

MONETARY POLICY COMING OUT OF RECESSION

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Since 1959 the U. S. has experienced six recessions, not counting the recession that began, according to the National Bureau of Economic Research, in March 2001. If the date the latest recession ended is taken to be 12/01, in line with Chairman Greenspan's testimony on March 7, 2002, that recovery is well under way, we can count a seventh recession since 1959. It is timely therefore to examine the part played by monetary policy in the past in the aftermath of recession as a guideline on what to expect in the current episode.

In this examination I use two indicators of Federal Reserve policy. One is the nominal federal funds rate, the instrument the Fed relies on to conduct monetary policy. The second is the nominal monetary base – the sum of currency and bank reserves at Federal Reserve banks – the quantity that changes in response to movements in the federal funds rate. The Fed does not attempt, however, to control the monetary base. In an appendix I also refer to real values of the two indicators, but here I limit the discussion to their nominal values, beginning with the fed funds rate.

1. The Nominal Fed Funds Rate Indicator of Monetary Policy

Table 1 lists the trough dates – the final date of each recession – since 1959. It shows the basis-point spread of the federal funds rate in each of the 24 months before the trough date and in each of the 24 months after the trough – the latter representing the recovery period. The spread measures the difference between the fed funds rate in each of the 24 months before the trough date and the fed funds rate at the trough. Similar spread results are shown for each of the 24 months after the trough date.

Inspection of the results in table 1 reveals that the spreads tended to be positive in the 24 months before the trough date, indicating that the fed funds rate was lower at the trough date. A central tendency in the 24 months after the trough date is less apparent. The spreads tend to be negative in the 24 months after the trough dates of November 1970, March 1975, and March 1991, indicating that during those recoveries the fed funds rate was lower.

At the foot of the table, average results are shown for the six recessions and an adjusted result that omits overlapping business-cycle phases, which complicates analysis of typical patterns. On average, the Fed began tightening some months after the trough date.

The spreads are exceptionally large because of the higher rate of inflation from the fourth to the twenty-fourth months after the trough of July 1990 and the 24 months before the trough and eight months after the trough of the recession ending in November 1982. The spreads in those months are multiples of those in comparable months of the other four recessions.

In short, the nominal fed funds rate typically exceeded the funds rate at the trough in the two years preceding it, and in three of the six recovery periods typically was lower in relation to the trough funds rate in every month following the trough. The Fed was tight in the two years preceding the trough, which means that it was tight during the recession until the trough date, and sometimes was accommodative during the two years following the trough date. This suggests that the Fed failed to recognize the cyclical peak, and continued policy that was inappropriate during recession. The size of the positive spreads, however, declined in the immediate 2-3 months before the end of the recessions, so that monetary policy was belatedly responsive to weak economic conditions. The Fed apparently waited until recession was under way and recognized before it eased. Similarly, in the past, after the trough date, the Fed delayed before initiating tighter policy.

2. The Nominal Monetary Base Indicator of Monetary Policy

Table 2 reports the behavior of the nominal monetary base during each of the 24 months preceding the trough date and during each of the 24 months following the trough date. The monetary base at each of the six trough dates since 1959 is indexed as 100. The base relative to the trough is less than 100 in the months before the trough date and greater than 100 in each of the months of the recovery. The base, though tighter than at the trough date, was typically growing during the months before that date and, though more expansive than at the trough date, kept growing during the recovery, matching tightness and ease during the corresponding periods exhibited by the federal funds rate.

Average results summarizing the base standings during all six periods surrounding the trough dates are shown as well as adjusted averages similar to the ones noted for table 1. One feature of the base results is that from the low point 24 months before the trough, the relative size of the base grows until the trough date. Consequently, from the cyclical peak until the trough date there was less pressure limiting base growth, unlike the federal funds rate, which revealed a slackening of contractionary Fed action only in 2-3 months before the trough date.

3. Timing of the Peak Fed Funds Rate in Relation to Cycle Dates

It is also possible to compare the Fed's performance in the months before each cycle peak and trough date. Table 3 shows the timing of the peak effective fed funds rate in relation to the cyclical trough date and the preceding cyclical peak date. The peak rate was, reached within months of the cyclical peak date in three cases, but in one case the cyclical peak date occurred over a year later, and in two cases months after the cyclical peaks in November 1973, and January 1980. These two were cyclical peaks the Fed was slow in recognizing. The funds rate

peaked many months before the trough date. I discuss the timing relations of the funds rate with the seventh cycle below.

4. The Seventh Recession Since 1959

What can be said about the performance of the indicators of monetary policy for the recession that began in March 2001 and ended, as we may tentatively decide, in December 2001? We can report their behavior in the 24 months before the trough date. The spread of the fed funds rate in every month from November 1999 through November 2000 was positive, indicating a higher funds rate than at the trough date, repeating the tightening pattern observed in the earlier pre-recession dates. The second 12-month pre-recession behavior of the fed funds rate for the seventh recession, however, departs from earlier experience during that time interval. As is well known, the Fed began a series of 11 reductions of the funds rate in January 2001. The spreads of the funds rate relative to the trough date funds rate not surprisingly declined in every month of the second year before the trough date, betokening increasing ease. A similar finding characterizes the monetary base. In the 12 pre-recession months of the year from November 1999 to November 2000, the base was lower than at the trough date, therefore revealing tight monetary policy. In the subsequent 12 months, the discrepancy of the monetary base relative to the trough date base was progressively narrowed, although less smoothly than the decline in the funds rate during the same period. This easing of monetary policy in the year preceding the trough, as I note in what follows, poses a problem for the Fed in how to proceed during recovery in 2002.

The fed funds rate peak in July 2000 occurred eight months before the cyclical peak in March 2001-- not unusually early in prefiguring it. Again, the peak funds rate in July 2000 was

17 months in advance of the December 2001 cyclical trough, not unlike the timing relation at earlier cyclical trough dates.

5. The Monetary Policy Problem in 2002

Following each of the six recessions since 1959, it was shown above that in some months the fed funds rate tended to be lower relative to the trough rate, and the monetary base in those months to be higher relative to the trough base. Easing monetary policy was the initial key Fed objective. Then the Fed tightened.

Chart 1 graphs monthly movements in the funds rate and the 12-month percent change in the base during cyclical expansions and contractions. The funds rate emerging from the recession of March 2001 is lower than it has been since 1959 except for a few months in 1961. The expansion of the monetary base during the seventh recession was rapid, reaching close to 10 percent at an annual rate by the trough date. Reflecting the expansion of the policy indicators, the growth rates of the monetary aggregates, M2 and MZM (Chart 2) at the trough date are about 20 percent per annum. Although the Fed regularly refers to the absence of inflation, Chart 3, which graphs the 12-month percent change in the headline CPI and the median CPI, tells a different story. The headline CPI at the trough indeed was growing at less than 2 percent, but the median CPI was nearly double that rate, at 3.8 percent. The prices of goods may be stable or falling, but the prices of services, which are three times as important as goods in the overall index are rising.

Coming out of recession, it would be perilous for the Fed to ease. To tighten, however, in view of the money aggregate and median CPI growth rates, might endanger the continuation of recovery. That is the current Fed dilemma. If price stability is the Fed's monetary policy goal, however, it cannot afford to do nothing. The median CPI annual growth rate has been creeping up from 3 percent in October 2000 to 3.8 percent in January 2002.

Paradoxically, the atypical low level of the fed funds rate at the trough date in 12/01 may provide the Fed some leeway to raise the funds rate without aborting the recovery. At the latest trough date the Fed funds rate was 1.82. In the six preceding trough dates, the funds rate ranged from a low of 2.54 in February 1961 to 9.20 in November 1982. If in the next seven months the Fed were to reverse the steps by which it lowered the funds rate by 1.75 percent after September 11, it could raise the rate each month by 25 basis points from April through October 2002. The funds rate at the latter date would stand at 3.57 percent, a rate the market might well regard as normal, with no deleterious effects on economic activity. The Fed's message would be that, just as it flooded the market with liquidity to keep recession from getting out of hand, it also was prepared to drain the pool of liquidity so as not to permit inflation to get out of hand. Moreover, one must not overlook the usual lag of results over action, so the effects of tightening will not be immediately evident either on output or inflation.

The federal funds rate futures indicate the market's expectation that the Fed will begin raising the funds rate. The Fed did not change the funds rate at its March 19, 2002, meeting but changed the wording of its announcement to state that "the risks are balanced with respect to the prospects for both" the goals of price stability and sustainable economic growth. It should act at its next meeting.

The task of combating the threat of rising inflation will not end with the reversal of the 1.75 decrease in the funds rate. It will only begin at that point.

Appendix

Real Indicators of Monetary Policy

To convert the nominal indicators into real indicators, the 12-month percentage change in the CPI is subtracted from the fed funds rate and the monetary base is divided by the CPI. Why

examine real indicators, when monetary policy is implemented with nominal indicators? One answer is that households and firms respond to real variables, not nominal ones.

How different from the nominal indicators are the business cycle patterns with real indicators of monetary policy? The real fed funds rate is higher than at the trough in most months preceding the trough date. Exceptions occur in four of the six cycles in the months closest to the trough, when the real rate is lower than at the trough. The real monetary base is higher than at the trough or is equal to the trough value until the last six months before the trough, when in four of the six cycles the real base is lower. The real base appears to be more expansive than the real funds rate during cyclical expansions. After the trough date, the real federal funds rate tends to exceed the trough value, suggesting tighter policy during recovery. The pattern of the real monetary base during recovery differs. The real base then tends to be higher than at the trough, suggesting expansionary effects.

It is not surprising that there is a lack of one-to-one correspondence between movements in the funds rate and the monetary base. The currency component of the base is not responsive to changes in the fed funds rate. Which indicator of monetary policy is dominant is not obvious from the tables on which these comments are based.

Table 1

BUSINESS CYCLE PATTERNS (normalized on trough)

Yellow indicates business cycle peak.

Green indicates observations that overlap.

NOMINAL federal funds basis point spreads; federal funds rate before (T-i), and after (T+i) the trough (T) minus federal funds rate at the trough.

Trough:	<u>T-24</u>	<u>T-23</u>	<u>T-22</u>	<u>T-21</u>	<u>T-20</u>	<u>T-19</u>	<u>T-18</u>	<u>T-17</u>	<u>T-16</u>	<u>T-15</u>	<u>T-14</u>	<u>T-13</u>	<u>T-12</u>	<u>T-11</u>	<u>T-10</u>	<u>T-9</u>	<u>T-8</u>	<u>T-7</u>
Feb-61	-0.1	0.3	0.4	0.4	0.9	0.9	1.0	1.2	1.4	1.5	1.5	1.5	1.4	1.3	1.4	1.3	0.8	0.7
Nov-70	0.2	0.4	0.7	1.0	1.2	1.8	3.1	3.3	3.0	3.6	3.6	3.4	3.3	3.4	3.4	3.4	2.2	2.5
Mar-75	1.6	1.6	2.3	3.0	4.9	5.0	5.2	4.5	4.5	4.4	4.1	3.4	3.8	5.0	5.8	6.4	7.4	6.5
Jul-80	-1.2	-1.0	-0.6	-0.1	0.7	1.0	1.0	1.0	1.1	1.0	1.2	1.3	1.4	1.9	2.4	4.7	4.2	4.8
Nov-82	6.7	9.7	9.9	6.7	5.5	6.5	9.3	9.9	9.8	8.6	6.7	5.9	4.1	3.2	4.0	5.6	5.5	5.7
Mar-91	3.7	3.7	3.7	3.4	3.1	2.9	2.9	2.7	2.4	2.3	2.1	2.1	2.2	2.1	2.1	2.2	2.0	2.0

Averages:

Six cycles:	1.8	2.4	2.7	2.4	2.7	3.0	3.8	3.8	3.7	3.6	3.2	2.9	2.7	2.8	3.2	3.9	3.7	3.7
Adjusted:	0.8	1.0	1.3	1.5	2.2	2.3	2.6	2.5	2.5	2.6	2.5	2.3	2.4	2.7	3.0	3.6	3.3	3.3

REAL federal funds basis points spread; federal funds rate before (T-i), and after (T+i) the trough (T) minus federal funds rate at the trough.

Trough:	<u>T-24</u>	<u>T-23</u>	<u>T-22</u>	<u>T-21</u>	<u>T-20</u>	<u>T-19</u>	<u>T-18</u>	<u>T-17</u>	<u>T-16</u>	<u>T-15</u>	<u>T-14</u>	<u>T-13</u>	<u>T-12</u>	<u>T-11</u>	<u>T-10</u>	<u>T-9</u>	<u>T-8</u>	<u>T-7</u>
Feb-61												1.4	1.4	1.3	1.0	0.6	0.4	0.7
Nov-70	1.4	1.3	1.6	1.9	1.5	1.9	3.2	3.4	3.2	3.8	3.5	3.3	2.9	3.1	2.8	2.6	1.7	2.0
Mar-75	7.2	6.7	7.2	7.4	9.6	8.0	8.3	6.9	6.7	5.9	5.0	3.9	4.1	5.4	5.5	6.0	6.3	6.0
Jul-80	4.2	4.3	4.1	4.2	5.0	5.2	4.9	4.3	4.0	3.6	3.7	3.3	3.1	3.2	3.7	5.8	4.7	4.6
Nov-82	-1.5	1.8	2.6	-0.2	-0.6	0.9	4.0	4.7	3.5	2.3	0.2	0.1	-1.0	-1.3	0.2	2.4	3.1	3.6
Mar-91	3.7	3.5	3.2	3.1	2.9	3.1	3.3	3.0	2.6	2.5	1.7	1.7	1.7	2.2	2.5	2.3	2.0	1.1

Averages:

Six cycles:	3.0	3.5	3.7	3.3	3.7	3.8	4.7	4.5	4.0	3.6	2.8	2.3	2.1	2.3	2.6	3.3	3.0	3.0
Adjusted:	3.3	3.2	3.2	3.3	3.8	3.6	3.9	3.5	3.3	3.2	2.8	2.7	2.7	3.0	3.1	3.5	3.0	2.9

Table 1 (continued)

NOMINAL federal funds basis point spreads; federal funds rate before (T-i), and after (T+i) the trough (T) minus federal funds rate at the trough.

Trough:	<u>T-6</u>	<u>T-5</u>	<u>T-4</u>	<u>T-3</u>	<u>T-2</u>	<u>T-1</u>	<u>T</u>	<u>T+1</u>	<u>T+2</u>	<u>T+3</u>	<u>T+4</u>	<u>T+5</u>	<u>T+6</u>	<u>T+7</u>	<u>T+8</u>	<u>T+9</u>	<u>T+10</u>
Feb-61	0.4	0.1	-0.1	-0.1	-0.6	-1.1	0.0	-0.5	-1.1	-0.6	-0.8	-1.4	-0.5	-0.7	-0.3	0.1	-0.2
Nov-70	2.3	2.0	1.6	1.0	0.7	0.6	0.0	-0.7	-1.5	-1.9	-1.9	-1.5	-1.0	-0.7	-0.3	0.0	0.0
Mar-75	5.8	4.5	3.9	3.0	1.6	0.7	0.0	0.0	-0.3	0.0	0.6	0.6	0.7	0.3	-0.3	-0.3	-0.7
Jul-80	4.8	5.1	8.2	8.6	2.0	0.4	0.0	0.6	1.8	3.8	6.8	9.9	10.1	6.9	5.7	6.7	9.5
Nov-82	5.3	5.0	3.4	0.9	1.1	0.5	0.0	-0.3	-0.5	-0.7	-0.4	-0.4	-0.6	-0.2	0.2	0.4	0.3
Mar-91	2.1	2.0	1.7	1.2	0.8	0.1	0.0	-0.2	-0.3	-0.2	-0.3	-0.5	-0.7	-0.9	-1.3	-1.7	-2.1
Averages:																	
Six cycles:	3.5	3.1	3.1	2.4	0.9	0.2	0.0	-0.2	-0.3	0.1	0.7	1.1	1.3	0.8	0.6	0.8	1.1
Adjusted:	3.1	2.7	3.1					-0.6	-0.6	-0.4	-0.4	-0.6	-0.4	-0.4	-0.4	-0.3	-0.6

REAL federal funds basis points spread; federal funds rate before (T-i), and after (T+i) the trough (T) minus federal funds rate at the trough.

Trough:	<u>T-6</u>	<u>T-5</u>	<u>T-4</u>	<u>T-3</u>	<u>T-2</u>	<u>T-1</u>	<u>T</u>	<u>T+1</u>	<u>T+2</u>	<u>T+3</u>	<u>T+4</u>	<u>T+5</u>	<u>T+6</u>	<u>T+7</u>	<u>T+8</u>	<u>T+9</u>	<u>T+10</u>
Feb-61	0.4	0.4	-0.1	-0.1	-0.6	-1.1	0.0	-0.5	-0.7	0.1	-0.1	-1.0	-0.2	-0.7	0.4	0.8	0.5
Nov-70	1.9	1.6	1.5	0.9	0.6	0.6	0.0	-0.7	-1.1	-1.0	-0.7	0.0	0.2	0.5	0.9	1.2	1.5
Mar-75	4.3	3.1	2.2	1.4	0.3	0.0	0.0	0.2	0.9	1.3	1.5	2.4	3.3	3.1	2.8	3.0	3.1
Jul-80	4.1	4.1	6.7	7.1	0.7	-0.7	0.0	0.8	2.2	4.3	7.3	10.7	11.4	8.7	8.2	9.7	12.8
Nov-82	2.8	2.2	1.3	-0.6	0.6	0.0	0.0	0.4	0.2	0.3	0.5	0.1	0.5	1.8	2.3	2.4	2.0
Mar-91	0.7	0.4	0.3	-0.2	0.0	-0.4	0.0	-0.2	-0.6	-0.1	0.2	0.6	0.8	1.1	0.4	0.2	0.1
Averages:																	
Six cycles:	2.4	2.0	2.0	1.4	0.3	-0.3	0.0	0.0	0.2	0.8	1.4	2.1	2.7	2.4	2.5	2.9	3.3
Adjusted:	2.3	1.9	2.1					0.2	0.4	0.2	0.2	0.4	0.9	1.2	1.4	1.5	1.4

Table 1 (concluded)

NOMINAL federal funds basis point spreads; federal funds rate before (T-i), and after (T+i) the trough (T) minus federal funds rate at the trough.

Trough:	<u>T+11</u>	<u>T+12</u>	<u>T+13</u>	<u>T+14</u>	<u>T+15</u>	<u>T+16</u>	<u>T+17</u>	<u>T+18</u>	<u>T+19</u>	<u>T+20</u>	<u>T+21</u>	<u>T+22</u>	<u>T+23</u>	<u>T+24</u>
Feb-61	-0.4	-0.2	0.3	0.2	-0.2	0.1	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Nov-70	-0.4	-0.7	-1.5	-2.1	-2.3	-1.8	-1.4	-1.3	-1.1	-1.1	-0.8	-0.7	-0.6	-0.5
Mar-75	-0.8	-0.7	-0.7	-0.3	-0.1	-0.2	-0.3	-0.3	-0.5	-0.6	-0.9	-0.9	-0.9	-0.9
Jul-80	10.1	10.0	8.8	6.8	6.1	4.3	3.3	4.2	5.8	5.7	5.9	5.4	5.1	3.6
Nov-82	0.3	0.1	0.3	0.4	0.4	0.7	1.1	1.1	1.9	2.0	2.4	2.1	0.8	0.2
Mar-91	-2.1	-2.1	-2.4	-2.3	-2.4	-2.9	-2.8	-2.9	-3.0	-3.0	-3.2	-3.1	-3.1	-3.1

Averages:

Six cycles:	1.1	1.1	0.8	0.5	0.3	0.0	0.0	0.2	0.5	0.6	0.6	0.5	0.3	0.0
Adjusted:	-0.7	-0.7	-0.8	-0.8	-0.9	-0.8	-0.6	-0.6	-0.5	-0.5	-0.4	-0.5	-0.7	-0.8

REAL federal funds basis points spread; federal funds rate before (T-i), and after (T+i) the trough (T) minus federal funds rate at the trough.

Trough:	<u>T+11</u>	<u>T+12</u>	<u>T+13</u>	<u>T+14</u>	<u>T+15</u>	<u>T+16</u>	<u>T+17</u>	<u>T+18</u>	<u>T+19</u>	<u>T+20</u>	<u>T+21</u>	<u>T+22</u>	<u>T+23</u>	<u>T+24</u>
Feb-61	0.3	0.2	0.3	0.3	-0.2	0.2	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Nov-70	1.4	1.4	0.9	0.2	-0.5	0.3	0.7	1.0	1.5	1.6	1.9	1.7	1.9	1.6
Mar-75	3.4	3.7	3.9	4.0	4.4	4.7	4.5	4.7	4.5	4.8	4.5	4.3	3.5	3.2
Jul-80	13.5	12.4	11.1	9.0	8.9	7.9	7.6	9.1	11.3	11.9	12.4	11.7	11.1	10.2
Nov-82	2.0	1.5	1.0	0.5	0.2	0.3	1.0	1.3	2.0	2.2	2.6	2.3	1.0	0.6
Mar-91	-0.1	-0.5	-0.8	-0.5	-0.6	-1.2	-1.1	-1.1	-1.5	-1.3	-1.3	-1.5	-1.5	-1.2

Averages:

Six cycles:	3.4	3.1	2.7	2.3	2.1	2.0	2.2	2.6	3.0	3.3	3.4	3.1	2.7	2.5
Adjusted:	1.4	1.2	1.1	0.9	0.7	0.9	1.1	1.3	1.4	1.5	1.6	1.4	1.1	0.9

Table 2

BUSINESS CYCLE PATTERNS (normalized on trough)

NOMINAL monetary base; index equals 100 in trough period.

Trough:	<u>T-24</u>	<u>T-23</u>	<u>T-22</u>	<u>T-21</u>	<u>T-20</u>	<u>T-19</u>	<u>T-18</u>	<u>T-17</u>	<u>T-16</u>	<u>T-15</u>	<u>T-14</u>	<u>T-13</u>	<u>T-12</u>	<u>T-11</u>	<u>T-10</u>	<u>T-9</u>	<u>T-8</u>	<u>T-7</u>
Feb-61	99.2	99.2	99.4	99.5	99.5	99.9	100.1	100.2	99.9	99.7	99.8	99.6	99.3	99.2	99.2	99.3	99.4	99.6
Nov-70	89.6	90.4	90.7	91.2	91.4	91.5	92.2	92.6	92.5	93.1	93.5	93.9	94.8	95.3	95.7	95.9	96.3	97.0
Mar-75	86.2	86.6	87.0	87.5	88.3	88.6	89.2	90.2	90.5	91.2	92.1	92.6	93.2	94.0	95.0	95.5	96.1	96.7
Jul-80	85.1	85.6	86.4	87.1	87.6	88.1	88.8	88.9	89.3	89.9	90.4	91.2	92.1	93.0	93.9	94.7	95.4	96.0
Nov-82	89.2	89.5	89.2	89.7	90.1	90.7	91.1	91.4	91.9	92.3	92.6	92.7	93.1	93.9	94.5	94.8	95.0	95.5
Mar-91	85.6	85.7	86.0	86.3	86.6	86.8	87.1	87.5	87.8	88.5	89.1	89.6	90.2	90.9	91.4	92.2	92.8	93.9

Averages:

Six cycles:	89.2	89.5	89.8	90.2	90.6	90.9	91.4	91.8	92.0	92.4	92.9	93.3	93.8	94.4	95.0	95.4	95.8	96.5
Adjusted:	89.2	89.5	89.9	90.3	90.7	91.0	91.5	91.9	92.0	92.5	93.0	93.4	93.9	94.5	95.0	95.5	96.0	96.6

REAL monetary base before (-) and after (+) the business cycle trough (T).

Trough:	<u>T-24</u>	<u>T-23</u>	<u>T-22</u>	<u>T-21</u>	<u>T-20</u>	<u>T-19</u>	<u>T-18</u>	<u>T-17</u>	<u>T-16</u>	<u>T-15</u>	<u>T-14</u>	<u>T-13</u>	<u>T-12</u>	<u>T-11</u>	<u>T-10</u>	<u>T-9</u>	<u>T-8</u>	<u>T-7</u>
Feb-61	101.9	101.9	102.1	102.2	101.9	101.9	102.2	101.9	101.3	101.1	101.2	101.0	100.7	100.5	100.2	99.9	100.0	100.3
Nov-70	100.3	100.5	100.7	100.9	100.2	99.8	100.3	100.2	99.5	99.9	99.8	99.7	100.1	100.2	100.0	99.7	99.6	99.8
Mar-75	104.9	104.6	104.7	104.6	105.5	104.0	104.2	104.4	104.1	104.0	103.9	103.4	102.9	103.2	103.2	102.9	102.9	102.3
Jul-80	107.3	107.2	107.4	107.2	107.2	107.2	107.0	106.1	105.6	105.2	104.6	104.4	104.2	104.2	104.3	104.1	103.7	103.1
Nov-82	102.1	101.5	100.2	99.9	99.7	99.8	99.6	99.0	98.4	98.1	97.5	97.3	97.3	97.8	98.1	98.1	98.3	98.6
Mar-91	94.5	93.9	93.7	93.7	93.8	94.0	94.1	94.1	94.0	94.4	94.2	94.3	94.6	95.1	95.5	95.6	95.9	96.2

Averages:

Six cycles:	101.8	101.6	101.5	101.4	101.4	101.1	101.2	100.9	100.5	100.4	100.2	100.0	100.0	100.2	100.2	100.1	100.1	100.0
Adjusted:	101.8	101.6	101.7	101.7	101.7	101.4	101.6	101.3	100.9	100.9	100.7	100.5	100.5	100.7	100.6	100.4	100.4	100.3

Table 2 (continued)

NOMINAL monetary base; index equals 100 in trough period.

Trough:	<u>I-6</u>	<u>I-5</u>	<u>I-4</u>	<u>I-3</u>	<u>I-2</u>	<u>I-1</u>	<u>I</u>	<u>I+1</u>	<u>I+2</u>	<u>I+3</u>	<u>I+4</u>	<u>I+5</u>	<u>I+6</u>	<u>I+7</u>	<u>I+8</u>	<u>I+9</u>	<u>I+10</u>
Feb-61	99.9	100.2	100.4	100.5	100.1	100.0	100.0	99.8	99.7	99.6	99.9	100.1	100.7	101.2	101.7	102.0	102.2
Nov-70	97.5	97.9	98.3	98.7	99.2	99.6	100.0	100.7	101.5	102.3	102.8	103.3	104.2	104.8	105.5	105.9	106.5
Mar-75	97.1	97.3	97.9	98.4	98.7	99.2	100.0	100.2	100.8	102.1	102.8	103.1	103.6	104.0	105.0	105.6	106.0
Jul-80	96.6	97.2	97.8	98.6	98.8	99.3	100.0	101.0	101.9	102.6	103.6	103.9	103.5	104.1	104.7	105.3	105.8
Nov-82	96.3	97.0	97.3	98.0	98.7	99.4	100.0	100.9	101.6	102.8	104.0	105.0	105.8	106.8	107.2	107.9	108.7
Mar-91	94.9	95.6	96.2	96.9	98.4	99.4	100.0	100.1	100.5	100.9	101.5	102.2	102.7	103.3	104.1	104.9	105.6

Averages:

Six cycles:	97.1	97.5	98.0	98.5	99.0	99.5	100.0	100.4	101.0	101.7	102.4	102.9	103.4	104.0	104.7	105.3	105.8
Adjusted:	97.2	97.6	98.1							102.2	102.7	103.4	104.0	104.7	105.3	105.8	

REAL monetary base before (-) and after (+) the business cycle trough (T).

Trough:	<u>I-6</u>	<u>I-5</u>	<u>I-4</u>	<u>I-3</u>	<u>I-2</u>	<u>I-1</u>	<u>I</u>	<u>I+1</u>	<u>I+2</u>	<u>I+3</u>	<u>I+4</u>	<u>I+5</u>	<u>I+6</u>	<u>I+7</u>	<u>I+8</u>	<u>I+9</u>	<u>I+10</u>
Feb-61	100.6	100.9	100.4	100.5	100.1	100.0	100.0	99.8	99.7	99.6	99.9	99.8	100.4	100.5	101.0	101.4	101.5
Nov-70	100.1	99.9	100.0	100.2	100.3	100.1	100.0	100.2	100.7	101.5	101.8	102.1	102.4	102.5	102.9	103.1	103.3
Mar-75	101.4	100.7	100.4	100.2	99.6	99.6	100.0	99.8	100.2	100.8	100.5	100.5	100.2	100.0	100.3	100.3	100.3
Jul-80	102.3	101.6	100.8	100.7	99.9	99.4	100.0	100.3	100.3	100.0	100.0	99.4	98.1	97.7	97.6	97.6	97.4
Nov-82	98.5	98.0	97.8	98.3	99.0	99.3	100.0	101.2	101.7	102.8	103.9	104.1	104.5	105.3	105.3	105.6	106.1
Mar-91	96.6	96.6	97.0	97.3	98.4	99.4	100.0	99.9	99.9	100.0	100.5	100.9	101.0	101.5	101.8	102.3	102.9

Averages:

Six cycles:	99.9	99.6	99.4	99.5	99.6	99.6	100.0	100.2	100.4	100.8	101.1	101.1	101.1	101.2	101.5	101.7	101.9
Adjusted:	100.2	99.9	99.7							101.3	101.4	101.7	101.7	101.9	102.3	102.5	102.8

Table 2 (concluded)

NOMINAL monetary base; index equals 100 in trough period.

Trough:	<u>T+11</u>	<u>T+12</u>	<u>T+13</u>	<u>T+14</u>	<u>T+15</u>	<u>T+16</u>	<u>T+17</u>	<u>T+18</u>	<u>T+19</u>	<u>T+20</u>	<u>T+21</u>	<u>T+22</u>	<u>T+23</u>	<u>T+24</u>
Feb-61	102.2	102.1	102.4	102.8	103.1	103.2	103.5	103.8	103.9	104.3	104.7	104.9	105.0	105.4
Nov-70	106.2	106.7	107.0	108.2	109.0	109.7	110.0	110.8	111.2	111.8	112.5	113.0	114.0	115.2
Mar-75	106.9	107.7	108.5	109.4	109.9	110.5	111.2	111.8	112.5	113.5	114.2	115.0	115.5	116.2
Jul-80	106.1	106.7	107.2	107.5	107.6	108.1	109.1	109.8	110.1	110.3	111.0	111.9	112.6	113.0
Nov-82	109.4	110.0	110.6	111.5	112.1	112.8	113.4	113.9	114.7	115.3	115.8	116.4	116.7	117.3
Mar-91	106.6	107.1	107.9	108.6	109.1	110.1	111.3	112.6	113.9	114.9	115.9	116.8	117.4	118.2

Averages:

Six cycles:	106.2	106.7	107.3	108.0	108.5	109.1	109.8	110.4	111.1	111.7	112.3	113.0	113.6	114.2
Adjusted:	106.3	106.7	107.3	108.1	108.6	109.2	109.9	110.6	111.2	111.9	112.6	113.2	113.7	114.5

REAL monetary base before (-) and after (+) the business cycle trough (T).

Trough:	<u>T+11</u>	<u>T+12</u>	<u>T+13</u>	<u>T+14</u>	<u>T+15</u>	<u>T+16</u>	<u>T+17</u>	<u>T+18</u>	<u>T+19</u>	<u>T+20</u>	<u>T+21</u>	<u>T+22</u>	<u>T+23</u>	<u>T+24</u>
Feb-61	101.6	101.1	101.0	101.4	101.7	101.8	102.2	102.1	101.8	102.2	102.6	102.8	103.0	103.0
Nov-70	102.9	103.0	103.1	104.0	104.2	104.9	105.0	105.4	105.6	105.9	106.3	106.3	107.0	107.6
Mar-75	101.0	101.6	102.1	102.4	102.4	102.3	102.5	102.5	102.6	103.1	103.2	103.4	102.8	103.0
Jul-80	96.9	96.4	96.0	95.4	95.2	95.2	95.7	96.1	96.0	96.2	96.5	96.4	95.9	95.7
Nov-82	106.4	106.7	106.9	107.0	107.1	107.4	107.6	107.9	108.4	108.6	108.7	108.9	108.9	109.2
Mar-91	103.7	103.8	104.4	104.8	104.9	105.6	106.6	107.6	108.3	109.0	109.8	110.3	110.6	111.2

Averages:

Six cycles:	102.0	102.1	102.3	102.5	102.6	102.9	103.2	103.6	103.8	104.2	104.5	104.7	104.7	104.9
Adjusted:	103.1	103.2	103.5	103.9	104.1	104.4	104.8	105.1	105.4	105.8	106.1	106.4	106.5	106.8

Table 3

Timing of Funds Rate Peak and Cycle Dates

Federal Funds Rate		Cycle Peak Date	Lead (-) or Lag (+) in Months of Peak Rate	Cycle Trough Date	Lead (-) or Lag (+) in Months of Peak Rate
<u>Peak</u>	<u>Date</u>				
4.00	11/59	4/60	-5	2/61	-15
9.19	8/69	12/69	-4	11/70	-15
12.92	7/74	11/73	+8	3/75	-8
17.61	4/80	1/80	+3	7/80	-3
19.10	6/81	7/81	-1	11/82	-17
9.85	3/89	7/90	-16	3/91	-24
6.54	7/00	3/01	-8	12/01 ^a	-17

^(a)Tentative