL1: Sterling M3 less deposits of over two years' original maturity, plus private sector holdings of money market instruments and certificates of tax deposit.

PSL2: PSL1 plus the more liquid building society shares and deposits and other similar forms of liquid savings instruments.

#### 4. Australia

M1: Currency and current deposits with all trading banks.

M2: M1 plus other deposits with all trading banks.

M3: M2 plus deposits with all savings banks.

Broad Money: M3 plus borrowings from the private sector by NBFIs (non-bank financial institutions), less the latter's holding of cash and bank deposits.