



BOARD OF GOVERNORS
OF THE
FEDERAL RESERVE SYSTEM
WASHINGTON, D. C. 20551

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CONFIDENTIAL (FR)

TO: Federal Open Market Committee
FROM: Arthur L. Broida

Attached is the first stage report of the Subcommittee on the Directive. This Subcommittee is chaired by Governor Holland, and includes Messrs. Balles, Morris, and Wallich. It is expected that discussion of this report will be scheduled at an appropriate Committee meeting.

Attachment

(Confidential FR)

To: Federal Open Market
Committee

Date: December 23, 1974

From: Subcommittee on the
Directive

Subject: Improvements in the
Directive: Stage I

Introduction and Summary of Conclusions

At its July 1973 meeting, the Federal Open Market Committee established the Subcommittee on the Directive to undertake a thorough reconsideration of the Committee's procedures for formulating and implementing domestic policy directives. To carry out its charge, the Subcommittee divided its work into three stages and launched an extensive System-wide research program for each stage. This report sets forth the Subcommittee's conclusions and recommendations reached in the first stage of its inquiry.

The objective of the first stage has been limited to evaluating alternative reserve measures that might serve, in place of RPD, as short-term operating targets in an aggregate-oriented approach to policy. Stage II of the Subcommittee's work will appraise the merits of these operating targets against other possible short-run targets, such as the Federal funds rate or other indicators of money market conditions. Combinations of operating targets also will be considered. In addition, Stage II will evaluate whether pursuit of intermediate targets, such as the monetary aggregates or interest rates, is helpful in formulating monetary policy, and if so, which intermediate target (s) are "best." In the third and final stage, the Subcommittee will attempt to identify possible regulatory and institutional changes that

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might produce a more effective execution of monetary policy in the reasonably foreseeable future.

This report is limited to the conclusions and recommendations reached in Stage I of the Subcommittee's work. It is hoped that Stage II will be completed by early next year. Assuming that the FOMC is agreeable, the Subcommittee plans to arrange for nonconfidential portions of its work on Stages I and II to be reviewed and discussed by some leading academic economists. The final stage will be extended over a longer period.

The Subcommittee recommends:

1) The FOMC should move toward replacing RPD with nonborrowed reserves (NBR). This step can and should be undertaken without placing exclusive reliance on a reserve-measure as an operating target and while recognizing that none of the various reserve measures promise precise control over the monetary aggregates in the short run.

2) The NBR target should be defined for the interval between FOMC meetings (as illustrated in the appendix to this report) rather than for the moving two-month horizon used for RPD.

3) Insofar as the FOMC directs the Manager to utilize this reserve target, the Manager normally should not attempt to "look through" NBR to the monetary aggregates, but rather

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should attempt to maintain his operating reserve target within a specified range of tolerance. However, staff materials and, in some degree, the record of FOMC actions should include the principal assumptions that underlie the projected multiplier relationships between NBR and the monetary aggregates. These assumptions would include, among other things, projected member bank borrowing (with, when significant, distinctions by type of borrowing--e.g., regular adjustment, seasonal, and emergency).

4) There should be provision for the Manager to consult with the Chairman to determine whether the NBR target should be changed in the interval between meetings should this target prove to be in conflict with other operating constraints, such as the Federal funds rate, or should the target clearly prove to be technically in error (because, for example, of an unexpectedly large rise in emergency borrowing that is leading to a sustained shift in the multiplier relationship between NBR and money).

5) Until such time as the FOMC acts finally on the proposals set forth herein, NBR should be added as a "shadow" target to be included in the materials prepared for the FOMC. This procedure will assist the FOMC in evaluating the desirability of adopting the alternative operating target in place of RPD and it will smooth the transition to NBR should that be the Committee's final decision.

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Procedures for Evaluating Instruments

The Subcommittee on the Directive believes that the RPD experiment begun in February 1972 has made an important contribution to improving the FOMC's operating procedures. The experiment has helped the FOMC focus on the relationships between its reserve-supplying actions and the behavior of the monetary aggregates, and has helped point up the difficulties in achieving control over the monetary aggregates when Federal funds rate movements are constrained. The experiment has also aided the Committee in clarifying the broader issues involved in the choice of appropriate operating and intermediate targets.

However, several problems have been encountered in pursuing the RPD experiment. First, RPD has proven to be very difficult for the Desk to control. Second, the multiplier relationships between RPD and the monetary aggregates are difficult to predict at times. Thus, the RPD concept has not always been a reliable guide for the FOMC in forming its decisions concerning either longer-term or inter-meeting monetary policy, nor in judging, after the fact, how well the Manager has complied with FOMC instructions. Finally, the RPD concept has proven deficient in terms of enhancing public understanding of monetary policy. As a result, the FOMC now places little or no emphasis on RPD and the measure has become virtually irrelevant to the Manager in his operations.

The Subcommittee took as its first order of business the search for a more reliable substitute for RPD as the FOMC's aggregate-oriented

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short-term operating target. The following candidates were considered: total member bank reserves, nonborrowed member bank reserves, RPD less reserves required to support large certificates of deposits, and three variants of the monetary base.^{1/} The following criteria were employed to evaluate each of these measures as a possible operating target.

1. Controllability. An operating target should be one that the Manager can control with reasonable precision over a weekly time period. This implies that the target must respond quickly and predictably to open market operations. Information about the target should be available to the Manager on a timely basis so that he can determine whether the operating target is on track and react quickly with open market operations should it deviate from path.

2. Predictability. The relationships between the operating target and the monetary aggregates would be reasonably stable and predictable.

3. Interest rate implications. The operating target should be evaluated in relation to its potential for introducing serious money market disturbances.

4. Public understanding. The operating target should enhance-- or at least not obscure--public understanding of monetary policy. The

^{1/} The monetary base measures the net monetary liabilities of the Federal Reserve and the Treasury to the private sector of the economy and consists of member bank reserves plus currency outside member banks. It is the base that underlies the stock of money balances held by the nonbank public. The variants of the base that were used include the source base, the non-borrowed source base and the monetary base. The source base consists of total reserves of member banks, vault cash held by nonmember banks, and currency held by the public. The nonborrowed source base is simply the source base less member bank borrowing. The monetary base is the source base adjusted to reflect changes in reserve requirements and changes in the size, type and distribution of deposits in the banking system. In this report, the more familiar terms of nonborrowed reserves plus currency and total reserves plus currency will be used for the nonborrowed source base and the source base respectively.

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behavior of the operating target should not be conducive to the formation of erroneous inferences concerning the intent of monetary policy by outside observers.

In making these evaluations, the Subcommittee had the benefit of a number of analytical papers prepared for it by members of the staffs of the Board and several Reserve Banks. Specific studies are cited whenever their findings are particularly relevant. A list of all the papers is provided at the end of this report and copies of these papers will be supplied by the Subcommittee on request.

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Evaluation of Alternative Operating Instruments

1. Controllability.^{2/} Total member bank reserves, total reserves plus currency, RPD, and RPD less reserves required to support large certificates of deposit all suffer from the deficiency that they are difficult, and at times impossible, to control in the short run. Borrowed reserves are a component of all these measures. Other things equal, attempts to change any of these measures will be frustrated in the short run by an offsetting response of bank borrowing.^{3/}

An example should make the point: assume that total reserves are used as the operating target and that they are growing more rapidly than the FOMC desires. Under these conditions, the Manager would reduce the availability of nonborrowed reserves in an attempt to reduce the growth of total reserves. Because required reserves are fixed in the short run, the banking system's first response to the reduced availability of nonborrowed reserves necessarily would be to borrow more at the discount window.^{4/} Thus, total reserves would be little affected in the first instance by Desk actions, but the mix between borrowed and nonborrowed reserves would change. The reduced availability of nonborrowed reserves,

^{2/} A detailed discussion of the controllability question is provided in "Alternative Operating Targets for Monetary Policy," by Rudolph Thunberg and in "On Controlling Monetary Aggregates via Base or Member Bank Reserve Concepts," by Dennis Starleaf.

^{3/} In this context, the term "borrowing" will denote adjustment borrowing by member banks.

^{4/} Lagged reserve accounting prevents the banking system from adjusting its required reserves in any statement week. Even if there were contemporaneous reserve accounting, the banking system would have only a small impact on its required reserves in any week.

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and increased debt to the Federal Reserve, would trigger bank portfolio adjustments, however, which would raise interest rates and set in motion a reduction in the growth of deposits and hence in required reserves. But this reaction takes time. Over weekly (or at times even monthly) intervals, the Manager would not be able to hit the target specified by the FOMC.

Thus, over short time intervals--which is the appropriate horizon for an operating target--the Desk would often be unable to carry out a directive specified in terms of an operating target that includes bank borrowing. In fact, with lagged reserve accounting, it sometimes would be impossible to reduce reserves sufficiently to hit the target.

In terms of the control criterion, the preferred alternatives as the operating target are either nonborrowed reserves or nonborrowed reserves plus currency (nonborrowed source base). Except for as-of adjustments, both measures are known with reasonable accuracy with a one-day lag. Weekly control is subject to errors in projecting other factors affecting reserves (principally float) and the availability of collateral for adding reserves. Relative to other candidates, both nonborrowed reserves and nonborrowed reserves plus currency could be controlled quite closely, even on a week-by-week basis.

The total of nonborrowed reserves and currency would be slightly easier to control than nonborrowed reserves alone. With a nonborrowed reserves plus currency target, it usually would not be

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necessary for the Desk to react to errors in currency projections. If currency unexpectedly rose or fell, nonborrowed reserves would move in the opposite direction so that the total would tend to remain unchanged. However, if the Desk were following a nonborrowed reserve target, an unexpected movement in currency would cause nonborrowed reserves to deviate from the desired path. The Manager would learn about this deviation in currency with a one-day lag, and would act to offset it in order to stay on the desired nonborrowed reserve path.

The problems of short-term control by the Desk associated with each of the alternative reserve or monetary base measures except nonborrowed reserves and nonborrowed reserves plus currency led the Subcommittee to consider only these latter two as serious alternatives to RPD as an operating target.

2. Interest rate implications. A nonborrowed reserve operating instrument appears preferable in terms of likely effects on interest rates. If nonborrowed reserves were the operating target, shifts in currency would be offset by open market operations and interest rates would not respond to currency movements. If the target were nonborrowed reserves plus currency, however, currency shifts would not elicit an offsetting Desk response because nonborrowed reserves would move in the opposite direction from currency. Thus, these changes in the availability of nonborrowed reserves would produce sharper interest rate fluctuations than would be the case under a nonborrowed reserves target. Available empirical evidence suggests that the superiority of

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nonborrowed reserves over nonborrowed reserves plus currency in terms of interest rate fluctuations is usually apt to be small in practice.^{5/} Infrequently, however, unexpected currency movements appear to be large enough to produce a considerable impact on the Federal funds rate if the Desk were instructed to achieve a target consisting of nonborrowed reserves plus currency.

Pursuit of any reserve or monetary base operating target that includes member bank borrowing would produce sharper interest rate fluctuations than those measures that exclude borrowing. The larger money market reactions would arise because the tendency for borrowing to offset changes in nonborrowed reserves would be resisted by the Desk. Assume that the Desk were following a target that includes bank borrowing, say total reserves. If total reserves growth were stronger than desired, the Desk would respond by reducing the growth in nonborrowed reserves thereby tending to increase the Federal funds rate. Banks would respond to this reduced reserve availability and the increased Federal funds rate in the first instance by increasing their borrowing from the Fed, so that total reserves would tend to return to their earlier value. The Desk would react again by reducing nonborrowed reserves. While the Desk would probably be unsuccessful in achieving its total reserve target in the short run, the attempt could produce large week-to-week movements in interest rates.

^{5/} See "Reserve Aggregate Target Experiment," August 12, 1974 memorandum to the Subcommittee by James L. Pierce.

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3. Public understanding. It is reasonable to expect that current values of broader measures such as total reserves or total reserves plus currency (source base) on average will move more closely with current values of the monetary aggregates than will nonborrowed reserves or nonborrowed reserves plus currency. In this sense, the broader measures would be preferable in enhancing public understanding of monetary policy. There are times, however, when the short-term movements in these broader measures will not accurately reflect the thrust of policy. For example, if a decision is made to reduce the growth in the aggregates, the growth of nonborrowed reserves will slow, but total reserves will continue to rise for a while because of an increase in borrowing in the short run. Only later, after banks are impelled to reduce deposit growth in order to repay their indebtedness to the Federal Reserve, will total reserves show a slower growth. In those cases, nonborrowed reserve movements would more accurately reflect the thrust of current policy.

However, the fact that occasionally banks have to be pushed much further into or out of debt to the Federal Reserve in order to impel a timely change in their deposit-creating behavior creates a problem of public perception. At times, the Desk would have to be told to strive for a change in a nonborrowed reserve target which in percentage terms would be much greater than the percentage change desired in overall deposits. To the unsophisticated reader of the FOMC policy record, such percentage changes in nonborrowed reserve

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targets would exaggerate the intended extent of monetary policy changes. This effect could presumably be forestalled to some degree by stating FOMC targets for nonborrowed reserves in terms of dollar levels or dollar changes rather than annualized percentage rates of change.

The more global measures such as total reserves or total reserves plus currency (the source base) will tend on average to move more closely with the monetary aggregates. Because the source base includes currency--a relatively large and stable component of M_1 and M_2 --it should show percentage changes most closely paralleling the monetary aggregates. It is important to recall that while these global measures create fewer interpretation problems for the public, they create the greatest control problems for the Desk. Table I shows the growth in the various candidates for the operating target along with the growth in the monetary aggregates. The greater similarity between the percentage changes in deposit aggregates and those in the measures that include currency can be discerned readily from the table.

On the other hand, there may be some difficulty in persuading the public that the use of an operating target that includes both currency and reserve balances can improve control over the broader deposit aggregates. The a priori logic of such a relationship is somewhat disconcerting, since currency in the hands of the non-bank public does not support deposit growth. Indeed, since currency in effect carries a 100 per cent reserve requirement, and demand deposits less than a 20 per cent reserve requirement, shifts in the public's

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money holdings from demand deposits to currency should absorb reserves and greatly restrict deposit growth. That the relationship between offsetting movements in currency and reserve balances turns out usually not to contract deposits (due to such factors as changes in deposit composition) is an empirical fact in the real world, but it may not be easy to explain to the public.

4. Predictability. It was expected that the broader reserve or monetary base measures, such as total reserves, total reserves plus currency or RPD would be more closely related to the monetary aggregates than would the more narrowly defined nonborrowed reserve measures. That is, it was expected that the multiplier relationship between the more inclusive operating targets and the aggregates would be more predictable. Surprisingly, the staff's empirical results did not support this expectation; the broader, more difficult to control reserve or base measures did not consistently perform better than the narrower, more controllable measures. When sophisticated methods are used to estimate the relationships involved, the multipliers between the narrower measures and the monetary aggregates proved to be about equally predictable.

The empirical evidence was examined in several different ways.^{6/}
The most successful effort in terms of predicting M_1 and M_2 was one in

^{6/} A detailed discussion of the analysis is provided in "Reserve Measures as Operating Variables of Monetary Policy: an Empirical Analysis" by Daniel Laufenberg and in "Money Stock Control: an Aggregate Approach," by Albert Burger.

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which both current and lagged values of the operating target were related to M_1 and M_2 directly by regression analysis.^{7/}

As shown in Tables II-V, the regression analysis results showed remarkably little difference among the error performances outside the sample period for any of the operating target measures that were used. However, the error statistics indicate that for predicting M_1 and M_2 even one month into the future, sizable errors were made by using any of the measures.

The size of the errors highlights the fact that adoption of any single reserve measure as an operating target probably would not result in a marked improvement in the accuracy of control over the aggregates in the short run. The errors obtained by using the regression technique are fairly close to those that have been experienced recently in bluebook projections.

Table III indicates that for the months outside the sample period, nonborrowed reserves appears to have a slight edge in terms of predicting M_1 . Nonborrowed reserves plus currency (nonborrowed source base) appears to be somewhat more closely related to M_2 . Additional staff work suggests that the monthly multiplier errors for this and the other alternative operating instruments tend to be offset from month to month, so control of the monetary aggregates should be

^{7/} In these regressions all reserve measures were adjusted for changes in legal reserve requirements. The monetary base measures were not adjusted for changes in required reserves associated with changes in deposit mix.

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fairly close over a calendar quarter (see Table VI for details).^{8/} If the growth in the aggregates is stronger than expected in a particular month, given the growth in nonborrowed reserves, it is likely that the growth in the aggregates will be weaker than expected in subsequent months. This finding implies that it is preferable for the Desk to stay on the established reserve path since short-run deviations in the monetary aggregates from their expected values tend to be self-correcting.

In evaluating these results, it is important to keep several factors in mind. First, it is possible that the errors indicated in the statistical results could be decreased by adjusting the estimates to reflect judgmental factors in much the same way as is done currently in preparing the bluebook. Second, control over the monetary aggregates will be worsened whenever the range of tolerance for the Federal funds rate is too narrow to allow the appropriate movements in the operating target. The Subcommittee has not yet carried out studies far enough to determine whether or not it should recommend adjustments in the operating constraints on the Federal funds rate. This determination will come in phase II of the Subcommittee's work.

Finally, it should be noted that there are technical reasons for suspecting that the statistical results may understate the errors in controlling the aggregates through a reserve operating target.^{9/}

^{8/} For additional supporting evidence, see Albert Burger, "Money Stock Control: An Aggregate Approach."

^{9/} For a more detailed discussion, see "Interim Staff Report to the Subcommittee on the Directive", June 12, 1974 memorandum by James L Pierce and John H. Kalchbrenner.

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These results were obtained from data generated during a period in which a reserve measure was not used exclusively as the operating target. The actual short-run implementation of monetary policy was conducted in terms of operations on both RPD and the Federal funds rate, and the intermediate targets themselves were given weight when the multipliers appeared to be in error.

Under these circumstances, whenever the funds rate approached the limits of its allowable range, the Manager would provide or withdraw a sufficient volume of reserves to maintain the funds rate within the range. This process permitted the monetary aggregates to expand or contract along with increases or decreases in the demand for money. Thus, in part, reserves were reacting to the growth in the aggregates rather than the aggregates responding to reserves. The results indicate the closeness of the relationships in the data, but do not prove the direction of causation. On these grounds, actual use of these measures as operating targets could yield greater errors for the monetary aggregates than the empirical evidence indicates.

Summary of Evaluation Results

The evaluation of each of the alternative operating targets suggests the following conclusions:

1. Controllability: nonborrowed reserves plus currency or nonborrowed reserves are the preferred targets.
2. Interest rate variability: nonborrowed reserves is the preferred measure, but apparently only marginally so.

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3. Public understanding: a broad measure such as total reserves or the monetary base is preferable.
4. Predictability: the evidence is not totally convincing. Taken at face value, the lowest errors in predicting M_1 were achieved using nonborrowed reserves and the lowest errors for predicting M_2 were achieved using nonborrowed reserves plus currency. However, the margin of superiority was not great in either case and several reasons exist to view the results with caution.

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Recommendations

The Subcommittee recommends that the FOMC move toward replacing RPD with nonborrowed reserves as its short-term quantitative operating target. The nonborrowed reserves measure was preferable or nearly preferable on all but one of the four evaluation criteria--public understanding. To more nearly satisfy this latter criterion, the Subcommittee recommends that staff materials, and in some degree the record of FOMC actions, include a statement of the principal assumptions and projections concerning borrowing, excess reserves and deposit mix that underlie the multiplier relationship between NBR and the monetary aggregates. The availability of this information would generally increase public understanding of current monetary policy, and reduce the likelihood of misinterpretation when NBR moves in a direction counter to the thrust of monetary policy.

The Subcommittee believes that a change from RPD to NBR is a natural, understandable progression. Furthermore, adoption of NBR as the operating target does not preclude the addition of currency to the target at a later date (i.e., a switch from nonborrowed reserves to the nonborrowed source base) should experience indicate that this further evolution is desirable.

The Subcommittee also recommends that the path for the NBR target only be defined for the interval between FOMC meetings. The current procedure involves the specification of moving two-month paths for both the intermediate targets M_1 and M_2 , and the operating target RPD.

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This makes it difficult for the FOMC to appraise how well its objectives are being achieved monthly by blurring the distinction between errors in hitting the target and policy-directed changes in the target itself from month to month. Adoption of the interval between meetings as the target period would allow this distinction to be observed. Because the Manager could hit a NBR target with reasonable accuracy, there is no reason to use the moving two-month horizon for the operating target. The NBR target should be described as the dollar change from the previous intra-meeting period in the level of the target to be attained on average over the next four or five week interval. In order to allow for interferences from a variety of factors, it is suggested that the instructions include a tolerable range of error of \pm \$50 million.^{10/}

As shown in Table VI, evidence compiled by the staff suggests that over time errors in the relationship between nonborrowed reserves and the monetary aggregates tend to be offsetting. Thus, it does not appear that it would be productive to "look through" nonborrowed reserves to the aggregates. For this reason, the Subcommittee recommends that the Manager be instructed not to make adjustments for apparent multiplier errors in the interval between meetings but rather to adhere to the assigned nonborrowed reserve path provided that the funds rate remains within its range of tolerance.

^{10/} This figure, it should be noted, represents a tolerance range around a 4 or 5 week average. Errors in projections of reserve factors may be larger than \$50 million in any given week, but these errors will tend to be offsetting over a longer period. At the current level of nonborrowed reserves, a tolerance of \pm \$50 million represents an annual rate of change in a range of a little over 3 per cent. For a more extended discussion of these projection errors, see "Preliminary Investigations into Nonborrowed Reserve Projection Errors," November 26, 1974 memorandum by Sheila Tschinkel.

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However, the Manager should be instructed to consult with the Chairman if it becomes apparent that the NBR target cannot be achieved within the established Federal funds rate constraint. In addition, when sizable, sustained and apparently explainable deviations in the assumed multiplier relationships between NBR and the monetary aggregates develop between meetings, there should be provision for the Manager to consult with the Chairman concerning possible adjustment of the target. For example, when a large volume of emergency borrowing occurs, it would become necessary to adjust the nonborrowed reserve path. The adjustments in the multiplier and hence in NBR would depend upon reactions by the emergency bank and other banks to the situation that develops, with the extent of portfolio adjustments and shifts in banks' demands for free reserves governing the size of adjustment needed in NBR. Hence the adjustment of the NBR path does not lend itself to a predetermined formula but rather would have to be determined in light of prevailing circumstances.

The possibility of adopting an interest rate target or money market condition as either the sole or supplementary operating target has not been excluded by the Subcommittee. The results of these alternatives relative to the reserve measures will be evaluated in stage II of the Subcommittee's investigation.

Until such time as the FOMC acts finally on the substantive recommendations contained herein, the Subcommittee recommends NBR

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be added as a "shadow" target to be included in the materials prepared for FOMC use on a continuing basis. It is felt that the process of tracking the proposed alternative target will assist the FOMC in evaluating the desirability of adopting NBR in place of RPD; further, it will smooth the transition from one instrument to the other if that should be the Committee's final decision. An example of the manner in which these materials would be presented is included as an appendix to this report.

APPENDIX

Paragraph on Nonborrowed Reserve Target
(as it might have appeared in Blue
Book for November 19 meeting)

The expected levels and changes in nonborrowed reserves (NBR) are shown in the table below for the three policy alternatives, along with other related measures. Under alternative B--which assumes that money market conditions are about unchanged from those recently prevailing--NBR is indicated to increase about \$475 million, seasonally adjusted and bank borrowing is expected to remain about \$220 million below the average of the past four weeks. A more substantial increase in NBR is targeted under alternative A. Under alternative A, in view of the expected slightly further easing in the Federal funds rate, and assuming no change in the discount rate, member bank borrowing is expected to drop over the next four weeks to \$700 million on average. This drop in borrowing would offset about half of the expansion in nonborrowed reserves under alternative A, and total reserves are expected to show moderate growth over the period on average. The monetary base, which includes currency in circulation as well as total reserves, would be expected to show a larger increase, reflecting the steady expansion of currency.

Average Nonborrowed Reserves and Related Measures
(\$ million)

	<u>4 weeks ending November 20</u>	<u>4 weeks ending December 18</u>		
		<u>ALT. A</u>	<u>ALT. B</u> (Levels)	<u>ALT. C</u>
1. Nonborrowed reserves	35,635	36,290	36,105	35,935
2. Member bank borrowings	1,215	875	1,000	1,125
3. Total reserves (1+2)	36,850	37,165	37,105	37,060
4. Currency outside banks <u>1/</u>	69,330	69,765	69,765	69,765
5. Monetary base (3+4)	6,180	106,930	106,870	106,825
		<u>ALT. A</u>	<u>ALT. B</u> (Changes)	<u>ALT. C</u>
1. Nonborrowed reserves		655	470	300
2. Member bank borrowing		-340	-215	-90
3. Total reserves (1+2)		315	255	210
4. Currency outside banks <u>1/</u>		435	435	435
5. Monetary base (3+4)		750	690	645

1/ Currency outside member banks includes currency held in the vaults of nonmember banks.

Table Ia

ACTUAL ONE-MONTH PERCENTAGE CHANGE
at Annual Rates

	<u>M₁</u>	<u>M₂</u>	<u>Total Reserves</u>	<u>Non-borrowed Reserves</u>	<u>Source Base</u>	<u>Non-borrowed Source Base</u>	<u>RPD</u>	<u>RPD Less Reserves Against Large CDs</u>	<u>Non-borrowed RPD</u>	<u>Nonborrowed RPD Less Reserves Against Large CDs</u>
<u>1973</u>										
Jan.	4.7	9.4	30.1	26.8	11.3	10.0	15.9	14.3	11.8	9.7
Feb.	5.6	6.3	-21.1	-38.5	2.9	-2.5	-2.9	-9.0	-21.4	-29.6
Mar.	0.9	5.2	10.5	1.8	11.5	8.8	10.3	-0.6	1.0	-11.6
Apr.	6.0	8.3	14.7	20.1	8.5	10.0	10.0	-1.7	15.5	3.6
May	13.9	11.8	5.4	0.5	4.6	3.1	9.9	4.1	4.9	-1.9
June	14.2	12.8	0.5	0.2	7.1	7.2	17.3	14.0	18.1	14.6
July	4.1	5.7	27.2	24.9	7.3	6.2	18.5	14.2	15.4	10.5
Aug.	-0.5	6.5	-5.1	-13.5	0.3	-2.3	10.1	-1.9	2.0	-11.9
Sept.	-3.6	3.7	9.4	21.9	5.2	9.1	13.3	3.6	26.9	18.3
Oct.	5.0	11.0	12.1	26.7	9.6	14.3	1.0	7.5	15.8	25.0
Nov.	11.7	11.5	-4.3	-1.6	10.3	11.4	-6.3	4.7	-3.4	8.7
Dec.	9.8	10.2	10.5	14.4	9.5	10.8	9.4	14.6	13.4	19.6
<u>1974</u>										
Jan.	-3.5	6.3	35.7	45.9	8.9	11.9	6.9	-0.1	16.5	10.6
Feb.	11.1	12.7	-24.8	-30.4	6.6	5.0	-0.3	-7.0	-5.6	-13.2
Mar.	9.2	7.8	-5.4	-10.0	5.9	4.6	11.9	10.7	7.7	5.8
Apr.	6.5	7.2	32.7	19.0	13.5	8.9	19.7	6.8	4.6	-11.1
May	4.8	5.1	20.8	-8.2	6.5	-3.1	21.7	-0.2	-9.2	-37.5
June	7.8	10.6	6.8	-7.4	6.1	1.5	18.4	6.0	4.1	-12.2
July	1.7	5.4	22.5	14.1	5.2	2.0	8.7	3.8	-1.6	-9.2
Aug.	3.9	6.6	-5.4	-7.2	2.8	2.5	9.7	4.7	9.3	3.7

Table Ib

ACTUAL TWO-MONTH PERCENTAGE CHANGE
at Annual Rates

	<u>M₁</u>	<u>M₂</u>	<u>Total Reserves</u>	<u>Non-borrowed Reserves</u>	<u>Source Base</u>	<u>Non-borrowed Source Base</u>	<u>RPD</u>	<u>RPD Less Reserves Against Large CDs</u>	<u>Non-borrowed RPD</u>	<u>Nonborrowed RPD Less Reserves Against Large CDs</u>
<u>1973</u>										
Jan.	9.7	11.0	22.4	12.9	10.2	6.8	13.0	10.8	2.5	-0.6
Feb.	5.2	7.9	4.5	-5.9	7.1	3.7	6.5	2.6	-4.9	-9.9
Mar.	3.3	5.8	-5.3	-18.4	7.2	3.2	3.7	-4.9	-10.2	-20.6
Apr.	3.5	6.8	12.6	11.0	10.0	9.5	10.2	-1.2	8.2	-4.0
May	10.0	10.1	10.1	10.3	6.6	6.6	10.0	1.1	10.2	0.8
June	14.1	12.4	3.0	0.4	5.9	5.1	13.6	9.0	11.5	6.4
July	9.1	9.3	13.9	12.6	7.2	6.7	17.9	14.1	16.8	12.6
Aug.	1.8	6.1	11.1	5.7	3.8	2.0	14.3	6.2	8.7	-0.7
Sept.	-2.0	5.1	2.2	4.2	2.7	3.4	11.7	0.9	14.4	3.2
Oct.	0.7	7.4	10.8	24.3	7.4	11.8	7.2	5.6	21.3	21.6
Nov.	8.4	11.3	3.9	12.6	10.0	12.9	-2.7	6.1	6.2	16.8
Dec.	10.8	10.9	3.1	6.4	9.9	11.1	1.6	9.7	5.0	14.1
<u>1974</u>										
Jan.	3.1	8.2	23.3	30.4	9.2	11.4	8.2	7.3	15.1	15.2
Feb.	3.8	9.5	5.2	7.3	7.7	8.5	3.3	-3.5	5.5	-1.4
Mar.	10.2	10.3	-15.1	-20.1	6.2	4.8	5.8	1.8	1.0	-3.8
Apr.	7.9	7.5	13.6	4.4	9.7	6.7	15.9	8.7	6.2	-2.7
May	5.7	6.2	27.0	5.3	10.1	2.9	20.9	3.3	-2.3	-24.1
June	6.3	7.9	13.9	-7.7	6.4	-0.8	20.2	2.9	-2.5	-24.6
July	4.8	8.0	14.8	3.3	5.7	1.8	13.6	4.9	1.2	-10.6
Aug.	2.8	6.0	8.5	3.4	4.0	2.3	9.2	4.2	3.9	-2.8

Table II

Errors in Predicting Change in M_1
 Regression Equations: Within Sample Period
 (billions of dollars)

1973	Composite				Nonborrowed			
Date	Total Reserves	Source Base	RPD	RPD less CDs	Nonborrowed Reserves	Nonborrowed Source Base	Nonborrowed RPD	Nonborrowed RPD less CD
Jan.	-0.536	-0.920	-0.497	-0.587	-0.087	-0.549	-0.068	-0.009
Feb.	-0.761	-0.601	-0.615	-0.421	-0.343	-0.108	-0.307	-0.225
Mar.	-0.957	-0.925	-0.928	-0.624	-0.616	-0.494	-0.605	-0.442
Apr.	1.069	0.442	1.112	1.429	1.129	0.580	1.117	1.243
May	0.833	0.489	0.756	1.009	0.830	0.330	0.824	0.989
June	1.624	0.961	1.338	1.502	1.638	0.989	1.421	1.567
July	-0.174	-0.471	-0.354	-0.432	-0.174	-0.584	-0.267	-0.198
Aug.	-1.167	-1.073	-1.141	-0.911	-1.240	-1.128	-1.137	-0.917
Sept.	-0.489	-0.350	-0.611	-0.502	-0.720	-0.765	-0.734	-0.571
Oct.	0.040	-0.085	0.023	-0.132	-0.019	-0.288	-0.090	-0.171
Nov.	2.014	1.845	2.261	2.181	1.544	1.332	1.797	1.779
Dec.	1.280	0.947	1.485	1.430	1.173	0.778	1.369	1.301
Mean Absolute Error	.912	.759	.927	.930	.793	.660	.811	.784

Table III

Errors in Predicting Change in M_1
 Regression Equations: Outside Sample Period

(billions of dollars)

1974 Date	Composite				Nonborrowed			
	Total Reserves	Source Base	RPD	RPD Less CDs	Nonborrowed Reserves	Nonborrowed Source Base	Nonborrowed RPD	Nonborrowed RPD less CD
Jan.	-1.196	-1.897	-1.183	-1.414	-1.563	-2.310	-1.549	-1.735
Feb.	0.618	0.283	0.860	1.095	0.137	-0.197	0.302	0.367
Mar.	1.267	0.797	1.047	1.072	1.176	0.859	1.129	1.158
Apr.	0.744	-0.515	0.499	0.425	1.321	0.436	1.111	1.129
May	-1.956	-2.810	-2.010	-1.852	-1.054	-1.688	-1.141	-0.902
June	0.174	-0.261	0.215	0.510	1.219	0.760	1.204	1.481
July	-0.826	-1.075	-0.964	-0.884	0.031	-0.309	-0.117	-0.022
Aug.	-0.445	-0.624	-0.718	-0.456	-0.114	-0.302	-0.361	-0.171
Mean Absolute Error	.903	1.033	.937	.964	.827	.858	.864	.871

Table IV

Errors in Predicting Change in M_2
 Regression Equations: Inside Sample Period
 (billions of dollars)

Date	Composite				Nonborrowed			
	Total Reserves	Source Base	RPD	RPD less CDs	Nonborrowed Reserves	Nonborrowed Source Base	Nonborrowed RPD	Nonborrowed RPD less CD
1973								
Jan.	-0.700	-1.172	-.716	-0.550	0.754	-0.252	0.858	1.124
Feb.	-1.211	-0.828	-.861	-0.330	0.138	0.259	0.269	0.225
Mar.	-0.823	-0.643	-0.709	0.327	0.111	0.177	0.168	0.424
Apr.	0.784	-0.153	1.170	2.412	1.777	0.664	1.924	2.257
May	0.505	-0.905	0.193	1.235	0.800	-0.644	0.588	1.171
June	1.823	0.557	0.567	1.105	1.718	0.335	0.880	1.425
July	-1.560	-1.703	-2.237	-1.914	-1.700	-2.046	-1.976	-1.291
Aug.	-0.099	0.466	0.122	0.886	-0.488	-0.017	-0.081	0.745
Sept.	-1.099	-1.032	-1.672	-0.654	-0.881	-1.072	-1.270	-0.528
Oct.	0.862	0.956	0.503	0.452	0.498	0.483	0.291	0.495
Nov.	0.730	0.481	1.864	1.318	0.368	0.044	1.149	1.017
Dec.	3.428	2.239	4.103	3.516	2.178	1.212	2.732	2.493
Mean Absolute Error	1.135	.928	1.226	1.225	.951	.600	1.016	1.100

Table V

Errors in Predicting Change in M_2
 Regression Equations: Outside Sample Period
 (billions of dollars)

1974 Date	Composite				Nonborrowed			
	Total Reserves	Source Base	RPD	RPD Less CDs	Nonborrowed Reserves	Nonborrowed Source Base	Nonborrowed RPD	Nonborrowed RPD less CD
Jan.	0.760	-0.831	0.732	0.122	-0.141	-1.604	-0.110	-0.467
Feb.	2.659	1.684	3.601	3.929	1.830	0.997	2.379	2.408
Mar.	1.429	-0.263	1.146	1.159	1.452	0.042	1.168	0.920
Apr.	2.067	0.002	0.853	0.676	3.087	1.093	2.495	2.398
May	-4.172	-5.502	-4.378	-3.083	-0.939	-2.607	-0.970	-0.473
June	-0.770	-1.046	-0.899	0.708	2.666	1.519	2.542	3.096
July	-2.380	-2.192	-3.189	-2.152	0.160	-0.419	-0.485	-0.080
Aug.	-0.130	-0.443	-1.212	-0.051	0.883	0.344	0.064	0.721
Mean Absolute Error	1.796	1.495	2.001	1.485	1.326	1.078	1.277	1.319

Table VI

Average Errors in Predicting Change in M_1 Using Nonborrowed Reserves
 Regression Equation: Outside Sample Period

1974	Single Month	2-month Average	3-month Average	4-month Average	5-month Average	6-month Average	7-month Average
January	-1.563						
February	0.137	-0.713					
March	1.176	0.657	-0.083				
April	1.321	1.249	0.878	0.268			
May	-1.054	0.134	0.481	0.395	0.003		
June	1.219	0.083	0.495	0.666	0.560	0.206	
July	0.031	0.625	0.065	0.379	0.539	0.472	0.181
August	-0.114	-0.042	0.379	0.021	0.281	0.430	0.388

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