

**THE RELATIONSHIP BETWEEN FINANCIAL INDICATORS  
AND ECONOMIC ACTIVITY: 1968-1987**

Michele Bullock  
Dirk Morris  
and  
Glenn Stevens\*

Research Discussion Paper  
8805

August 1988

Research Department  
Reserve Bank of Australia

\* We have benefited from many comments and discussions within the Bank. But responsibility for the views expressed in this paper rests solely with the authors and not with their colleagues or the Reserve Bank of Australia.

We would like to thank Melanie Henderson for help in preparation of graphs.

## ABSTRACT

This paper is part of a larger project which looks at monetary policy and the economy. The object of the present paper is to serve as an introduction to and description of some key empirical regularities, without seeking to describe how monetary policy exerts its influence, or how this may have changed under deregulation. Other papers are presently being prepared which will address these issues.

The paper examines the relationship between a number of financial indicators and economic activity over the past two decades. The study focuses on private demand as an indicator of activity, and short-term interest rates and a number of financial aggregates as financial indicators.

The paper examines these indicators both visually (graphically) and using simple correlation coefficients. While it does not claim to be definitive about causality, it does draw some conclusions about the strength and timing of relationships. In particular, it suggests that large movements in real demand are preceded by movements in interest rates. The evidence for monetary and credit aggregates is mixed. M1 consistently leads real demand (though this is probably not independent of interest rates). Other bank-based aggregates sometimes led in the 1970s, but no longer do so; the relationship for these aggregates has at times been unstable. Broader monetary and credit aggregates tend to lag real demand.

In the case of nominal demand, the timing of relationships is altered. The leading relationship of interest rates and M1 to nominal demand is longer than it is for real demand, and the lag from demand to broader aggregates is shorter. M3 and bank lending performed very well as leading indicators of nominal demand in the 1970s, but have since deteriorated.

One consistent theme which comes through in the results is that interest rates are a reasonably good leading indicator of changes in demand, particularly real demand. This relationship has not weakened with deregulation; indeed, the statistical evidence suggests that it has strengthened.

## TABLE OF CONTENTS

Abstract	(i)
1. Introduction	1
2. The Indicators	3
(a) Indicators of Activity	3
(b) Financial Indicators	5
(i) Interest Rates	5
(ii) Banking Aggregates	7
(iii) Broader Aggregates	7
3. Financial Indicators and Real Private Demand: Graphical Comparisons	10
(a) Interest Rates	10
(b) Banking Aggregates	11
(c) Broader Aggregates	15
4. Financial Indicators and Real Private Demand: Correlation Analysis	17
(a) Full Sample Results	17
(b) Variation Between Sub-periods	19
5. Financial Indicators and Nominal Private Demand: Graphical Comparisons	24
(a) Growth in Nominal Demand	24
(b) Interest Rates	25
(c) Banking Aggregates	27
(d) Broader Aggregates	29
6. Financial Indicators and Nominal Private Demand: Correlation Analysis	30
(a) Full Sample Results	30
(b) Variation Between Sub-periods	32
7. Conclusion	36
Appendix: Data Sources and Methods	38
References	42
Data Listing	43

# THE RELATIONSHIP BETWEEN FINANCIAL INDICATORS AND ECONOMIC ACTIVITY: 1968-1987

Michele Bullock, Dirk Morris and Glenn Stevens

## 1. Introduction

This paper examines the relationship between movements in various financial indicators and movements in measures of economic activity. The financial indicators include interest rates and a range of financial aggregates; the measures of activity are confined to changes in real and nominal private final expenditure. The study is based on quarterly Australian data over the past two decades. It is, therefore, mostly concerned with short to medium-term relationships.

The relationship between financial variables and economic activity can be examined in a variety of ways. One common approach has been to estimate simple demand functions for money, or to examine various measures of the velocity of circulation. Other approaches involve more sophisticated single-equation techniques, or full-system econometric modelling. Most of these have been used in the Bank over recent years.<sup>1</sup>

The present paper is less ambitious than those studies. It is essentially an exercise in data exploration and description, and it uses two simple and direct empirical techniques: graphical comparison of the movements in financial variables (interest rates and financial aggregates) with movements in private demand, and simple correlation coefficients of the same variables. The aim is to see which variables have had a reasonably reliable relationship with private demand over the four business cycles that have occurred over the past

---

<sup>1</sup> Recent Reserve Bank work examining the stability of the demand for money includes Stevens, Thorp and Anderson (1987), and Blundell-Wignall and Thorp (1987). Recent work on the timing of the relationships between financial aggregates and economic activity has used vector-auto-regression techniques, such as in Bullock, Stevens and Thorp (1988). A generation of large-scale econometric models developed in the Bank gave an important and direct role to money in the determination of spending. The structure of the RBA82 version of the model is set out in Fahrer, Rankin and Taylor (1984). More recent development work is detailed in Edey, Kerrison and Menzies (1987).

two decades, and to see the degree to which movements in financial variables lead or lag movements in private demand. The paper focuses first on the extent to which changes in real private demand are associated with changes in financial conditions. While traditional monetary theory suggests that changes in, for example, the nominal quantity of money have no lasting effect on real activity, it is widely accepted that financial variables can affect real demand in at least the short run.

To complete the analysis, the same set of comparisons and tests are also conducted for nominal private demand. This allows for the possibility that the timing of the relationship between financial variables and private demand might be different for the quantity and price components.

The paper does not, however, attempt to explain how financial institutions react to varying financial conditions or to changes in monetary policy. Nor does it spell out the transmission mechanism by which a change in monetary policy affects financial variables, and real activity and prices. These subjects will be covered in later papers which draw on the data and empirical evidence contained in the present study. In fact, the paper says very little about causality. The aim is more limited: to examine the properties of the financial variables as indicators of economic activity.

As well as looking at average relationships over the two decades, the paper also looks at whether the relationships have changed. Over the past two decades, the Australian financial system has moved from being heavily regulated to being largely deregulated. Many of the relationships which held during the early, heavily-regulated part of the period might have changed by the end of the period, when substantial deregulation had taken place.

The paper is in seven sections. The next section describes the variables examined in the paper. Section 3 contains graphical analysis of how the financial variables have moved relative to real private demand. Section 4 supplements this with some simple statistical correlations. Sections 5 and 6 repeat this analysis for nominal private demand. The conclusions are given in the Section 7. An appendix gives details of data and material not covered in the text.

## 2. The Indicators

### (a) Indicators of Economic Activity

There is a range of indicators of economic activity which might be used in a study such as this. Previous Australian empirical work has used industrial production, labour force data, national accounts aggregates or combinations of variables as reference cycles.<sup>2</sup>

In the present paper, to keep the analysis manageable, and to relate the financial indicators to easily recognisable and accessible indicators, attention is confined to national accounts aggregates. In particular, it concentrates on measures of private final spending (i.e. private consumption and investment, including dwelling investment).

Another possible indicator of activity is GDP. Figure 1 shows GDP and private demand, both in real terms, over the twenty-year period 1968-1987. The line in the upper part of each panel shows an index of the level. The line in the lower part of each panel shows quarterly growth, and the black bars a smoothed series<sup>3</sup> for the growth rate.

A couple of similarities between the two measures are clear: the series grew at similar rates over the period as a whole (average annual rates in excess of 3 per cent); both encountered temporary interruptions to the upward trend (the shaded areas represent periods of decline in private demand). But there are important differences. From Figure 1, downturns in demand are invariably more severe, and usually longer lasting, than those in GDP.

It might be argued that GDP is more appropriate than private demand, since it is a more complete measure of activity. On the other hand, because it is a broader measure, it also reflects many other factors besides financial conditions. In particular, net exports, government spending and farm production all have important influences on GDP, but are likely to show little short-run relationship to domestic financial conditions. Accordingly, the reference cycle used in the

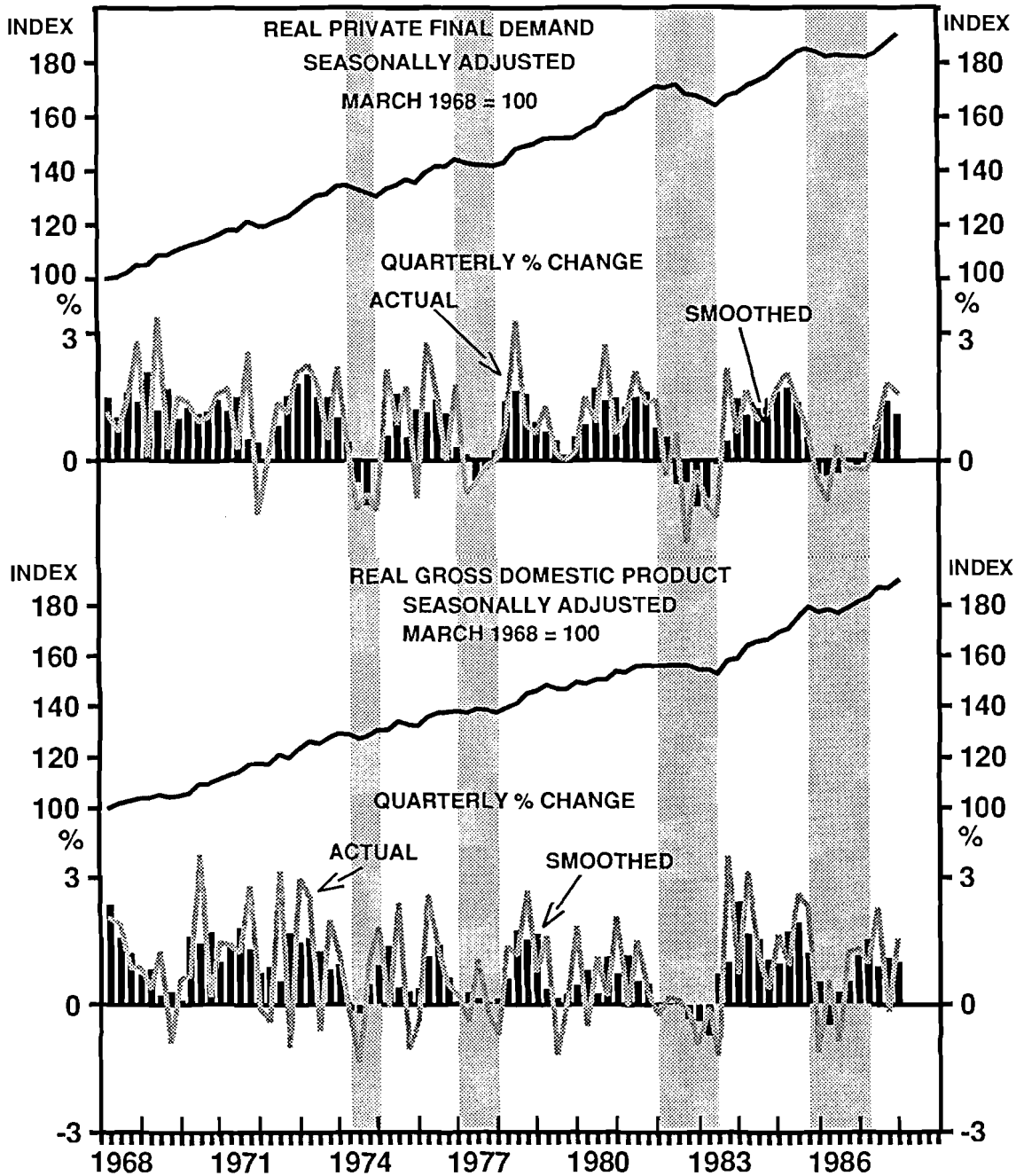
---

<sup>2</sup> See for example Davis and Lewis (1977), Sharpe (1975), Beck, Bush and Hayes (1973), Boehm and Defris (1977) and Boehm (1987).

<sup>3</sup> The series is smoothed by taking a three-quarter, centred moving average. See the Appendix for more details.

remainder of this paper is growth in private demand<sup>4</sup> The smoothed growth rate (black bars in figure 1) is used for the graphical comparisons, and the actual growth rate for the correlations.

FIGURE 1: INDICATORS OF ECONOMIC ACTIVITY



4

All the empirical work has also been done using GDP as a reference cycle. There are some differences in the results, reflecting the above factors. The more substantive of these are noted in the text or in footnotes at the relevant point.

There were four major interruptions to the upward trend in private demand - in 1974/75, 1977/78, 1982/83 and 1985/86. In each period there were several quarters in which private demand declined. These periods are usually accepted as recessions. There were two other episodes of slowing in growth - in 1971/72 and 1978/79. Although in the first episode there was one quarter of negative growth, in the second episode there were none; in neither period did the smoothed series for domestic demand show a fall. There was also one isolated fall in private demand in the fourth quarter of 1975, but this is probably best regarded as an aberration because the periods immediately to either side showed strong quarterly growth rates.

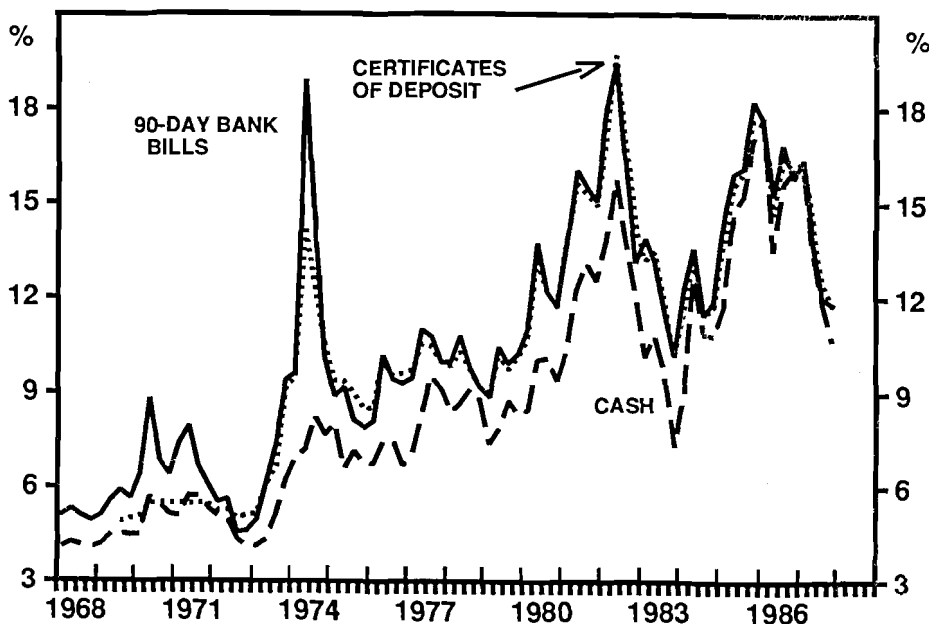
### (b) Financial Indicators

The financial variables used in the study are of three types - interest rates, banking aggregates, and broader financial aggregates that include the liabilities or assets of both banks and non-bank financial institutions.

#### (i) Interest Rates

The study uses short-term interest rates as one indicator of financial conditions. Figure 2 illustrates the 90-day bill rate, the weighted average rate on banks' certificates of deposit, and the weighted average

FIGURE 2: SHORT-TERM INTEREST RATES





rate paid by authorised dealers in the short-term money market on overnight deposits. Clearly, for most of the period, these rates move together.

Accordingly, only one interest rate variable is used - the yield on 90-day bank-accepted bills (henceforth "the bill rate"). This is the main indicator of short-term interest rates in Australia. The bill market is very deep and yields are clearly market-determined and have been so over nearly all of the period under consideration. The bill rate has a direct impact on the cost of short-term funds to financial institutions. As is clear from the graph, the bill rate has moved closely with the rate on certificates of deposit since the deregulation of those rates in 1972. Hence, it is a good indicator of the cost to banks of short-term professional funds. The bill rate is also the major indicator of the cost of funds to merchant banks.

The other very important short-term interest rate for financial intermediaries is the rate on call and overnight funds (the "cash rate"). Unfortunately, this was not representative of short-term interest rates in general in the early part of the period because banks were excluded from this part of the short-term money market until August 1984. The yield on Treasury notes is not used in the study because for much of the period it was not market-determined.

The other issue of importance is whether to use a nominal or a real interest rate. Most of the analysis conducted in this paper uses the nominal rate. One question that might be raised is whether nominal rates are an accurate reflection of the true cost of borrowing in periods such as the mid 1970s, when inflation was high and variable. On the other hand, use of the real rate for analysis and description is complicated by the difficulty of measuring the expected rate of inflation. For the 1980s, when inflation was relatively stable, movements in the real rate were dominated by movements in the nominal rate, so it makes little difference which is used. One simple measure of the real rate of interest is brought into consideration where relevant.<sup>5</sup>

---

5. It is defined as the nominal interest rate less the four-quarter ended change in the consumer price index for the same quarter.

## (ii) Banking Aggregates

Three aggregates based mainly on banks' balance sheets are used. They are:

- . M1, which is the sum of the public's holdings of currency plus current deposits of trading banks. This is the closest approximation to the "transactions medium" of traditional monetary theory;
- . M3, which is the sum of the public's holdings of currency plus all deposits with banks (trading and savings banks). This series was the focus of monetary policy between 1976 and 1984, when conditional projections were announced at Budget time; and
- . bank lending to the public, which is banks' loans, advances and bills discounted.

Both M3 and bank lending are approximately adjusted for the effects of transfers of deposits and loans when major non-bank financial intermediaries became banks,<sup>6</sup> and the effects of foreign bank entry. This removes distortions created by changes in policy relating to bank entry. Effects not caused by such policy changes - for example the winning of business from non-banks by banks - will still be reflected in the data. M1 has not been so adjusted, but this is of little empirical significance since all of the large new banks were savings banks, whose deposits are not included in M1.

## (iii) Broader Aggregates

Three aggregates based on the sum of banks' and non-bank financial institutions' balance sheets are used. These series are only available from 1976 when the statistical collections under the Financial Corporations Act started. The three aggregates are:

- . broad money, defined as the public's holdings of currency, bank deposits and borrowings from the public by non-bank financial institutions;
- . lending by all financial intermediaries (loans, advances and bills discounted), henceforth called "lending"; and

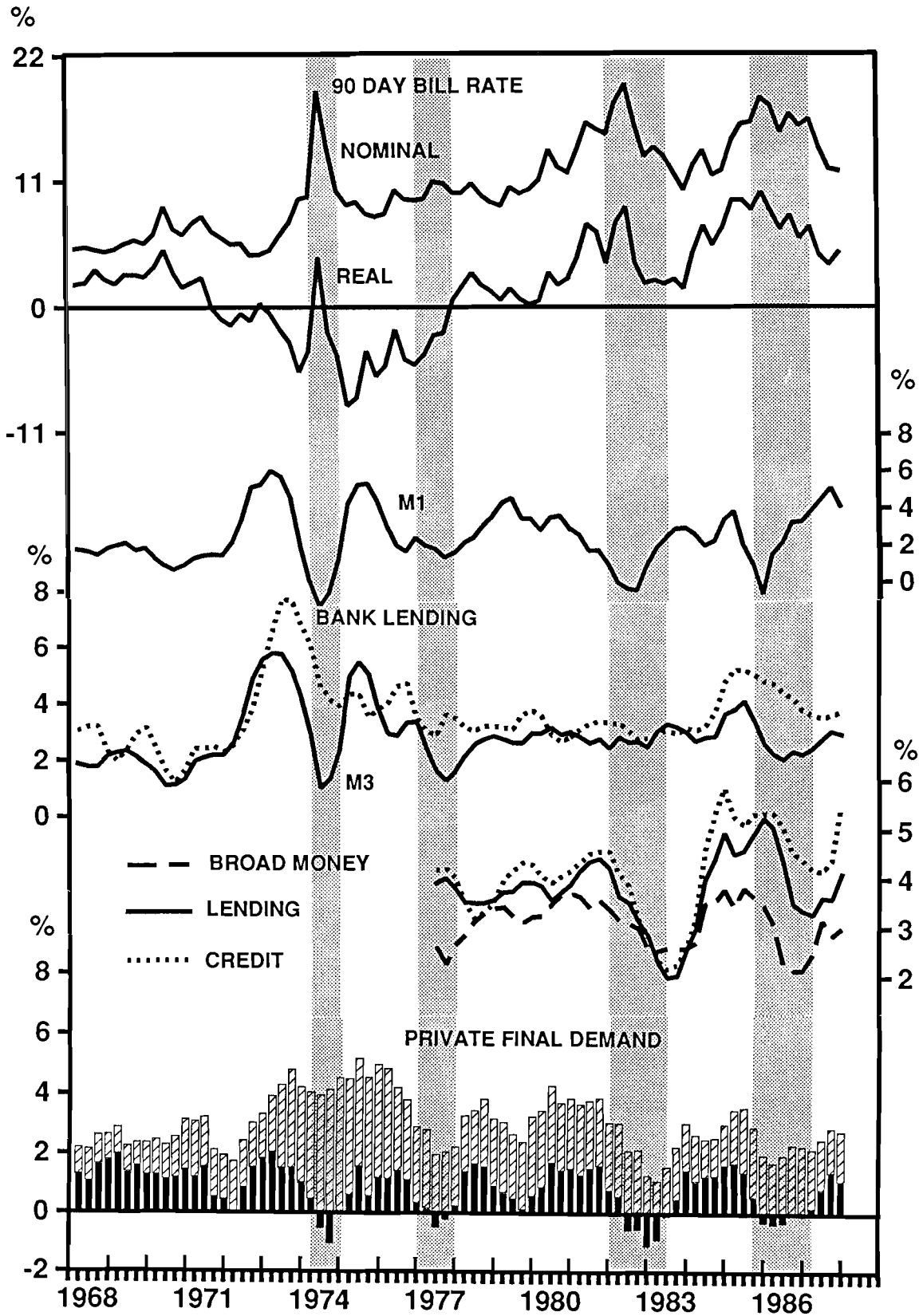
---

6. Details of the procedure used are given in the Appendix.

credit, which is lending plus bank-accepted bills outstanding (other than those discounted by financial intermediaries). Put another way, this is all intermediated lending to the public plus the major form of securitised lending.

Figure 3 assembles the range of financial indicators (levels of interest rates and quarterly growth rates for the aggregates) for the period 1968-87. The bars show growth in nominal demand, with the black part of the bars the portion due to real growth. All financial aggregates and demand have been smoothed using a simple moving average.

FIGURE 3: FINANCIAL INDICATORS AND ACTIVITY



### 3. Financial Indicators and Real Private Demand: Graphical Comparisons

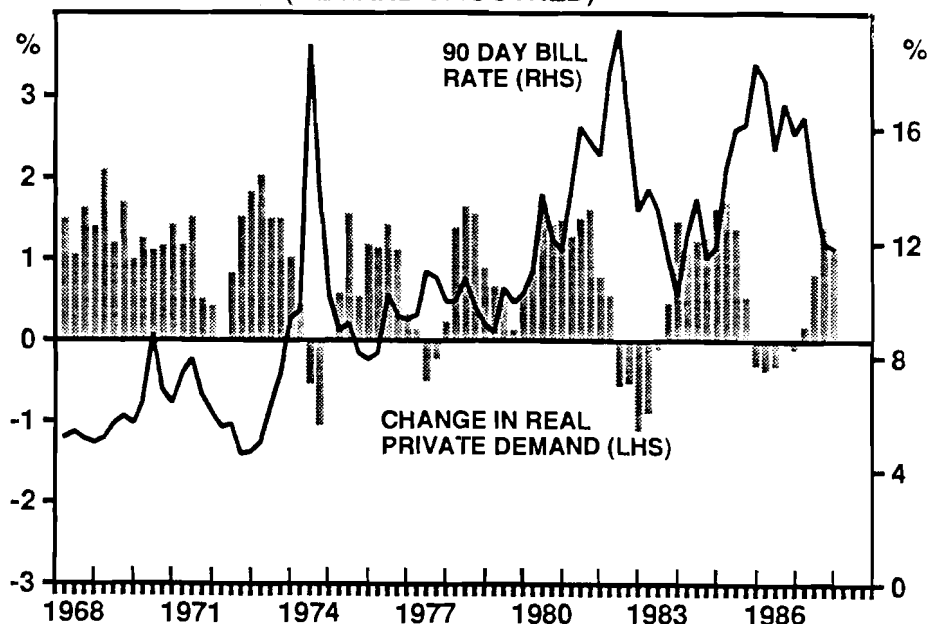
This section compares each financial indicator in turn with real private demand. In each graph, the bars represent quarterly growth in the smoothed series for real private demand.

#### (a) Interest Rates

Figure 4 shows the nominal bill rate and movements in real private demand. The relationship is clouded by an upward trend in interest rates for much of the 1970s. This can be attributed to a slow adjustment to the much higher rate of inflation which prevailed during that period than in the 1960s. There was a marked downward trend in real interest rates in the first half of the 1970s, and real rates were only just positive at the end of the 1970s (see figure 3).

Despite this, there is a clear inverse relationship between nominal interest rates and changes in real private demand. In particular, the three major falls in private demand - 1974/75, 1982/83 and 1985/86 - corresponded to the three major peaks in short-term interest rates. The slowdown of 1977/78 was also accompanied by a rise in the bill rate, but the relationship was weaker. There was also a small peak in the bill rate in 1970 which was not associated with a fall in demand, although there was a slowing in the rate of growth.

**FIGURE 4: INTEREST RATES  
AND REAL PRIVATE DEMAND  
(DEMAND SMOOTHED)**

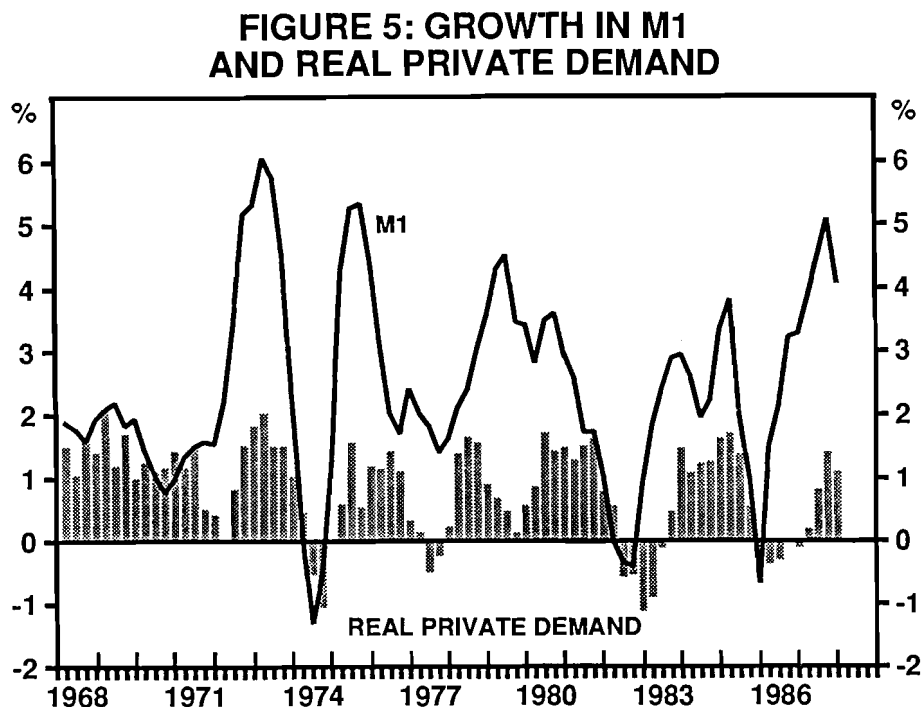


Apart from the small rise in 1970, the bill rate did not indicate any "false turning points". Occasions where the bill rate showed a major rise were always associated with a fall in real private demand and major falls in the bill rate were consistently associated with a rise in demand.

There is also evidence from the graph that interest rates often tended to lead economic activity. This is particularly clear in the 1982/83 and 1985/86 episodes, where interest rates had been rising for some time before demand slowed and eventually fell. The slowdown in 1976/77 was also preceded by a rise in rates, though the relationship was coincident in 1974/75. In all these instances, the bill rate reached its peak in the first quarter that demand fell, and the decline in the bill rate led the pick-up in demand.

#### (b) Banking Aggregates

Movements in M1 appear to be closely related to movements in real private demand. This is shown in Figure 5. The three sharpest contractions in growth of M1 (where M1 in fact declined in absolute terms) corresponded with the three major falls in real private demand. Also, there was a slowing in 1977/78, corresponding with the slight fall in private demand at that time.

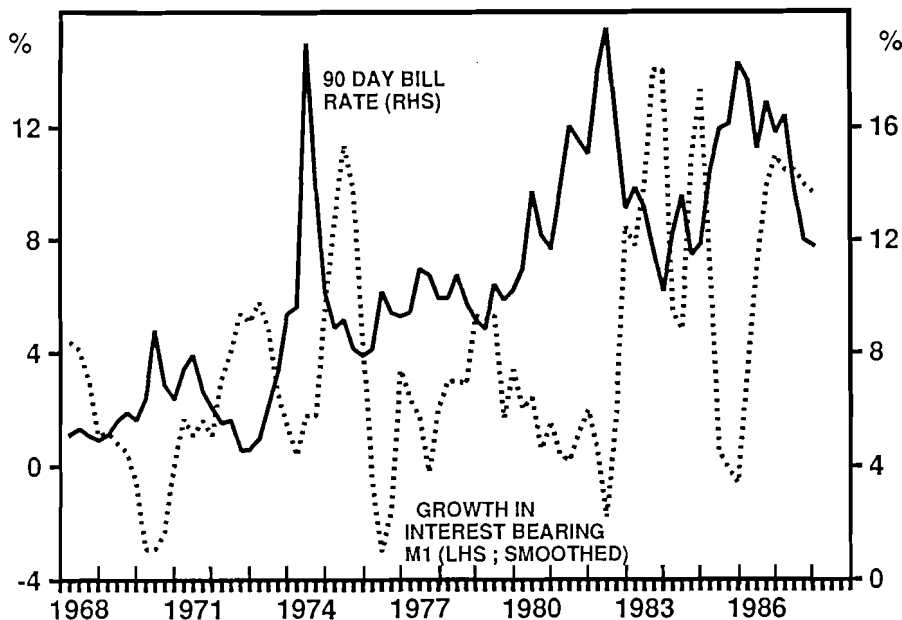


However, M1 does not appear to have performed in its usual manner in the most recent cyclical upturn, where its growth has been exceptionally strong. By 1987, M1 was growing at an annual rate of over 20 per cent, its highest rate since the early 1970s. This was noticeably faster, relative to the growth of real private demand, than in either of the two previous expansions.

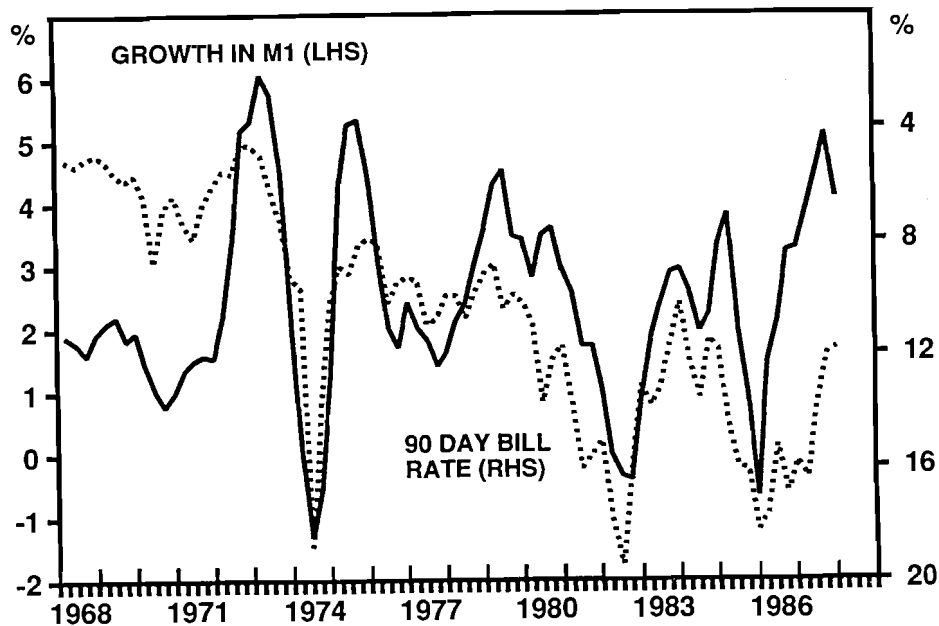
Visually, it is difficult to detect whether the bill rate or M1 has the better cyclical relationship with real private demand. The comparison is made more difficult by the fact that the growth of M1 is heavily influenced by movements in interest rates, since the opportunity cost of holding M1 increases with rising interest rates. Holders of bank deposits are able to switch relatively easily between M1 (predominantly non-interest bearing deposits)<sup>7</sup> and the other components of M3 (predominantly interest bearing) in response to changes in interest rates. Figure 6 shows that there is a very strong (negative) association between interest rates and M1. This being so, there is a possibility that movements in M1 do not provide independent information, but are mainly a reflection of already observed movements in interest rates.

- 
7. Removal of bank interest rate and maturity controls has raised the share of interest bearing deposits in M1 in recent years, to around 20 per cent by end 1987. But, as the graph below shows, even the interest-bearing component appears to be sensitive to market interest rates.

INTEREST BEARING M1 AND INTEREST RATES



**FIGURE 6: M1 AND INTEREST RATES**  
(INTEREST RATES ON A NEGATIVE SCALE)



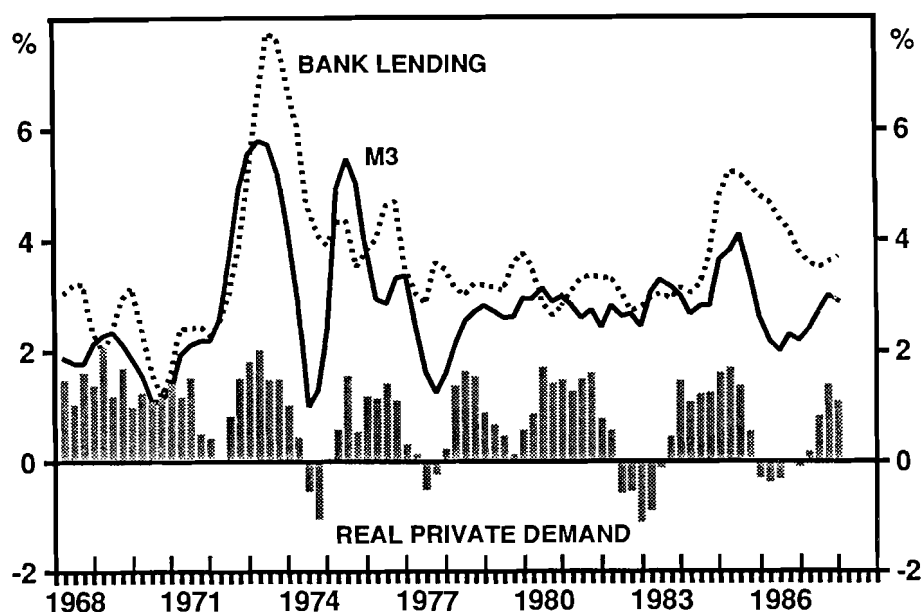
The relationship between M3, bank lending and real private demand is shown in Figure 7. For M3, the relationship seems quite strong for the falls in demand in 1974/75 and 1977/78. There is also a good "fit" for the expansions in the early and mid 1970s.

However, the similarity of movement between M3 and real private demand broke down at the end of the 1970s. There was little variation in M3 growth from 1978 to 1983, although demand grew strongly in the early part of the period and fell sharply during the recession of 1982/83. Similarly, there was very little pick-up in M3 growth during the strong expansion in real private demand of 1983 and 1984. More recently, the relationship has looked better. In the slowdown in 1985/86 and the subsequent pick-up, M3 seemed quite good in its relationship to demand, although the lowest growth rate reached was noticeably higher than in the 1974/75 or 1977/78 slowdowns.

From figure 7 then, it is apparent that a close monitoring of M3 growth over the last decade has been helpful in predicting (or confirming) major movements in economic activity on some occasions, but unhelpful on other occasions. For example, in the most severe post-War recession (1982/83), it was of no help at all.



**FIGURE 7: GROWTH IN M3, BANK LENDING AND REAL PRIVATE DEMAND**



The dotted line in Figure 7 shows growth in banks' lending to the private sector. It shows a similar pattern to M3 but, if anything, has an inferior "fit". It correlated well with real private demand over the expansion and contraction phases of the early 1970s but by the mid 1970s, when demand was very weak, bank lending was still growing very quickly. Its relationship to the fall in private demand in 1977/78 was not as close as for M3. It showed the same deficiency as M3 in the 1982/83 episode, and was noticeably less useful than M3 in 1985/86.<sup>8</sup>

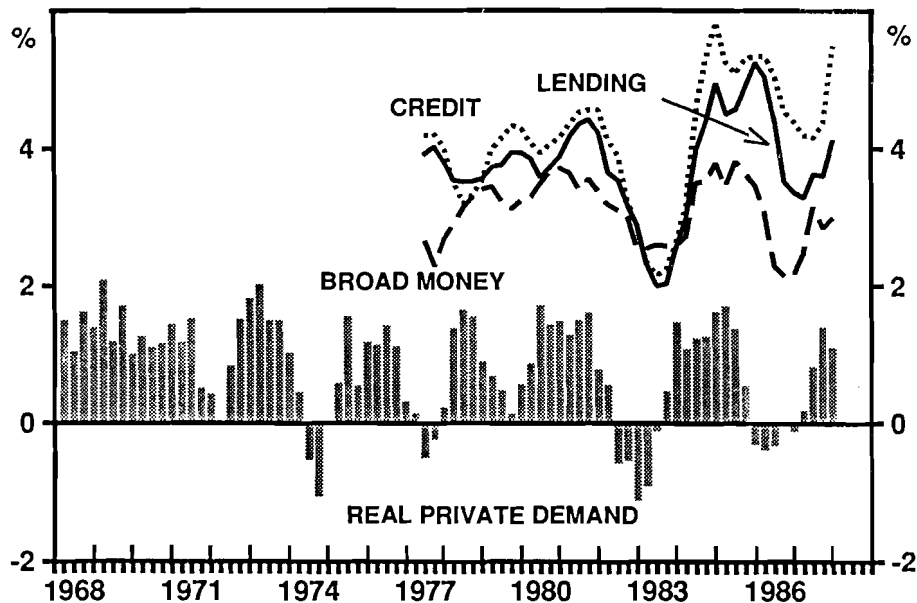
- 
8. There was a considerable divergence between growth of M3 and bank lending in 1985 and 1986, with lending growing much more quickly. In earlier periods, such as the mid 1970s, such differences were due to changes in holdings of LGS assets by banks. This was not the explanation in 1985-1986. The rapid growth of lending was financed in part by liabilities other than conventional \$A deposits. In particular, new foreign banks funded part of their lending with capital, and banks (particularly the new ones) also increasingly used foreign currency borrowings (not included in M3). Declines in holdings of local and semi-government securities by savings banks (associated with changes in Prescribed Assets Ratio regulations) were also a factor. In other words, bank lending would appear to be a better indicator of movements in banks' balance sheets than M3 over this period.

(In 1986, bank lending was still growing at a faster rate than at virtually any time since the mid 1970s.)

(c) Broader Aggregates

Due to data limitations, there are only two cycles over which it is possible to compare movements in the broader aggregates and demand (figure 8). However, over this restricted period, it is clear that there was a good correspondence between the cycles in broader aggregates and in real private demand. The two falls in demand and the three expansions were reflected in corresponding movements in each of the three broader aggregates. There is also evidence of a relationship in the more moderate cycle in demand in 1979/80. Over the period since 1976/77 as a whole, the broader aggregates seemed to "fit" the movements in real private demand much more closely than did M3 or bank lending.

**FIGURE 8: GROWTH IN BROADER AGGREGATES AND REAL PRIVATE DEMAND**

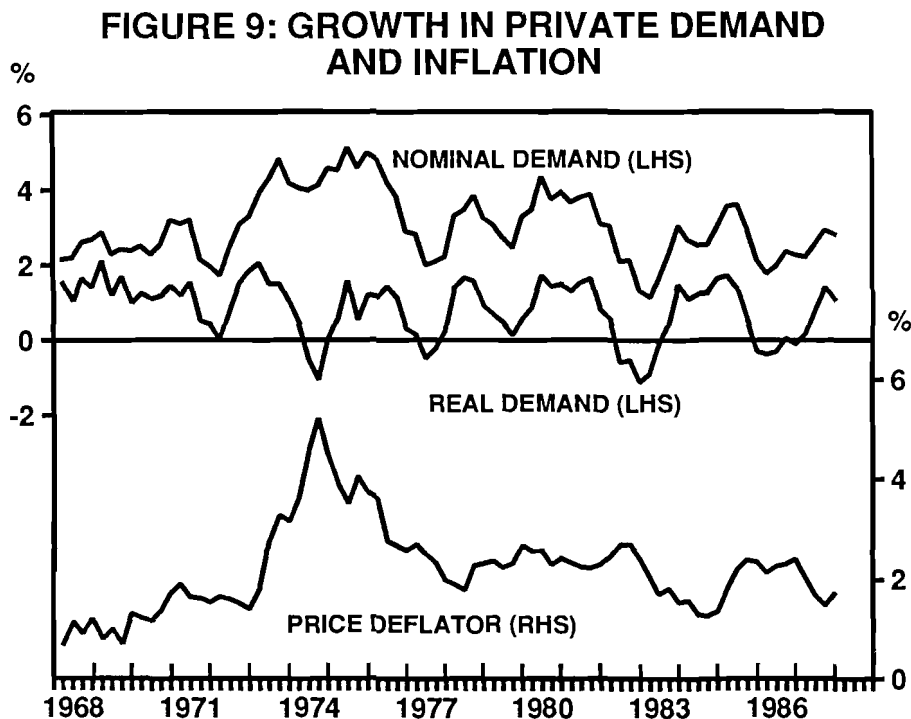


The other feature that stands out from figure 8 is that the movements in broader aggregates tended to lag movements in real private demand. For example, the trough in the broader aggregates in the 1982/83 downturn was not reached until demand had already fallen for four quarters and was beginning to rise again. The same situation

---

occurred in 1985/86. If anything, lending and credit showed a greater tendency to lag than did broad money. The extreme was during the most recent downturn where credit did not reach its trough until the downturn in private demand had finished and the upswing was well underway.

There is some evidence of a shift in the relationship between lending and credit and demand in recent years. At its low-point in the most recent downturn, growth of credit was still running at an annual rate of about 18 per cent, which was higher than at most points in the previous expansion. The trend increase in use of bill financing, and its rapid expansion over the past three years, accounts for part of this change in relationship. Lending, which only includes loans that are funded on financial intermediaries' balance sheets, also exhibited particularly high growth over the recent cycle. Broad money did not suffer from this deficiency, because some of the growth of lending on intermediaries' balance sheets was funded by liabilities that do not show up in broad money.<sup>9</sup>



9. Broad money was affected by the same factors which hold growth of M3 below bank lending, namely the rapid growth of non-A\$ and non-deposit liabilities. Borrowing from parent companies offshore by NBFIs was also a factor.

#### 4. Financial Indicators and Real Private Demand: Correlation Analysis

This section augments the graphs shown in the previous section by calculating simple correlation coefficients between each financial variable and real private demand. As well as helping to quantify the strength of the relationship between the pairs of variables, it also provides a simple quantitative test of whether a particular variable leads or follows private demand. The section is in two parts. Part (a) gives results for the complete data period; part (b) gives results for selected sub-periods.<sup>10</sup>

##### (a) Full Sample Results

Table 1 summarises the results of tests to see whether each financial variable has a coincident or leading relationship with real private demand. The first column shows the correlation coefficients between current movements in demand and the current movements in the various financial indicators. The second column shows the correlation between the current movement in private demand and the movement in the financial indicators in the previous period, and so on.

The top row of Table 1 shows that the first five correlation coefficients between interest rates and domestic demand are all significant and of the expected (negative) sign. Not only are the current quarter's interest rates correlated with current private demand, but interest rates as long ago as a year are correlated with private demand. Expressed in a different way, a change in interest rates is associated with changes in private demand in the same quarter, and over the next year.

M1 also has a significant relationship to private demand, with M1 in the current quarter, and in the previous two quarters, positively correlated with demand. This establishes a clear leading relationship for M1, consistent with the graphical evidence. On balance, the relationship is not as strong for M1 as it is for interest rates. The correlation coefficients are a little smaller, and the lead time between

---

10. The formula for the correlation coefficient is given in the appendix, along with notation on how significance levels are calculated.

movements in M1 and movements in private demand is shorter than for interest rates.

Table 1: Correlation Coefficients Between  
Financial Indicators and Real Private Demand

Variable	Lead in Quarters(b)					
	0	1	2	3	4	5
Bill rate	-.37**	-.40**	-.39**	-.29**	-.25**	-.18
M1	.31**	.32**	.27**	.11	.05	-.04
M3	.26**	.17	-.01	-.15	-.22*	-.05
Bank lending	.09	-.04	-.15	-.28**	-.39**	-.24**
Broad money(a)	.37**	.14	.23	.09	-.02	.13
Lending(a)	.09	.14	.11	.08	.04	-.05
Credit(a)	.05	.15	.11	.08	.06	-.05

- (a) The estimation period for these variables is from 1976-87. The others are for the full period of 1968-87. All financial aggregates and demand are in percentage change form, seasonally adjusted.
- (b) An asterisk indicates significance at the 10 per cent level; two indicates the 5 per cent level.

The results for M3 are noticeably weaker. The only significant coefficient of the correct (positive) sign is the coincident one, and its value is lower than for either M1 or interest rates. There is a significant coefficient on the fourth lead, but it is of the wrong sign. Bank lending is less satisfactory than M3, as there are no significant correlations of the correct sign (although there is a sequence with the wrong sign at leads from three to five quarters).

Among the broader aggregates, the results are also weak; the only significant coefficient is a coincident one between broad money and private demand. Neither lending nor credit show a coincident correlation at all.

An obvious explanation is that the broader aggregates do not lead demand, but lag it. Table 2, which contains correlation coefficients between lags of real private demand and current movements in the broad aggregates, confirms this. Most of these coefficients are significant and positive, i.e. movements in private demand occur

before the associated movement in the financial aggregates. The strongest results are for lending. This supports the visual evidence that broad financial aggregates have a strong pro-cyclical behaviour, but lag the cycle in private demand.

Table 2: Correlation Coefficients Between Real Private Demand and Financial Indicators

Indicator	Lag in quarters(b)				
	1	2	3	4	5
Bill rate	-.25**	-.13	-.05	.00	.06
M1	.21*	-.16	-.24**	-.31**	-.36**
M3	.24**	.04	-.24**	-.19*	-.22*
Bank lending (a)	.07	.10	.03	.07	.04
Broad money (a)	.43**	.36**	.39**	.26*	-.19
Lending (a)	.30*	.44**	.51**	.49**	.24
Credit	.25*	.38**	.45**	.46**	.19

- (a) The estimation period for these variables is from 1976-87. The others are for the full period of 1968-87. All financial aggregates and demand are in percentage change form, seasonally adjusted.
- (b) An asterisk indicates significance at the 10 per cent level; two indicates the 5 per cent level.

#### (b) Variation Between Sub-Periods

The period over which these relationships have been tested contains major structural changes in the financial system; it has moved from being heavily regulated to being largely deregulated. This change occurred in a number of steps over the period; a full account of the various changes will be contained in a later paper in this series.<sup>11</sup>

Any division of the two-decade period into regulated and deregulated sub-periods will inevitably be partly arbitrary. For the present purposes, the major division has been made at December 1980. This

---

11. "Deregulation and the Behaviour of Financial Institutions", Research Discussion Paper, (forthcoming).

was when all interest rate controls on bank deposits were removed. The period from 1968 to 1980 is regarded as being predominantly regulated and the period from 1980 to 1987 as predominantly deregulated. Within the latter period, the sub-period December 1983 to December 1987 corresponds to a further step in deregulation when the Australian dollar was floated, maturity restrictions on bank deposits were removed (in 1984) and open market operations became the main technique for implementation of monetary policy.

Table 3 shows correlation coefficients for those sub-periods. Like Table 1, it tests only for coincident and leading relationships between financial variables and real private demand.

The top panel shows results for the relationship between interest rates and real private demand. In all three sub-periods, there is a significant coincident and leading relationship with private demand. The strength of this relationship (indicated by the size of the correlation coefficients) increases in the more recent sub-periods. The correlations between real private demand and interest rates at leads from one to four quarters are the strongest identified in the various tests in this paper.<sup>12</sup>

The second panel shows results for the relationship between M1 and real private demand. Overall, the relationship is not as strong as that between interest rates and demand. It looks marginally stronger in the post-1980 period, with larger coefficients and slightly improved significance levels. It then seems to deteriorate post-1983, with coefficients noticeably less significant. This is consistent with the discussion of the graphical evidence that suggested some recent shift in the relationship between M1 and demand.

Somewhat surprisingly in view of the visual evidence, the correlation coefficients for M3 suggest that there has been no deterioration in its relationship with real private demand. The correlation is not as strong as for interest rates or M1 in the early period, and it has no leading characteristics, but it has not deteriorated on the basis of evidence in Table 3. In fact, the results suggest that the

---

12. It should be noted that the results for the last sub-period are not as strong when real GDP is used as the indicator of activity rather than private demand.

contemporaneous correlation has strengthened over the most recent period.

But it is clear from the graph that shifts in the relationship between M3 and activity that have occurred within our sub-samples, notably in 1982/83, and possibly also in 1985. A more detailed breakdown of the periods for the correlations suggests that M3 had a very strong leading relationship with demand between 1970 and 1977 (a significant correlation coefficient of 0.44). Between 1977 and 1983, this relationship disappeared, with no concurrent or leading coefficients being significant. After 1983, a strong concurrent relationship (evident in Table 3) is found. These results are consistent with views put forward elsewhere that the relationship between M3 and activity has at times been unstable over the past 20 years..<sup>3</sup>

Broad money shows a strong coincident relationship with real demand through both of the sub-periods. There is no evidence of broad money playing a leading role. There is also no evidence of coincident relationships for the broader lending aggregates in the sub-period analysis. Several leading coefficients are significant in these cases, but with unexpected signs (negative). This strengthens in the 1983-1987 period. One explanation for this apparently paradoxical result could lie in the number of turning points in the 1980s. If these aggregates in fact lag activity (as the evidence in Table 2 suggests), then negative correlations between leads of the aggregates and current demand might be expected where there are pronounced cycles in demand. In effect, these coefficients are picking up the fact that just after a turning point, demand is negatively correlated with lags of itself.

In summary, the evidence to this point suggests that nominal interest rates and M1 have had a consistent, leading relationship with real private demand over the past 20 years. Other bank-based aggregates have been less consistent as indicators. Broader aggregates have had reasonably good relationships, but have tended to be lagging or coincident indicators.



Table 3: Correlation Coefficients Between Financial Indicators  
and Real Private Demand: Selected Sub-Periods

Indicator	Lead in Quarters	Sub-periods(a)		
		Mar. 1968 to Dec. 1980	Dec. 1980 to Dec. 1987	Dec 1983 to Dec. 1987
Bill rate	0	-.37**	-.37**	-.76**
	1	-.36**	-.54**	-.76**
	2	-.33**	-.56**	-.61**
	3	-.10	-.60**	-.50**
	4	-.08	-.47**	-.35
	5	.00	-.29	-.27
M1	0	.30**	.30	.34
	1	.24*	.45**	.48*
	2	.12	.52**	.36
	3	.01	.24	-.11
	4	-.13	.31	.24
	5	-.15	.10	.13
M3	0	.24*	.37*	.62**
	1	.21	.08	.15
	2	-.05	.18	-.04
	3	-.17	-.10	-.22
	4	-.26*	-.14	-.30
	5	-.07	-.06	-.25
Bank lending	0	.09	.17	.02
	1	-.04	-.05	-.30
	2	-.18	-.09	-.56**
	3	-.26**	-.39**	-.80**
	4	-.41**	-.40**	-.70**
	5	-.26*	-.22	-.56**
Broad money	0	-	.40**	.48*
	1	-	.13	-.02
	2	-	.08	.10
	3	-	-.13	-.25
	4	-	-.36*	-.62**
	5	-	-.32*	-.48*

Table 3 (cont'd): Correlation Coefficients Between Financial Indicators  
and Real Private Demand: Selected Sub-Periods

Indicator	Sub-periods(a)			
	Lead in Quarters	Mar. 1968 to Dec. 1980	Dec. 1980 to Dec. 1987	Dec 1983 to Dec. 1987
Lending	0	-	.16	-.11
	1	-	.07	-.22
	2	-	-.11	-.30
	3	-	-.36*	-.56**
	4	-	-.43**	-.63**
	5	-	-.52**	-.69**
Credit	0	-	.17	-.19
	1	-	.13	-.11
	2	-	-.07	-.23
	3	-	-.31	-.51**
	4	-	-.38**	-.54**
	5	-	-.53**	-.72**

(a) An asterisk indicates significance at the 10 per cent level; two indicates the 5 per cent level.

## 5. Financial Indicators and Nominal Private Demand: Graphical Comparisons

It might be objected, with respect to Sections 3 and 4, that financial aggregates measured in nominal terms should not really be compared with real magnitudes for activity. Traditional notions of the demand for money, for example, typically explain the demand for real money balances in terms of real income and the opportunity cost of holding money. Alternatively, the real quantity of credit extended by intermediaries might be a determinant of real expenditure. Under this sort of framework, nominal financial variables should be compared with nominal measures of activity. This approach is taken in this and the following section.

Part (a) of this section looks at a nominal series for private demand and compares it with the real series used in Sections 3 and 4. Part (b) looks at the relationship between interest rates and nominal demand, while part (c) examines the banking aggregates. The final part compares nominal demand with the broader financial aggregates.

### (a) Growth in Nominal Demand

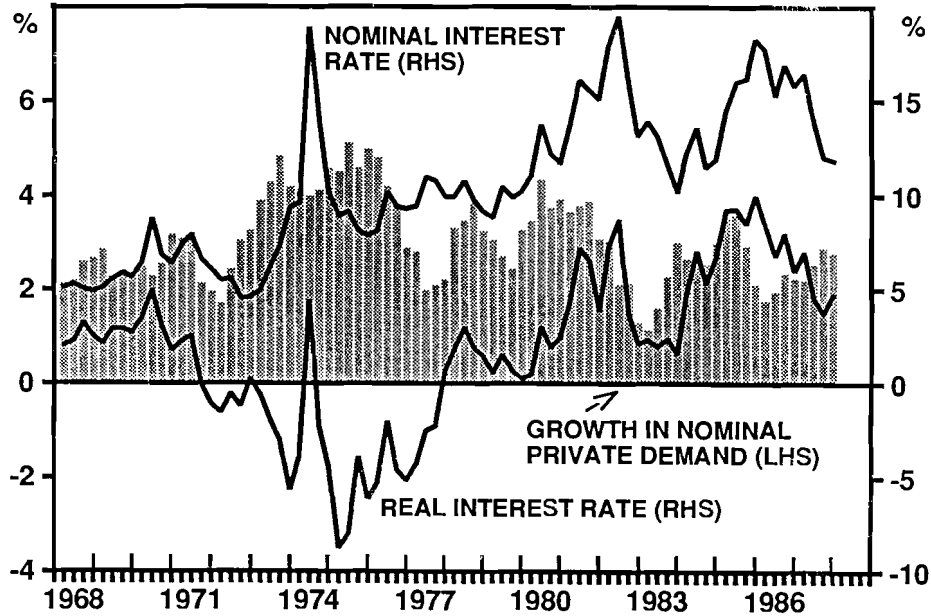
Figure 9 compares (smoothed) growth in nominal and real private demand over the period 1968 to 1987. Several features stand out.

Firstly, for much of the period under consideration, the rate of inflation is considerably less volatile than the rate of growth of real demand. As a result, the nominal and real series for demand exhibit similar patterns. The major exception was during 1974 when real private demand fell quite sharply. With inflation rising, growth in nominal private demand fell only slightly, after the fall in real growth, and recovered before real growth became positive again.

In each of the four "recessions" identified using growth in real private demand, growth in nominal demand also fell, on three occasions quite noticeably, though nominal demand never actually fell in absolute terms.

Most turning points of nominal demand were coincident with or lagged those of real demand. The exception was during the mid 1970s when nominal demand turned prior to real demand in two instances.

**FIGURE 10: INTEREST RATES AND NOMINAL PRIVATE DEMAND**



(b) Interest Rates

Figure 10 shows the bill rate, in both nominal and real terms,<sup>14</sup> and growth in nominal private demand. In the second half of the period, the relationship between the nominal bill rate and nominal demand was similar to that found for real demand: rises in interest rates preceded falls in the growth of demand, and falls in interest rates preceded pick-ups in demand.

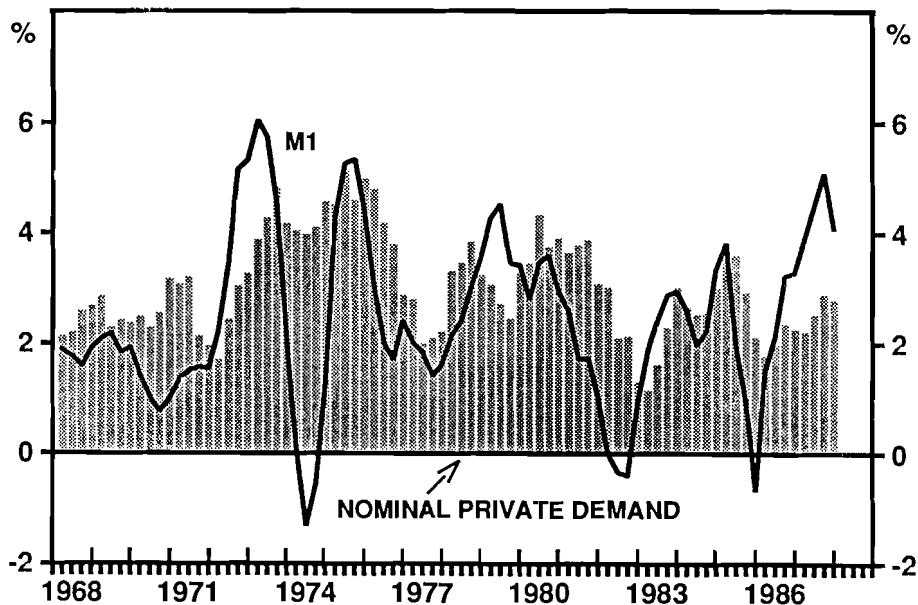
The relationship is more complex in the first half of the graph. It is clear that nominal interest rates did not perform well as an indicator of nominal demand in this period. Up to 1971, the general upward trend in growth of nominal demand was matched by a rise in nominal interest rates. The major acceleration in demand in 1972-73 was preceded by a slight fall in interest rates, but was followed by a

14. The real bill rate is defined in footnote 5.

very large rise in nominal interest rates. The subsequent slowing in nominal demand was much more subdued, relative to the size of the rise in nominal interest rates, than the slowing in real demand. At about the same time as nominal interest rates came down very quickly in the second half of 1974, growth in nominal demand rose again, to annual rates of around 20 per cent in 1975.

During this period, movements in real interest rates were sometimes quite different to those in nominal rates. Real rates fell noticeably from about the end of 1970 as inflation gathered pace. Even though nominal rates were rising, there was no rise in real rates until the middle of 1974 and that was only temporary. In fact, a very strong visual impression is that the bulge in nominal demand growth at this time broadly corresponded to negative real interest rates.

**FIGURE 11: GROWTH IN M1 AND  
NOMINAL PRIVATE DEMAND**



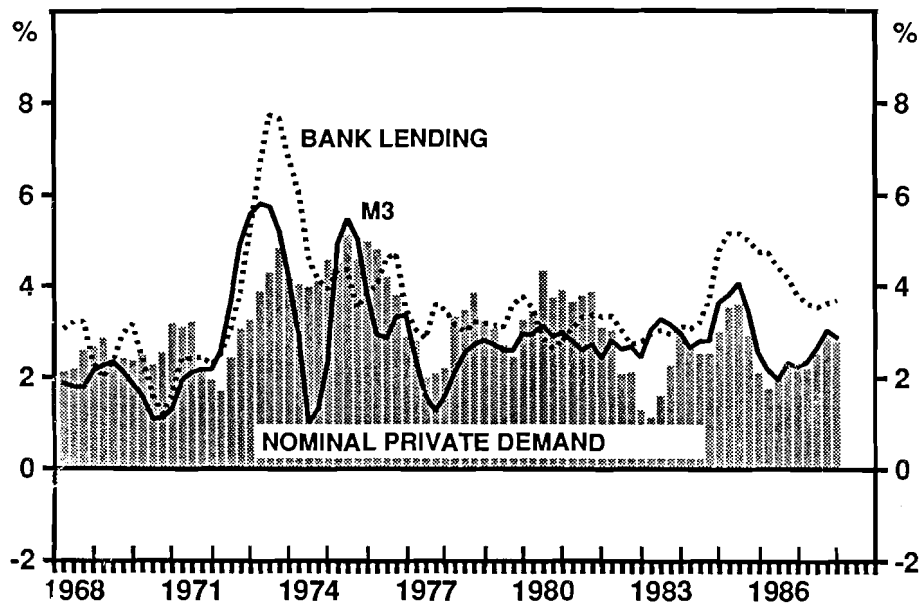
Of course, it is difficult to be definitive about what borrowers and lenders perceived real interest rates to be at the time. One result which is clear, however, is that for this period, the dynamics of the

interaction of interest rates, real activity and inflation were complex, too much so to be described easily on a graph.

(c) Banking Aggregates

Figure 11 shows growth in M1 and nominal demand. Broadly speaking, they appear to be positively related - expansions in M1 were associated with increased growth in nominal demand and falling growth in M1 was associated with downturns in growth of nominal demand. In most cases, growth of M1 tended to lead growth in nominal demand, except in the late 1970s.

**FIGURE 12: GROWTH IN M3, BANK LENDING AND NOMINAL PRIVATE DEMAND**

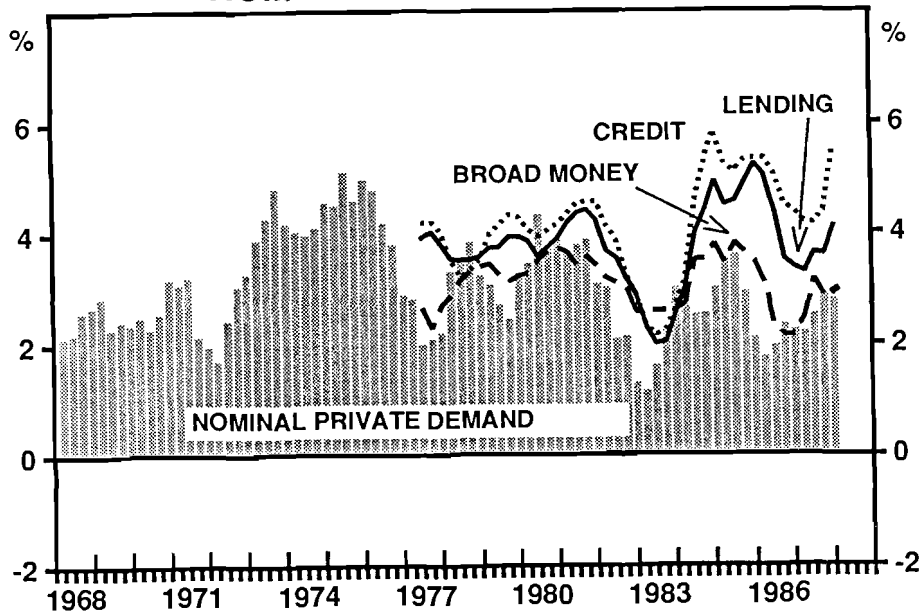


Again, there is some evidence of a breakdown in what was otherwise a pretty good relationship in the very recent period. In 1987, growth

in M1 was at its strongest since the mid 1970s, but growth in nominal demand much lower.<sup>15</sup>

Figure 12 shows growth in nominal private demand, M3 and bank lending. For much of the period, the actual rate of growth of both aggregates was little different from that of demand. During the 1970s, growth in M3 also had a good cyclical relationship with growth in nominal demand. Growth in M3 appeared to lead growth in nominal demand on some occasions. The relationship was not always uniform, however. The sharp fall in growth of M3 in 1974 was only associated with a slight downturn in growth of nominal demand, and demand subsequently picked up only slightly when M3 growth increased rapidly. In the following episode, by contrast, M3 and demand growth were much more closely related.

**FIGURE 13: GROWTH IN  
BROADER AGGREGATES AND  
NOMINAL PRIVATE DEMAND**



15. This is another case where the use of the GDP cycle provides slightly different conclusions, as nominal GDP growth has been substantially stronger, in the recent upturn, than growth in nominal demand. It should be noted, however, that although the exchange rate has not been considered in this paper, it would have an important influence since 1984.

As was the case for real demand, there was not much of a relationship between M3 and nominal demand from 1976 to 1983. M3 showed no indication of the downturn in nominal demand in 1982/83. A fairly close relationship between M3 and nominal demand was re-established in the most recent cycle, but it was coincident rather than leading.

Bank lending, like M3, had a strong cyclical relationship to nominal demand in the 1973-74 period, but its performance seems to have worsened after that. A stronger relationship was re-established from about 1985, although the most recent upturn in nominal demand appeared to lead the upturn in bank lending by around four quarters. Further, a shift in the relationship is apparent: the trough in the growth of bank lending was much higher than the average growth of bank lending at any time since the mid 1970s, despite a sizeable fall in nominal demand growth in 1985.

#### (d) Broader Aggregates

Figure 13 shows growth in nominal demand and growth in the broader financial aggregates - broad money, lending and credit. All three aggregates have a strong positive relationship with growth in nominal demand, although they appear to lag it.

Broad money had a good association with both major downturns in nominal demand. It also had a clear positive relationship with the smaller downturn in 1979. In most cases, turning points in broad money tended to lag those in nominal demand. There were a few cases which were arguably coincident. Credit and lending also exhibited a positive relationship with nominal demand, although they appeared to lag nominal demand by more than broad money.

While all three aggregates grew at rates a little above that of nominal demand in the late 1970s and early 1980s, lending and credit have grown at rates considerably higher than demand since 1985. This suggests some structural change in the relationship between activity and lending and credit.



## 6. Financial Indicators and Nominal Private Demand: Correlation Analysis

This section presents correlation coefficients between financial indicators and nominal private demand. It follows the same format as Section 4: part (a) shows results for the full 1968-87 period, while part (b) separates the data into sub-periods.

### (a) Full sample results

Table 4 presents correlation coefficients between the range of financial variables and nominal private demand. Results out to a lead of six quarters are reported. This is one quarter more than for real demand because significant coefficients were found at longer leads.

Table 4: Correlation Coefficients Between  
Financial Variables and Nominal Private Demand

Variable	Lead in Quarters (b)						
	0	1	2	3	4	5	6
Bill rate	-.02	-.10	-.18	-.23**	-.26**	-.28**	-.30**
M1	.02	.19*	.34**	.39**	.39**	.32**	.26**
M3	.22*	.39**	.43**	.40**	.34**	.29**	.22**
Bank Lending	.34**	.41**	.41**	.40**	.33**	.30**	.29**
Broad Money (a)	.55**	.33**	.29*	.15	.09	.09	-.01
Lending (a)	.46**	.22	.12	.06	.08	.03	.03
Credit (a)	.34**	.16	.07	.04	.07	.02	-.06

(a) The estimation period for these variables is from 1976-87. The others are for the full sample, 1968-87. All financial aggregates and demand are quarterly percentage changes.

(b) An asterisk indicates significance at the 10 per cent level; two indicates the 5 per cent level.

For interest rates, all significant coefficients are negative, as expected. In other words, a rise in the short-term interest rate is generally associated with a fall in nominal demand, a result consistent with those found using real demand. The important difference is that there is no coincident relationship, and no relationship at leads 1 and 2, and that the coefficients at leads 5 and 6 are now significant. That is,

2, and that the coefficients at leads 5 and 6 are now significant. That is, the lead length is extended by 2-3 quarters compared with the results for real demand.

The picture is similar for M1. There are strong positive correlations with nominal demand, beginning at the second lead, and continuing to the sixth lead.

For M3 and bank lending, the results are much stronger than they are for real demand. They also show larger coefficients on M3 as compared with interest rates and M1. There are large and significant positive coefficients running from zero to six quarter leads for both M3 and bank lending.

Broad money has a significant positive correlation with nominal demand, which is the strongest in the current quarter and extends to lead 2. This significant leading role for broad money contrasts with its relationship to real demand, where the only significant positive correlation was the coincident one.

Lending and credit have very similar correlation patterns. The current coefficients are both positive and significant, (unlike the results using real demand) but no leading coefficients are significant. Table 5 shows correlations between the financial indicators and nominal demand when the financial indicators are allowed to lag demand. It suggests that the broader lending and credit aggregates do lag nominal demand.

In comparing the correlation results above to those for real demand, it appears that the lead time is longer for those variables which lead demand and that the lag time is shorter for those which lag demand.

Table 5: Correlation Coefficients Between Financial Indicators and Nominal Private Demand

Indicator	lag in quarters(b)				
	1	2	3	4	5
Bill rate	.05	.10	.11	.10	.06
M1	-.13	-.23**	-.23**	-.21*	-.16
M3	.09	-.03	-.11	-.09	-.08
Bank lending	.24**	.15	.03	-.04	-.13
Broad Money (a)	.44**	.17	-.02	-.18	-.30**
Lending (a)	.51**	.40**	.19	-.05	-.26*
Credit (a)	.40**	.32**	.12	-.12	-.34**

(a) The estimation period for these variables is from 1976-87. The others are for the full sample, 1968-87. All financial aggregates and demand are quarterly percentage changes.

(b) An asterisk indicates significance at the 10 per cent level; two indicates the 5 per cent level.

#### (b) Variation Between Sub-Periods

Table 6 presents the sub-sample correlation coefficients for the financial indicators and nominal private demand. In the first sub-period, interest rates have a strong positive relationship with nominal demand, both coincidentally and over the six leading quarters. These results are in stark contrast to the full sample (and to the results for real demand). But they are consistent with the graphical evidence, which showed an apparent positive association of interest rates with nominal demand during the early 1970s. It is likely that the strength of this association, given the very large movements in both the series, dominates the correlation result.

This is confirmed by results for the 1980-87 period. In this latter period, only the coincident coefficient remains positive and significant, while the coefficients from leads 3 to 6 are negative. In the 1983-87 period, coefficients for leads 2 to 6 are negative and significant, and the coincident coefficient is insignificantly different from zero.

This latter relationship is sufficiently strong to dominate the correlation results for the full sample period<sup>16</sup>

The results for M1 also show noticeable changes in coefficients. The expected positive relationship between M1 and nominal demand is evident in the 1968-1980 sample for leads 1 to 4. The lag structure for the positive relationship lengthens in the 1980-87 period, and the coincident coefficient becomes negative. But in the 1983-87 period, the only significant relationship is a coincident, and negative one.<sup>17</sup>

For M3 and bank lending the strong, positive and leading relationship observed in the full sample is shown to be largely a reflection of the 1968-80 sub-period<sup>18</sup>. In the 1980-87 period, none of the coefficients were significant. The coincident and first two leading coefficients became significant in the 1983-87 period for M3, but for bank lending the only significant coefficients were of the wrong (negative) sign.

Broad money, lending and credit showed a leading relationship in the 1980-87 period, with the coincident and first two or three leading coefficients positive and significant in each case. But this was largely a result of the pre-December 1983 period, and the relationship deteriorated in the 1983-87 period. Each indicator lost a couple of significant leading coefficients, and credit did not have any significant positive coefficients at all. Each of the broad aggregates has a significant coefficient of the wrong (negative) sign at lead 6.

---

<sup>16</sup> The negative leading relationship between interest rates and nominal GDP in the post-1983 period is not as strong.

<sup>17</sup> Here again the results are sensitive to the choice of indicator for activity. The use of nominal GDP provides a significant positive relationship at the first quarter lead for M1.

<sup>18</sup> More detailed analysis (not reported here) suggests that the long leading relationship in the full sample is largely determined by the data in the late 1960's and early 1970's.

Table 6: Correlation Coefficients Between Financial Indicators  
and Nominal Private Demand: Selected Sub-Periods

Indicator	Lead in Quarters	Sub-periods(a)		
		Mar 1968 to Dec. 1980	Dec. 1980 to Dec. 1987	Dec. 1983 to Dec. 1987
Bill rate	0	.39**	.41**	.12
	1	.36**	.06	-.16
	2	.31**	-.28	-.51**
	3	.32**	-.53**	-.71**
	4	.32**	-.69**	-.70**
	5	.33**	-.75**	-.63**
	6	.31**	-.70**	-.54**
M1	0	.14	-.37*	-.49*
	1	.24*	-.01	-.08
	2	.30**	.37**	.38
	3	.33**	.45**	.37
	4	.29**	.55**	.25
	5	.24	.46**	.12
	6	.19	.34*	-.01
M3	0	.30**	.00	.36
	1	.47**	.18	.74**
	2	.50**	.32*	.71**
	3	.49**	.19	.33
	4	.45**	.08	-.00
	5	.38**	.09	-.20
	6	.34**	-.12	-.38
Bank Lending	0	.43**	.17	.37
	1	.54**	.14	.36
	2	.55**	.08	.24
	3	.57**	-.11	-.12
	4	.52**	-.25	-.49*
	5	.49**	-.26	-.62**
	6	.49**	-.31	-.72**

Table 6 (cont'd): Correlation Coefficients Between Financial Indicators  
and Nominal Private Demand: Selected Sub-Periods

Indicator	Lead in Quarters	Sub-periods(a)		
		Mar 1968 to Dec. 1980	Dec. 1980 to Dec. 1987	Dec. 1983 to Dec. 1987
Broad Money	0	-	.52**	.64**
	1	-	.52**	.48*
	2	-	.51**	.38
	3	-	.33*	.25
	4	-	.23	.08
	5	-	.09	-.11
	6	-	-.20	-.48*
Lending	0	-	.59**	.49*
	1	-	.52**	.23
	2	-	.35**	.05
	3	-	.13	-.08
	4	-	.03	-.15
	5	-	-.13	-.33
	6	-	-.26	-.54**
Credit	0	-	.48**	.25
	1	-	.45**	.15
	2	-	.34*	.08
	3	-	.18	.03
	4	-	.06	-.04
	5	-	-.16	-.29
	6	-	-.30	-.59**

(a) An asterisk indicates significance at the 10 per cent level; two indicates the 5 per cent level.

## 7. Conclusions

The evidence in this paper suggests that big changes in financial conditions are associated with big changes in private demand. This conclusion holds whether demand is measured in nominal or real terms.

The most useful financial indicators, in the sense of having a consistent, leading relationship to real private demand, are short-term interest rates and M1 (though these do not seem to be completely independent). The process of deregulation does not appear to have weakened the relationship between interest rates and real demand; if anything, that relationship has strengthened over recent years. For M1, however, there may have been some shift in the relationship recently.

The other banking aggregates were useful as leading indicators of real demand in the mid 1970s, but have been less useful since; they were particularly poor indicators in the early 1980s. Broader aggregates have a good relationship with real private demand, but their usefulness is confined to confirming what the indicators from the real economy have already suggested. There is also evidence of a shift in the relationship of broad lending and credit aggregates to real demand in recent years.

Nominal interest rates have been less useful as an indicator of growth in nominal private demand during periods of high and variable inflation, such as in the early and mid 1970s. (Since 1983, the relationship of nominal interest rates to nominal demand has improved noticeably.) The banking aggregates generally performed much better than nominal interest rates as indicators of nominal demand in such periods. This suggests care in the use of interest rates as indicators. When inflation is changing noticeably, some measure of the real cost of borrowing (even though necessarily crude) will be an important additional indicator.

It is also possible that the usefulness of the banking aggregates, relative to interest rates, as indicators of nominal demand in these earlier periods may have been a function of the regulatory environment. This question has not been addressed in this paper; it will be taken up in a later paper in this series. But there is evidence that these aggregates have failed as indicators at crucial times in the 1980s.

Broader aggregates are also closely related to nominal demand; there is less of a lag here (and in some cases, a leading relationship) than in the relationship to real demand. There is, however, evidence of a shift in the relationship since deregulation. The broad lending and credit aggregates have been growing much faster than nominal demand in recent years, and there is now no evidence that they lead nominal demand.

In comparing the results obtained from the real and nominal activity indicators, there is also an implication that movements in real demand tend to precede movements in inflation. This would help to explain, for example, the lengthening of the leading relationships (between many of the financial variables and demand) when the nominal demand results are compared with the real demand results.

While the paper has not sought to discuss relationships in terms of causality, the data, particularly for the deregulated period, do suggest a certain temporal ordering. Since deregulation, that ordering can be characterised as follows: interest rates move first, followed by M1. Real private demand moves immediately and for the next year. Nominal demand moves a little later. Other financial aggregates tend to move with, or a little later than, real private demand and coincidentally with nominal demand.

Any description of the monetary "transmission mechanism" must be consistent with that ordering. This is a topic for a future paper.



## Appendix

All data used in the paper are reproduced at the rear. The following sections detail sources of the data and, where appropriate, methods used to adjust the data.

### 1. Activity Variables

The activity variables used in the paper are from the December 1987 issue of the Quarterly Estimates of National Income and Expenditure, ABS Cat. No. 5206.0. Private demand is the sum of private consumption, dwelling investment (including real estate transfer expenses) and business fixed investment. Data for nominal demand are seasonally adjusted, at current prices; those for real demand are seasonally adjusted, in constant 1979/80 prices. Constant price data for periods prior to the March quarter 1969 are spliced from the 1974/75 based series.

#### Smoothing

The smoothed series for activity variables are, in all cases, three-quarter moving averages, centred on the reference quarter. For example, the smoothed figure for demand as at June 1987 is an average of the observations for the March, June and September quarters. Quarterly percentage changes in this smoothed series are shown on the graphs.

The intention of this process is to enable trends to be seen more easily on the graphs by smoothing out large fluctuations from quarter to quarter. At the same time, it is desirable to avoid giving a misleading impression as to the timing of turning points, hence, the moving average is centred, and has a small number of terms. For the correlation coefficients, unsmoothed (but still seasonally adjusted) data are used.

### 2. Financial Variables

#### (a) Interest Rates

Data for the yield on 90-day bank-accepted bills are from the Reserve Bank Bulletin; historical series are available on the Bulletin Database. The monthly data are averaged for each quarter, to form a better representation of the average interest rate prevailing in the quarter. Data for real interest

rates are calculated by deducting the year-ended change in the Consumer Price Index from the nominal bill rate.

Data on the cash rate and the rate on certificates of deposit are also obtained from the Reserve Bank Bulletin and Database. As for the 90-day bill rate, quarterly data are the average of monthly figures.

(b) Financial Aggregates

For the monetary and credit aggregates, all data are from the Reserve Bank Bulletin. Data for M1 and M3 are seasonally adjusted, as calculated by the Australian Bureau of Statistics. Data for broad money, bank lending, lending by all financial intermediaries and credit have been seasonally adjusted by the authors, using the multiplicative X-11Q procedure. In each case, a standard F-test could reject the null hypothesis of no stable seasonality.

The quarterly figures are the average of the (seasonally adjusted) monthly figures. Quarterly growth rates for M3 and bank lending are adjusted for the entry of new banks. Those banks whose statistics were not available for each of the six monthly figures needed to calculate the percentage change between quarters were excluded for the purposes of the calculation.

For growth in M1, the smoothed series is calculated in the same way as smoothed growth in private demand is calculated. The smoothed series for the other aggregates are three-term centred moving averages of the quarterly growth rates. (The averages of the growth rates are used because breaks in the levels series complicate calculations based on averaging the levels first.)

### 3. Correlation coefficients

The sample correlation coefficients reported in the text have been calculated using the CORR procedure in version 5 of SAS.<sup>1</sup> The sample correlation estimates the true correlation between two variables,  $x$  and  $y$ , and is calculated as:

$$r_{xy} = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{(\sum(x - \bar{x})^2) \sum(y - \bar{y})^2}}$$

---

<sup>1</sup> The source of the following is **SAS Users Guide: Basics**, Version 5 Edition (1985) Cary NC: SAS Institute Inc.

where  $\bar{x}$  and  $\bar{y}$  are the sample means of  $x$  and  $y$ .

The significance probability of the sample correlation coefficient is calculated by treating

$$(n - 2)^{1/2} r / (1 - r^2)^{1/2}$$

as coming from a  $t$  distribution with  $n-2$  degrees of freedom, where  $n$  is the sample size.

The correlation coefficients in the paper are calculated using seasonally adjusted data for financial aggregates. Where these have been seasonally adjusted by the authors, the correlations based on the original data (but still adjusted for new banks) are shown in Tables A.1 and A.2.

Table A.1: Correlation Coefficients Between  
Financial Indicators and Private Demand (Original Data)

Variable	lead in quarters(b)					
	0	1	2	3	4	5
Bank lending (a)	.09	-.07	-.09	-.19	-.24	-.24
Broad money	.06	-.04	.25*	-.04	-.01	.03
Lending	.07	-.19	-.12	.04	-.02	-.01
Credit	.11	.11	.05	.11	.11	-.05

(a) Correlations over 1968-87. The correlations for other variables are over the period 1976-1987.

(b) An asterisk indicates significance at the 10 per cent level; two indicates the 5 per cent level.

Table A.2: Correlation Coefficients Between Financial Indicators and Private Demand in Selected Sub-Periods (Original Data)

<u>Indicators</u>	<u>Sub-periods(a)</u>			
	<u>Lead in quarters</u>	<u>Mar 1968 to Dec 1980</u>	<u>Dec 1980 to Dec 1987</u>	<u>Dec 1983 to Dec 1987</u>
Bank Lending	0	.00	.21	.08
	1	.01	-.06	-.21
	2	-.19	-.11	-.61**
	3	-.12	-.39**	-.72**
	4	-.35**	-.25	-.57**
	5	-.19	-.19	-.44*
Broad Money	0	-	.13	.36
	1	-	-.16	-.11
	2	-	.12	.06
	3	-	-.16	-.12
	4	-	-.02	-.40
	5	-	-.24	-.38
Lending	0	-	.17	.08
	1	-	.02	-.24
	2	-	-.16	-.50**
	3	-	-.32*	-.48*
	4	-	-.25	-.37
	5	-	-.48*	-.61**
Credit	0	-	.22	-.02
	1	-	.06	-.23
	2	-	-.11	-.38
	3	-	-.26	-.33
	4	-	-.23	-.35
	5	-	-.48**	-.69**

(a) An asterisk indicates significance at the 10 per cent level; two indicates the 5 per cent level.

## References

- Beck, M.T., M.G. Bush and R.W. Hayes (1973) "The Indicator Approach to the Identification of Business Cycles", Reserve Bank of Australia **Occasional Paper** No. 2, June 1973.
- Blundell-Wignall, A. and S. Thorp (1987) "Money Demand, Own Interest Rates and Deregulation", Reserve Bank of Australia Research Discussion Paper No. 8703, May 1987.
- Boehm, E.A. (1987) "New Economic Indicators for Australia: A Further Report", IAESR Working Paper No. 4, April 1987.
- Boehm, E.A. and L.V. Defris (1977) "Recurring Periods of Plateau Slumps and Sluggish Recoveries in the Australian Economy: 1950 to 1976", *Australian Economic Review* 1st Quarter 1977, pp 53-60.
- Bullock, M., G. Stevens and S. Thorp (1988) "Do Financial Aggregates Lead Activity? A Preliminary Analysis", Reserve Bank of Australia Research Discussion Paper No. 8803, January 1988.
- Davis, K. and M. Lewis (1978) "Money and Income: Evidence from Simple Models". in *The Australian Monetary System in the 1970s*, M.G. Porter (ed), Monash University: Melbourne.
- Edey, M.L., E.J. Kerrison and G.D. Menzies (1987) "Transmission of External Shocks in the RBII Model", Reserve Bank of Australia Research Discussion Paper No. 8710, November 1987.
- Fahrer, J.G., R.W. Rankin and J.C. Taylor (1984) "The Equations of the RBA82 Model of the Australian Economy", Reserve Bank of Australia Research Discussion Paper No. 8401, August 1984.
- Goodhart, C.A.E. (1975) "Problems of Monetary Management: The U.K. Experience", *Papers in Monetary Economics*, Reserve Bank of Australia, Sydney.
- Sharpe, I.G. (1975) "The Money Supply, Financing Government and Economic Activity", *Economic Papers* No. 50, December 1975, pp 23-43.
- Stevens, G., S. Thorp and J. Anderson (1987) "The Australian Demand Function for Money: Another Look at Stability", Reserve Bank of Australia Research Discussion Paper No. 8701, January 1987.

Date	1		2		3		4	
	Private Final		Private Final		Gross Domestic		Gross Domestic	
	Demand, SA		Demand, SA		Product, SA		Product, SA	
	1979/80 prices \$ million		current prices \$ million		1979/80 prices \$ million		current prices \$ million	
	Dec 87	Nat. Acc.	Dec 87	Nat. Acc.	Dec 87	Nat. Acc.	Dec 87	Nat. Acc.
Mar 1968	14981		5088		20480		6467	
Jun 1968	15043		5190		20865		6624	
Sep 1968	15289		5321		21048		6854	
Dec 1968	15718		5494		21234		7139	
Mar 1969	15848		5619		21316		7290	
Jun 1969	16213		5792		21584		7488	
Sep 1969	16367		5880		21388		7644	
Dec 1969	16610		6038		21513		7852	
Mar 1970	16839		6213		21660		8037	
Jun 1970	16995		6333		22429		8273	
Sep 1970	17169		6463		22471		8386	
Dec 1970	17436		6698		22803		8593	
Mar 1971	17736		6954		23127		8968	
Jun 1971	17786		7085		23413		9160	
Sep 1971	18245		7363		24070		9551	
Dec 1971	18013		7412		24047		9657	
Mar 1972	18016		7514		23953		9872	
Jun 1972	18260		7743		24711		10291	
Sep 1972	18464		7966		24461		10508	
Dec 1972	18848		8224		25182		10995	
Mar 1973	19271		8526		25810		11564	
Jun 1973	19613		8926		25650		11948	
Sep 1973	19712		9325		26159		12765	
Dec 1973	20150		9818		26467		13236	
Mar 1974	20222		10101		26398		13746	
Jun 1974	19986		10509		26036		13953	
Sep 1974	19828		11029		26308		15266	
Dec 1974	19593		11401		26785		16033	
Mar 1975	20014		12015		26767		16447	
Jun 1975	20180		12583		27410		17285	
Sep 1975	20530		13245		27118		17887	
Dec 1975	20346		13750		27022		18726	
Mar 1976	20907		14553		27721		19585	
Jun 1976	21237		15239		28071		20481	
Sep 1976	21238		15579		28195		21198	
Dec 1976	21615		16279		28256		21575	
Mar 1977	21443		16601		28136		22159	
Jun 1977	21328		16939		28436		22701	
Sep 1977	21296		17274		28376		23088	
Dec 1977	21297		17665		28178		23275	
Mar 1978	21477		18089		28563		24096	
Jun 1978	22185		19036		28895		24688	
Sep 1978	22368		19565		29669		25790	
Dec 1978	22507		20271		29897		26574	
Mar 1979	22791		20948		30374		27676	
Jun 1979	22831		21425		30014		27955	
Sep 1979	22830		21972		30038		29018	
Dec 1979	22882		22525		30596		29858	
Mar 1980	23222		23583		30437		31155	
Jun 1980	23431		24325		30773		31917	

Date	1		2		3		4	
	Private Final		Private Final		Gross Domestic		Gross Domestic	
	Demand, SA		Demand, SA		Product, SA		Product, SA	
	1979/80 prices		current prices		1979/80 prices		current prices	
	\$ million		\$ million		\$ million		\$ million	
	Dec 87	Nat. Acc.	Dec 87	Nat. Acc.	Dec 87	Nat. Acc.	Dec 87	Nat. Acc.
Sep 1980	24074		25575		30835		32925	
Dec 1980	24234		26335		31456		34409	
Mar 1981	24495		27310		31444		35205	
Jun 1981	25010		28468		31917		36333	
Sep 1981	25344		29444		31995		37506	
Dec 1981	25702		30613		31914		38385	
Mar 1982	25607		31201		31970		39236	
Jun 1982	25774		32209		31996		40553	
Sep 1982	25264		32584		31943		41564	
Dec 1982	25201		33249		31639		42278	
Mar 1983	24932		33486		31619		42815	
Jun 1983	24592		33718		31238		43079	
Sep 1983	25121		34864		32327		45117	
Dec 1983	25279		35822		32556		46412	
Mar 1984	25692		36872		33579		48790	
Jun 1984	25943		37735		33971		50178	
Sep 1984	26226		38619		34098		50792	
Dec 1984	26675		39750		34655		52142	
Mar 1985	27222		41228		34973		53439	
Jun 1985	27589		42862		35882		55746	
Sep 1985	27800		44211		36697		57925	
Dec 1985	27676		44992		36284		58304	
Mar 1986	27405		45650		36490		59784	
Jun 1986	27495		46597		36175		60332	
Sep 1986	27426		47688		36614		62066	
Dec 1986	27440		48936		37092		64233	
Mar 1987	27368		49819		37448		65815	
Jun 1987	27578		50926		38302		68764	
Sep 1987	28118		52731		38237		69965	
Dec 1987	28336		53900		38807		72471	

Date	5	6	7	8	9
	Nominal 90 Day Bill Rate per cent	Real 90 Day Bill Rate per cent	Not Seasonally Adjusted \$ million	M 1 Seasonally Adjusted \$ million	M 3 Not Seasonally Adjusted \$ million
Mar 1968	5.13	2.03	4511	4373	12809
Jun 1968	5.32	2.22	4427	4452	12754
Sep 1968	5.08	3.28	4385	4526	12977
Dec 1968	4.93	2.53	4620	4585	13443
Mar 1969	5.12	2.12	4858	4712	13852
Jun 1969	5.60	2.90	4789	4815	13930
Sep 1969	5.90	2.90	4747	4894	14159
Dec 1969	5.65	2.67	5020	4976	14705
Mar 1970	6.42	3.47	5244	5100	14987
Jun 1970	8.80	4.99	5076	5108	14896
Sep 1970	6.85	3.06	4994	5130	14927
Dec 1970	6.37	1.76	5257	5219	15449
Mar 1971	7.40	2.24	5401	5262	15787
Jun 1971	7.92	2.55	5317	5341	15829
Sep 1971	6.65	-0.09	5308	5457	16090
Dec 1971	6.07	-1.09	5555	5515	16774
Mar 1972	5.53	-1.55	5738	5592	17336
Jun 1972	5.62	-0.55	5793	5822	17464
Sep 1972	4.57	-1.22	5932	6100	18262
Dec 1972	4.62	0.25	6546	6496	19831
Mar 1973	4.98	-0.61	6981	6801	21107
Jun 1973	6.20	-1.88	7243	7272	21753
Sep 1973	7.38	-3.06	7459	7676	22916
Dec 1973	9.37	-5.66	7829	7783	24280
Mar 1974	9.62	-3.88	7957	7748	25284
Jun 1974	18.93	4.45	7668	7692	25140
Sep 1974	13.93	-2.28	7276	7479	24456
Dec 1974	10.15	-4.41	7668	7625	25967
Mar 1975	8.90	-8.72	8204	7980	27699
Jun 1975	9.17	-7.98	8394	8466	28414
Sep 1975	8.13	-3.88	8644	8889	29812
Dec 1975	7.90	-6.12	9382	9329	31723
Mar 1976	8.13	-5.22	9918	9644	32681
Jun 1976	10.18	-2.01	9723	9758	32688
Sep 1976	9.43	-4.58	9639	9906	33800
Dec 1976	9.30	-5.13	10183	10143	35671
Mar 1977	9.45	-4.24	10781	10478	37089
Jun 1977	10.98	-2.53	10476	10524	36433
Sep 1977	10.77	-2.28	10427	10711	36680
Dec 1977	9.95	0.64	10973	10922	38111
Mar 1978	9.95	1.83	11385	11048	39222
Jun 1978	10.77	2.97	11317	11405	39190
Sep 1978	9.78	1.86	11426	11729	40325
Dec 1978	9.17	1.43	12148	12086	42070
Mar 1979	8.85	0.56	13037	12663	43712
Jun 1979	10.43	1.55	13195	13291	43843
Sep 1979	9.90	0.70	13446	13803	44641
Dec 1979	10.22	0.24	14115	14042	46737
Mar 1980	11.00	0.47	15142	14697	48999
Jun 1980	13.73	3.01	14875	15000	48892



Date	5	6	7	8	9
	Nominal 90 Day Bill Rate per cent	Real 90 Day Bill Rate per cent	Not Seasonally Adjusted \$ million	M 1 Seasonally Adjusted \$ million	M 3 Not Seasonally Adjusted \$ million
Sep 1980	12.17	1.92	15169	15568	50460
Dec 1980	11.75	2.46	16440	16329	52826
Mar 1981	13.78	4.37	16856	16379	54558
Jun 1981	16.05	7.21	16638	16803	55042
Sep 1981	15.52	6.53	16780	17184	56290
Dec 1981	15.07	3.83	17357	17249	58557
Mar 1982	17.90	7.32	17834	17325	60245
Jun 1982	19.45	8.71	16996	17179	61379
Sep 1982	16.08	3.76	16675	17070	62652
Dec 1982	13.13	2.12	17243	17115	64661
Mar 1983	13.88	2.34	18055	17631	66915
Jun 1983	13.13	1.95	17793	18027	68608
Sep 1983	11.58	2.39	18032	18380	70719
Dec 1983	10.17	1.56	19407	19189	73177
Mar 1984	12.27	4.77	20100	19663	75833
Jun 1984	13.58	7.08	19619	19862	76453
Sep 1984	11.47	5.37	19986	20340	78981
Dec 1984	11.88	6.78	21238	21001	81914
Mar 1985	14.55	9.25	22225	21914	86139
Jun 1985	15.95	9.30	22469	22755	88705
Sep 1985	16.13	8.52	21939	22298	94288
Dec 1985	18.25	10.01	22931	22557	97000
Mar 1986	17.65	8.43	22624	22303	98580
Jun 1986	15.25	6.82	22969	23300	101313
Sep 1986	16.88	8.01	23648	24015	103785
Dec 1986	15.82	6.03	24985	24546	106153
Mar 1987	16.42	7.02	25926	25652	109477
Jun 1987	13.88	4.58	26552	26891	113704
Sep 1987	12.03	3.73	27602	27990	118169
Dec 1987	11.82	4.72	30256	29752	123198

Date	10	11	12	13	14
	M3	M3	M3	Bank Lending Not Seasonally Adjusted	Bank Lending Not Seasonally Adjusted
	Seasonally Adjusted \$ million	Seasonally Adjusted % Change	Seasonally % Change For New Banks	Adjusted \$ million	Adjusted % Change
Mar 1968	12656	1.8	1.8	5606	0.8
Jun 1968	12853	1.6	1.6	5936	5.9
Sep 1968	13115	2.0	2.0	6136	3.4
Dec 1968	13348	1.8	1.8	6250	1.9
Mar 1969	13697	2.6	2.6	6239	-0.2
Jun 1969	14030	2.4	2.4	6530	4.7
Sep 1969	14309	2.0	2.0	6725	3.0
Dec 1969	14592	2.0	2.0	6897	2.6
Mar 1970	14832	1.6	1.6	7036	2.0
Jun 1970	15001	1.1	1.1	7267	3.3
Sep 1970	15074	0.5	0.5	7253	-0.2
Dec 1970	15337	1.7	1.7	7374	1.7
Mar 1971	15607	1.8	1.8	7476	1.4
Jun 1971	15974	2.4	2.4	7841	4.9
Sep 1971	16326	2.2	2.2	7944	1.3
Dec 1971	16655	2.0	2.0	8124	2.3
Mar 1972	17049	2.4	2.4	8224	1.2
Jun 1972	17627	3.4	3.4	8625	4.9
Sep 1972	18539	5.2	5.2	8919	3.4
Dec 1972	19692	6.2	6.2	9303	4.3
Mar 1973	20739	5.3	5.3	9833	5.7
Jun 1973	21955	5.9	5.9	10884	10.7
Sep 1973	23276	6.0	6.0	11662	7.1
Dec 1973	24122	3.6	3.6	12391	6.3
Mar 1974	24820	2.9	2.9	12984	4.8
Jun 1974	25376	2.2	2.2	14021	8.0
Sep 1974	24831	-2.1	-2.1	14202	1.3
Dec 1974	25793	3.9	3.9	14822	4.4
Mar 1975	27196	5.4	5.4	15437	4.1
Jun 1975	28706	5.6	5.6	16231	5.1
Sep 1975	30266	5.4	5.4	16835	3.7
Dec 1975	31499	4.1	4.1	17355	3.1
Mar 1976	32113	2.0	2.0	17860	2.9
Jun 1976	33012	2.8	2.8	19030	6.6
Sep 1976	34277	3.8	3.8	19808	4.1
Dec 1976	35431	3.4	3.4	20812	5.1
Mar 1977	36461	2.9	2.9	20778	-0.2
Jun 1977	36798	0.9	0.9	21731	4.6
Sep 1977	37163	1.0	1.0	22510	3.6
Dec 1977	37858	1.9	1.9	23483	4.3
Mar 1978	38587	1.9	1.9	23792	1.3
Jun 1978	39590	2.6	2.6	24766	4.1
Sep 1978	40815	3.1	3.1	25466	2.8
Dec 1978	41816	2.5	2.5	26585	4.4
Mar 1979	43039	2.9	2.9	26951	1.4
Jun 1979	44237	2.8	2.8	28008	3.9
Sep 1979	45169	2.1	2.1	28872	3.1
Dec 1979	46502	3.0	3.0	30407	5.3
Mar 1980	48266	3.8	3.8	31039	2.1
Jun 1980	49288	2.1	2.1	32122	3.5

Date	10	11	12	13	14
	M3	M3	M3	Bank Lending	Bank Lending
	Seasonally	Seasonally	Seasonally	Not Seasonally	Not Seasonally
	Adjusted	Adjusted	% Change	Adjusted	Adjusted
	\$ million	% Change	For New Banks	\$ million	% Change
Sep 1980	51018	3.5	3.5	32841	2.2
Dec 1980	52589	3.1	3.1	33989	3.5
Mar 1981	53825	2.3	2.3	34665	2.0
Jun 1981	55437	3.0	3.0	36114	4.2
Sep 1981	56802	2.5	2.5	37209	3.0
Dec 1981	58355	2.7	2.7	38677	3.9
Mar 1982	59560	2.1	2.1	39553	2.3
Jun 1982	61742	3.7	3.7	41221	4.2
Sep 1982	63071	2.2	2.2	42071	2.1
Dec 1982	64461	2.2	2.2	43245	2.8
Mar 1983	66398	3.0	3.0	44453	2.8
Jun 1983	68998	3.9	3.9	46096	3.7
Sep 1983	71018	2.9	2.9	47095	2.2
Dec 1983	72896	2.6	2.6	48862	3.8
Mar 1984	75389	3.4	3.4	50187	2.7
Jun 1984	76856	1.9	1.9	51751	3.1
Sep 1984	79202	3.1	3.1	53532	3.4
Dec 1984	81948	3.5	3.5	56364	5.3
Mar 1985	85613	4.5	4.4	59123	4.9
Jun 1985	89096	4.1	3.6	62937	6.4
Sep 1985	94417	6.0	4.2	67073	6.6
Dec 1985	96936	2.7	2.5	71073	6.0
Mar 1986	98166	1.3	1.0	73780	3.8
Jun 1986	101686	3.6	3.0	78803	6.8
Sep 1986	103844	2.1	1.9	82027	4.1
Dec 1986	105992	2.1	2.1	85030	3.7
Mar 1987	109205	3.0	2.8	87784	3.2
Jun 1987	114189	4.6	2.2	94000	7.1
Sep 1987	118102	3.4	3.0	97333	3.5
Dec 1987	122910	4.1	3.9	101521	4.3

Date	15	16	17	18
	Bank Lending Not Seasonally Adjusted % Change Adjusted For New Banks	Bank Lending Seasonally Adjusted \$ million	Bank Lending Seasonally Adjusted % Change	Bank Lending Seasonally Adjusted % Change Adjusted For New Banks
Mar 1968	0.8	5678	2.2	2.2
Jun 1968	5.9	5894	3.8	3.8
Sep 1968	3.4	6109	3.6	3.6
Dec 1968	1.9	6245	2.2	2.2
Mar 1969	-0.2	6318	1.2	1.2
Jun 1969	4.7	6482	2.6	2.6
Sep 1969	3.0	6698	3.3	3.3
Dec 1969	2.6	6895	2.9	2.9
Mar 1970	2.0	7119	3.3	3.3
Jun 1970	3.3	7203	1.2	1.2
Sep 1970	-0.2	7233	0.4	0.4
Dec 1970	1.7	7379	2.0	2.0
Mar 1971	1.4	7562	2.5	2.5
Jun 1971	4.9	7768	2.7	2.7
Sep 1971	1.3	7925	2.0	2.0
Dec 1971	2.3	8133	2.6	2.6
Mar 1972	1.2	8313	2.2	2.2
Jun 1972	4.9	8540	2.7	2.7
Sep 1972	3.4	8903	4.3	4.3
Dec 1972	4.3	9316	4.6	4.6
Mar 1973	5.7	9937	6.7	6.7
Jun 1973	10.7	10777	8.5	8.5
Sep 1973	7.1	11647	8.1	8.1
Dec 1973	6.3	12398	6.5	6.5
Mar 1974	4.8	13119	5.8	5.8
Jun 1974	8.0	13898	5.9	5.9
Sep 1974	1.3	14187	2.1	2.1
Dec 1974	4.4	14807	4.4	4.4
Mar 1975	4.1	15595	5.3	5.3
Jun 1975	5.1	16114	3.3	3.3
Sep 1975	3.7	16825	4.4	4.4
Dec 1975	3.1	17300	2.8	2.8
Mar 1976	2.9	18037	4.3	4.3
Jun 1976	6.6	18932	5.0	5.0
Sep 1976	4.1	19807	4.6	4.6
Dec 1976	5.1	20702	4.5	4.5
Mar 1977	-0.2	20974	1.3	1.3
Jun 1977	4.6	21660	3.3	3.3
Sep 1977	3.6	22521	4.0	4.0
Dec 1977	4.3	23321	3.6	3.6
Mar 1978	1.3	24000	2.9	2.9
Jun 1978	4.1	24718	3.0	3.0
Sep 1978	2.8	25490	3.1	3.1
Dec 1978	4.4	26389	3.5	3.5
Mar 1979	1.4	27162	2.9	2.9
Jun 1979	3.9	27969	3.0	3.0
Sep 1979	3.1	28910	3.4	3.4
Dec 1979	5.3	30199	4.5	4.5
Mar 1980	2.1	31249	3.5	3.5
Jun 1980	3.5	32072	2.6	2.6

Date	1 5 Bank Lending Not Seasonally Adjusted % Change Adjusted For New Banks	1 6 Bank Lending Seasonally Adjusted \$ million	1 7 Bank Lending Seasonally Adjusted % Change	1 8 Bank Lending Seasonally Adjusted % Change Adjusted For New Banks
Sep 1980	2.2	32891	2.6	2.6
Dec 1980	3.5	33797	2.8	2.8
Mar 1981	2.0	34864	3.2	3.2
Jun 1981	4.2	36043	3.4	3.4
Sep 1981	3.0	37270	3.4	3.4
Dec 1981	3.9	38504	3.3	3.3
Mar 1982	2.3	39749	3.2	3.2
Jun 1982	4.2	41123	3.5	3.5
Sep 1982	2.1	42134	2.5	2.5
Dec 1982	2.8	43091	2.3	2.3
Mar 1983	2.8	44665	3.7	3.7
Jun 1983	3.7	45972	2.9	2.9
Sep 1983	2.2	47143	2.5	2.5
Dec 1983	3.8	48727	3.4	3.4
Mar 1984	2.7	50440	3.5	3.5
Jun 1984	3.1	51590	2.3	2.3
Sep 1984	3.4	53562	3.8	3.8
Dec 1984	5.3	56258	5.0	5.0
Mar 1985	4.8	59431	5.6	5.5
Jun 1985	5.9	62713	5.5	4.9
Sep 1985	4.7	67051	6.9	5.0
Dec 1985	5.2	70921	5.8	5.0
Mar 1986	3.3	74256	4.7	4.2
Jun 1986	6.1	78514	5.7	5.0
Sep 1986	3.7	81960	4.4	4.0
Dec 1986	3.7	84871	3.6	3.6
Mar 1987	3.0	88374	4.1	3.9
Jun 1987	4.5	93649	6.0	3.4
Sep 1987	3.0	97239	3.8	3.3
Dec 1987	4.2	101393	4.3	4.2

Date	1 9	2 0	2 1	2 2
	Broad Money (1) Not Seasonally Adjusted \$ million	Broad Money Not Seasonally Adjusted % change	Broad Money (2) Seasonally Adjusted \$ million	Broad Money Seasonally Adjusted % change
Mar 1968				
Jun 1968				
Sep 1968				
Dec 1968				
Mar 1969				
Jun 1969				
Sep 1969				
Dec 1969				
Mar 1970				
Jun 1970				
Sep 1970				
Dec 1970				
Mar 1971				
Jun 1971				
Sep 1971				
Dec 1971				
Mar 1972				
Jun 1972				
Sep 1972				
Dec 1972				
Mar 1973				
Jun 1973				
Sep 1973				
Dec 1973				
Mar 1974				
Jun 1974				
Sep 1974				
Dec 1974				
Mar 1975				
Jun 1975				
Sep 1975				
Dec 1975				
Mar 1976				
Jun 1976				
Sep 1976				
Dec 1976	51328		51068	
Mar 1977	53838	4.9	53059	3.9
Jun 1977	53386	-0.8	53910	1.6
Sep 1977	54663	2.4	55234	2.5
Dec 1977	57105	4.5	56791	2.8
Mar 1978	59195	3.7	58353	2.7
Jun 1978	59569	0.6	60158	3.1
Sep 1978	61697	3.6	62326	3.6
Dec 1978	64711	4.9	64337	3.2
Mar 1979	67446	4.2	66524	3.4
Jun 1979	68359	1.4	68991	3.7
Sep 1979	70104	2.6	70800	2.6
Dec 1979	73368	4.7	72959	3.0
Mar 1980	76872	4.8	75903	4.0
Jun 1980	77257	0.5	77972	2.7

Date	1 9	2 0	2 1	2 2
	Broad Money (1) Not Seasonally Adjusted \$ million	Broad Money Not Seasonally Adjusted % change	Broad Money (2) Seasonally Adjusted \$ million	Broad Money Seasonally Adjusted % change
Sep 1980	80148	3.7	80868	3.7
Dec 1980	85055	6.1	84571	4.6
Mar 1981	88005	3.5	86996	2.9
Jun 1981	89201	1.4	90023	3.5
Sep 1981	89464	4.0	93519	3.9
Dec 1981	97181	4.7	96638	3.3
Mar 1982	100582	3.5	99496	3.0
Jun 1982	101922	1.3	102737	3.3
Sep 1982	105083	3.1	105907	3.1
Dec 1982	109330	4.0	108784	2.7
Mar 1983	113066	2.5	111919	1.9
Jun 1983	115072	1.2	115945	3.0
Sep 1983	118381	2.9	119267	2.9
Dec 1983	122078	3.1	121494	1.9
Mar 1984	126462	3.6	125238	3.1
Jun 1984	128300	1.5	129284	3.2
Sep 1984	130483	4.2	131091	4.2
Dec 1984	136042	4.3	135205	3.1
Mar 1985	140801	3.5	140632	4.0
Jun 1985	144204	2.4	145120	3.2
Sep 1985	150658	4.5	151268	4.2
Dec 1985	157532	4.6	156556	3.5
Mar 1986	160923	2.2	160721	2.7
Jun 1986	164680	2.3	165742	3.1
Sep 1986	166778	1.3	167535	1.1
Dec 1986	172519	3.4	171299	2.2
Mar 1987	176784	2.5	176693	3.1
Jun 1987	179206	1.4	180303	2.0
Sep 1987	187237	4.5	188020	4.3
Dec 1987	193471	3.3	192232	2.2

(1) From March 1983 Broad Money includes cash management trusts. Broad Money excluding cash management trusts in March and June 1983 was 112,011 and 113,372 respectively. From September 1984 Broad Money excludes identifiable double counting. Including double counting, Broad Money was 133,747 in September 1984.

(2) From March 1983 Broad Money includes cash management trusts. Broad Money excluding cash management trusts in March and June 1983 was 110,877 and 114,231 respectively. From September 1984 Broad Money excludes identifiable double counting. Including double counting, Broad Money was 134,733 in September 1984.

Date	2 3	2 4	2 5	2 6
	AFI Lending (3) Not Seasonally Adjusted \$ million	AFI Lending Not Seasonally Adjusted % change	AFI Lending (4) Seasonally Adjusted \$ million	AFI Lending Seasonally Adjusted % change
Mar 1968				
Jun 1968				
Sep 1968				
Dec 1968				
Mar 1969				
Jun 1969				
Sep 1969				
Dec 1969				
Mar 1970				
Jun 1970				
Sep 1970				
Dec 1970				
Mar 1971				
Jun 1971				
Sep 1971				
Dec 1971				
Mar 1972				
Jun 1972				
Sep 1972				
Dec 1972				
Mar 1973				
Jun 1973				
Sep 1973				
Dec 1973				
Mar 1974				
Jun 1974				
Sep 1974				
Dec 1974				
Mar 1975				
Jun 1975				
Sep 1975				
Dec 1975				
Mar 1976				
Jun 1976				
Sep 1976				
Dec 1976	37296		37064	
Mar 1977	38117	2.2	38244	3.2
Jun 1977	39807	4.4	39858	4.2
Sep 1977	41517	4.3	41598	4.4
Dec 1977	43331	4.4	43054	3.5
Mar 1978	44442	2.6	44583	3.6
Jun 1978	46120	3.8	46180	3.6
Sep 1978	47672	3.4	47765	3.4
Dec 1978	49768	4.4	49466	3.6
Mar 1979	51170	2.8	51311	3.7
Jun 1979	53293	4.1	53328	3.9
Sep 1979	55139	3.5	55260	3.6
Dec 1979	57913	5.0	57616	4.3
Mar 1980	59736	3.1	59882	3.9
Jun 1980	61868	3.6	61909	3.4



Date	2 3	2 4	2 5	2 6
	AFI Lending (3) Not Seasonally Adjusted \$ million	AFI Lending Not Seasonally Adjusted % change	AFI Lending (4) Seasonally Adjusted \$ million	AFI Lending Seasonally Adjusted % change
Sep 1980	63886	3.3	64020	3.4
Dec 1980	67147	5.1	66839	4.4
Mar 1981	69256	3.1	69402	3.8
Jun 1981	72342	4.5	72388	4.3
Sep 1981	75827	4.8	75962	4.9
Dec 1981	79334	4.6	79015	4.0
Mar 1982	81818	3.1	81946	3.7
Jun 1982	84663	3.5	84616	3.3
Sep 1982	87486	3.3	87708	3.7
Dec 1982	90270	3.2	89985	2.6
Mar 1983	93013	1.9	93144	2.4
Jun 1983	95690	2.2	95604	2.0
Sep 1983	96952	1.3	97197	1.7
Dec 1983	99917	3.1	99637	2.5
Mar 1984	103035	3.1	103187	3.6
Jun 1984	106338	3.2	106263	3.0
Sep 1984	108507	5.1	108223	5.5
Dec 1984	113936	5.0	113420	4.8
Mar 1985	117607	3.2	118612	4.6
Jun 1985	123265	4.8	123511	4.1
Sep 1985	129959	5.4	129709	5.0
Dec 1985	137822	6.1	136965	5.6
Mar 1986	142557	3.4	143995	5.1
Jun 1986	150000	5.2	150327	4.4
Sep 1986	156182	4.1	155708	3.6
Dec 1986	160807	3.0	159720	2.6
Mar 1987	164287	2.2	166004	3.9
Jun 1987	171235	4.2	171546	3.3
Sep 1987	178314	4.1	177750	3.6
Dec 1987	185532	4.0	184646	3.9

(3) From March 1983 AFI Lending includes cash management trusts.

AFI Lending excluding cash management trusts in March and June 1983 was 92,012 and 94,030 respectively.

From September 1984 AFI Lending excludes identifiable double counting. Including double counting, AFI Lending was 111,771 in September 1984.

(4) From March 1983 AFI Lending includes cash management trusts.

AFI Lending excluding cash management trusts in March and June 1983 was 92,140 and 93,945 respectively.

From September 1984 AFI Lending excludes identifiable double counting. Including double counting, AFI Lending was 112,071 in September 1984.

Date	27	28	29	30
	Credit (5) Not Seasonally Adjusted \$ million	Credit Not Seasonally Adjusted % change	Credit (6) Seasonally Adjusted \$ million	Credit Seasonally Adjusted % change
Mar 1968				
Jun 1968				
Sep 1968				
Dec 1968				
Mar 1969				
Jun 1969				
Sep 1969				
Dec 1969				
Mar 1970				
Jun 1970				
Sep 1970				
Dec 1970				
Mar 1971				
Jun 1971				
Sep 1971				
Dec 1971				
Mar 1972				
Jun 1972				
Sep 1972				
Dec 1972				
Mar 1973				
Jun 1973				
Sep 1973				
Dec 1973				
Mar 1974				
Jun 1974				
Sep 1974				
Dec 1974				
Mar 1975				
Jun 1975				
Sep 1975				
Dec 1975				
Mar 1976				
Jun 1976				
Sep 1976				
Dec 1976	37217		37129	
Mar 1977	38235	2.7	38499	3.7
Jun 1977	40276	5.3	40112	4.2
Sep 1977	42007	4.3	42000	4.7
Dec 1977	43670	4.0	43564	3.7
Mar 1978	44843	2.7	45150	3.6
Jun 1978	46800	4.4	46605	3.2
Sep 1978	47908	2.4	47889	2.8
Dec 1978	49917	4.2	49822	4.0
Mar 1979	51369	2.9	51709	3.8
Jun 1979	54137	5.4	53864	4.2
Sep 1979	56319	4.0	56298	4.5
Dec 1979	58780	4.4	58741	4.3
Mar 1980	60701	3.3	61099	4.0
Jun 1980	63791	5.1	63453	3.9

Date	2 7	2 8	2 9	3 0
	Credit (5) Not Seasonally Adjusted \$ million	Credit Not Seasonally Adjusted % change	Credit (6) Seasonally Adjusted \$ million	Credit Seasonally Adjusted % change
Sep 1980	66007	3.5	65959	3.9
Dec 1980	68815	4.3	68829	4.4
Mar 1981	71250	3.5	71708	4.2
Jun 1981	75376	5.8	74954	4.5
Sep 1981	78699	4.4	78605	4.9
Dec 1981	81904	4.1	81988	4.3
Mar 1982	85185	4.0	85693	4.5
Jun 1982	89371	4.9	88747	3.6
Sep 1982	91957	2.9	91914	3.6
Dec 1982	94081	2.3	94273	2.6
Mar 1983	97042	2.1	97605	2.5
Jun 1983	100948	3.4	100195	2.0
Sep 1983	102249	1.3	102205	2.0
Dec 1983	104755	2.5	105011	2.7
Mar 1984	107766	2.9	108399	3.2
Jun 1984	113204	5.0	112376	3.7
Sep 1984	116881	6.1	116379	6.9
Dec 1984	123350	5.5	122594	5.3
Mar 1985	128128	3.9	129135	5.3
Jun 1985	135246	5.6	135690	5.1
Sep 1985	143000	5.7	142317	4.9
Dec 1985	151864	6.2	150849	6.0
Mar 1986	157327	3.6	158626	5.2
Jun 1986	165768	5.4	166336	4.9
Sep 1986	175754	6.0	174914	5.2
Dec 1986	182426	3.8	181204	3.6
Mar 1987	187683	2.9	189205	4.4
Jun 1987	197192	5.1	197792	4.5
Sep 1987	205563	4.2	204693	3.5
Dec 1987	216518	5.3	215185	5.1

(5) From March 1983 Credit includes cash management trusts.

Credit excluding cash management trusts in March and June 1983 was 96,041 and 99,288 respectively.

From September 1984 Credit excludes identifiable double counting. Including double counting, Credit was 120,145 in September 1984.

(6) From March 1983 Credit includes cash management trusts.

Credit excluding cash management trusts in March and June 1983 was 96,597 and 98,547 respectively.

From September 1984 Credit excludes identifiable double counting. Including double counting, Credit was 120,111 in September 1984.