The Impact of CRR: Evidence and Analysis

The hypothesis that CRR should have had no impact on monetary control and federal funds rate volatility under borrowed reserve targeting is, in fact, supported by evidence drawn from the 1984 implementation experience. In terms of absolute average percent change, there was no significant difference in the weekly variability of either the M1 growth rate or the federal funds rate before and after CRR.

On the other hand, there was a significant reduction in federal funds rate variability observed following the 1982 shift in operating procedures, confirming that the switch to a borrowed reserve operating procedure had an important impact on reserve market dynamics. But these expectations have not been realized since the implementation of CRR because of changes made in the Federal Reserve’s operating procedures in late 1982.

The views expressed herein are those of the author and do not necessarily reflect the views of the Federal Reserve Bank of Cleveland. This Economic Commentary reviews the history of the LRR-CRR controversy and discusses the relative importance of reserve timing under various operating procedures. The purpose of this discussion is to explain why the expectations of CRR proponents have not yet been realized and to suggest how the Federal Reserve might make better use of the advantages offered by the new CRR arrangement.

Opponents of LRR suggested that a return to a CRR arrangement, similar to that which existed before 1968, would improve the efficiency of the Federal Reserve’s procedures by tightening the link between reserve supply and money stock growth, facilitating tighter monetary control. But these expectations have not been realized since the implementation of CRR because of changes made in the Federal Reserve’s operating procedures in late 1982.

Figure 1 The Timing of Lagged and Contemporaneous Reserve Accounting

Criticism of the LRR system surfaced soon after it was implemented in 1968, but became more intense after the Federal Reserve adopted a reserve-oriented monetary control strategy in October 1979. The early criticism of LRR focused on the observed increase in federal funds market volatility after 1968. But after the 1979 change in operating procedures, the focus of criticism involved the problems that CRR proponents have not yet been realized and to suggest how the Federal Reserve might make better use of the advantages offered by the new CRR arrangement.


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But despite the increased intra-weekly reserve market instability, LRR caused no serious problems for the implementation of monetary policy at the time. Throughout most of the 1970s, the Federal Reserve System used an operating procedure that involved selecting a narrow range for the federal funds rate that was expected to be consistent with targeted money stock growth. The System then supplied and absorbed reserves to keep the short-term federal funds rate within that band. Under this procedure the Federal Reserve accommodated short-term fluctuations in demand, so it did not matter if those fluctuations originated from deposit growth changes in the current week or from two weeks earlier.

### The October 1979 Operating Procedures: New Considerations

By the end of the 1970s, it was widely recognized that the federal funds rate operating procedure was not well-suited to short-term monetary control. Nontransitory deviations of money from target were difficult to identify, and when identified, the Reserve was reluctant to commit itself to a change in the funds rate that might be with a quicker response. Therefore, it was argued that the variability of money supply growth, and possibly the volatility of interest rates as well, would be lower with CRR than with LRR under a nonborrowed reserves operating procedure. Other critics of LRR suggested that a total reserve operating procedure might be more effective for monetary control than the nonborrowed reserves technique, and that the adoption of CRR was a necessary prerequisite to the implementation of a monetary control approach.

Proponents of a total reserve (or total monetary base) operating procedure argued that the nonborrowed reserve procedure suffered from two important flaws. First, because increases in reserve demand were accommodated through discount-window borrowing, the banking mechanism for the Federal Reserve's above-path deposit expansion and meet reserve requirements through borrowing. In addition, the relationship between changes in discount-window borrowing and federal funds rate movements is far from exact. Thus, total reserve advocates have argued that the role of borrowed reserves under the nonborrowed reserve operating procedure resulted in an element of instability on the behavior of the narrow monetary aggregate M1 as it had in the past.

When the Federal Reserve announced that it was replacing the Federal Reserve's monetary control advantages that the borrowed reserve operating procedure had from deposit flows. Under CRR, a change in the money market stability, member banks, and a partial offsetting change in required reserves. But under LRR, the change in deposits and actual reserves did not give rise to an offsetting change in required reserves until two weeks later. Thus, the reserve adjustment necessary in the current week became larger, and reserve adjustment became necessary to offset deviations of money from target.

This need for greater reserve adjustment, combined with the tendency of banks to delay adjustments until near the end of the reserve accounting period, caused greater fluctuations in demand under CRR. These fluctuations required either more end-of-week federal funds rate variability or more active manipulation of reserve supplies by the Federal Reserve to smooth interest rate movements toward the end of a week. In fact, after the implementation of LRR in 1968, increases in end-of-week variability were found to exist both for the federal funds rate and for the volume of Federal Reserve defensive open-market operations.

### The Adoption of CRR and the 1982 Operating Procedures

In implementing the Federal Reserve System's Board of Governors voted to implement a form of CRR, noting that the monetary control advantages that it offered:

It is expected that contemporaneous reserve requirements will improve the implementation of monetary policy to a degree by strengthening the linkage between reserves held by depository institutions and the money supply. (Federal Reserve Press Release, October 5, 1982, p. 1.)

While noting that the relationship between money and reserves would still be subject to a degree of uncertainty, the Board's statement was an encouraging indication of reserve-oriented operat- ing procedures were to be improved by the change.

But in the same month that the Board announced the details and the Federal Open Market Committee (FOMC) announced that it was implementing the new rules on the behavior of the narrow monetary aggregate M1 as it had in the past.

Financial deregulation had resulted in the expansion of the Federal Reserve's money supply target to include many types of deposit accounts, and as the public began to take advantage of these accounts, the monetary aggregates (M1 in particular) became subject to large deviations from their typical growth patterns.

Reducing emphasis on M1 implied that the potential impact of CRR was of less value. The CRR plan adopted by the Board was particularly suited to improve control over M1 rather than over the broader aggregates, because only reserves on demand deposits and other checkable deposits were moved to a contemporaneous basis. Other reserve requirements were left to be set on a lagged basis.

More importantly, the impact of CRR was more likely with changes in other operating procedures in late 1982. Shortly after weight given to M1 was reduced, it became apparent that all of the aggregates would behave uncharacteristically for a time, so that monetary policy would have to be conducted in a more judgmental manner than it had since 1979. Therefore, the FOMC revised the 1979 operating procedures to allow a "flexible" nonborrowed reserve path.

This strategy essentially amounted to setting an objective for borrowed reserves in order to achieve a "degree of reserve restraint" rather than aiming toward specific behavior of nonborrowed or total reserves.

The new procedures called for a target for borrowed reserves, the FOMC is following a policy that tends to smooth interest rate movements. Because of administrative regulation of discount-window bor--rowing, and many banks' general reluctance to borrow from the Federal Reserve, there is a connection between the volume of borrowing and the spread between the federal funds rate and discount rates. A larger spread between these rates is required to induce banks to borrow at the discount window rather than pay the higher price in the federal funds market.

The relationship is not exact, the Federal Reserve's maintenance of a borrowing target does tend to con-fine federal funds rate movements, so that the borrowed reserve operating procedure is somewhat reminiscent of the pre-1979 federal funds rate regime. Because this procedure provides no automatic mechanism to respond to unexpected monetary deviations, the timing of reserve demand responses to monetary growth variations is longer a practical consideration; money demand fluctuations are being accommodated with total reserves adjusting to demand in the short-run.
But despite the increased intra-weekly reserve market instability, LRR caused no serious problems for the implementation of monetary policy at the time. Throughout most of the 1970s, the Federal Reserve System used an operating procedure that involved selecting a narrow range for the federal funds rate that was expected to be consistent with targeted money stock growth. The System then supplied and absorbed reserves to keep the funds rate within that band. Under this procedure the Federal Reserve accommodated short-lived fluctuations in the demand for reserves, so it did not matter if those fluctuations originated from deposit growth changes in the current week or from two weeks earlier.

The October 1979 Operating Procedures: New Considerations

By the end of the 1970s, it was widely recognized that the federal funds rate operating procedure was not well-suited to short-term monetary control. Nontransitory deviations of money from target were difficult to identify, and when the Federal Reserve finally recognized them, it was difficult to decide on an appropriate funds rate movement in response. In October 1979, the Federal Reserve announced that it was replacing the funds rate operating procedure with a nonborrowed reserve control strategy. The intermediate target of monetary policy—the growth rate of monetary aggregates—was unchanged; the new procedure was intended to make monetary targeting more precise by providing a mechanism in which the federal funds rate would adjust automatically to reflect, and eventually to counteract, unexpected changes in money growth.

The new procedures called for supplying reserves to maintain a growth path for nonborrowed reserves, allowing the Federal Reserve to be met only through discount-window borrowing. Because banks are generally reluctant to borrow from the Federal Reserve, increases in reserve demand are linked with federal funds rate increases as banks bid more vigorously in the funds market than in the discount market. Thus, the Federal Reserve borrowing procedures provided a mechanism by which money growth excesses were automatically met by federal funds rate movements in the appropriate direction. Although the new procedures involved a reduction in the Federal Reserve's reaction to monetary growth movements, the existence of LRR delayed funds rate adjustments by causing deviations of money from target to be accommodated until reserve demand was met. To the extent that the delay was nontransitory, the delay allowed it to accumulate over time so that the federal funds rate response necessary to bring the quantity of money back onto target was larger than it might be with a quicker response. It was argued that the variability of money supply growth and the possibility of interest rate volatility were lower with LRR because without a discount window, banks needing reserves sought to bid them away from banks with excess reserves, any change in excess demand or excess supply in the reserve market would generate wide swings in the federal funds rate. The more contemporaneous reserve requirements are, the more smoothly federal funds rate adjustments are likely to be under a total reserve operating procedure.

The Adoption of CRR and the 1982 Operating Procedures

In January 1982, the Federal Reserve System's Board of Governors voted to implement a form of CRR, noting that the monetary control advantages that it offered: It is expected that contemporaneous reserve requirements will improve the implementation of monetary policy to a degree by strengthening the linkage between reserves held by depository institutions and the money supply. (Federal Reserve Press Release, October 5, 1982, p. 1.)

While noting that the relationship between money and reserves would still be subject to a degree of uncertainty, the Board's statement was an encouraging indication of a reserve-oriented operating procedure were to be improved by the change.

But in the same month that the Board announced the decision to move to CRR, the Federal Open Market Committee (FOMC) announced that it would implement CRR on a temporary basis for the behavior of the narrow money aggregate M1 as it had in the past. Financial deregulation had resulted in the proliferation of new types of deposit accounts, and as the public began to take advantage of these accounts, the monetary aggregates (M1 in particular) became subject to large deviations from their typical growth patterns.

Reducing emphasis on M1 implied that the potential impact of CRR was of less value. The CRR plan adopted by the Board was particularly suited to improve control over M1 rather than over the broader aggregates, because only reserves on demand deposits and other checkable deposits were moved to a contemporaneous basis. Other reserve requirements were left to be met on a lagged basis. More importantly, the impact of CRR was negligible under a change in operating procedures in late 1982. Shortly after weight given to M1 was reduced, it became apparent that all of the aggregate would behave uncharacteristically for a time, so that monetary policy would have to be conducted in a more judgmental manner than it had since 1979. Therefore, the FOMC revised the 1979 operating procedures to allow a "flexible" nonborrowed reserve path. This strategy essentially amounted to setting an objective for borrowed reserves in order to achieve a "degree of reserve restraint" rather than the targeting toward specific behavior of nonborrowed or total reserves.

Therefore, the nonborrowed reserve target for borrowed reserves, the FOMC is following a policy that tends to smooth interest rate movements. Because of administrative regulation of discount-window borrowing, and many banks' general reluctance to borrow from the Federal Reserve, there is a connection between the volume of borrowing and the spread between the federal funds and discount rates. A larger spread between these rates is required in order to induce banks to borrow at the discount window rather than pay the higher price in the federal funds market.

The relationship is not exact, the Federal Reserve's maintenance of a borrowing target does tend to confine federal funds rate movements, so that the borrowed reserve operating procedure is somewhat reminiscent of the pre-1979 federal funds rate regime. Because this procedure provides no automatic mechanism to respond to unexpected monetary deviations, the timing of reserve demand responses to monetary growth variations is likely to be a practical consideration; money demand fluctuations are being accommodated with total reserves adjusting to demand in the short-run.


9. A description of the borrowed reserve operating procedure is contained in Henry C. Walsh, "Recent Techniques in Monetary Policy" (reprint from the Midwest Finance Association, April 5, 1984).
The Impact of CRR: Evidence and Analysis

The hypothesis that CRR should have had no impact on monetary control and federal funds rate volatility under borrowed reserve targeting is, in fact, supported by evidence drawn from the 1984 implementation experience. \(^5\) In terms of absolute average percent change, there was no significant difference in the weekly variability of either the M1 growth rate or the federal funds rate during the pre-CRR and post-CRR sample periods.

On the other hand, there was a significant reduction in funds rate variability observed following the 1982 shift in operating procedures, confirming that the switch to a borrowed reserve operating procedure had an important impact on reserve market dynamics.

It has been suggested that the failure of CRR to dampen money and interest rate variability might be attributed either to the change in operating procedures or to the failure of CRR to alter the reserve management practices of banks. \(^5\) But these two explanations are actually the same. In managing their reserves, banks do not react to the volume of reserves available, nor can they even be fully aware of those available—except through some market signal, the most important of which is provided by the federal funds rate.

To the extent that the federal funds rate is stabilized by the Federal Reserve's operating procedures, the banking system will not be induced to make timely reserve adjustments in response to deviations of money from target. The advantage of a nonborrowed reserve control operating procedure under CRR is that it can allow automatic offsetting movements in interest rates in response to short-run deviations of monetary growth from target, thus providing banks with the necessary signal to make timely adjustments.

However, under the current borrowed reserves operating procedure, the Federal Reserve manipulates the supply of nonborrowed reserves to accommodate unexpected demand changes so that the level of borrowing is maintained. Consequently, automatic funds rate movements in response to money shocks do not materialize, and the reaction of the federal funds rate to monetary deviations is largely dependent on discretionary adjustment of the borrowing target by the FOMC.

Conclusion: The Outlook

CRR is important not because it has improved the Federal Reserve's short-term monetary control, but because it makes possible a wider range of operating procedure choices in the future that may improve that control. Whether the potential of CRR is ever fully realized depends upon whether the Federal Reserve returns to a reserve-oriented operating procedure.

A return to nonborrowed reserve operating procedures would include a role for CRR in speeding up the automatic funds rate response to monetary shocks as compared with the experience of 1979-82. Moreover, CRR would be an important element of a total reserve operating procedure. As long as policy is conducted as it is now, however, the advantages of CRR will be unrealized.

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