The Impact of New Economic Information on the Volatility Of Short-Term Interest Rates

By V. Vance Roley and Rick Troll

The sharp rise in the volatility of interest rates since late 1979 is widely recognized. One factor contributing to the increase in volatility may have been the Federal Reserve's change in its monetary-control procedures on October 6, 1979. Until then, the Federal Reserve focused on the control of short-term interest rates in an effort to achieve monetary growth objectives. Since late 1979, however, it has focused on the availability of reserves to financial institutions.[1] As a consequence, short-term interest rates have been allowed to vary over a wider range than they were before. It is not surprising, then, that short-run movements in interest rates have been more pronounced.

A previous article in this *Review* examined the effect of the change in the Federal Reserve's operating procedures on interest-rate volatility.[2] That article focused on the increase since October 1979 in fluctuations in interest rates following weekly announcements of changes in the money supply. These announcements, which are made by the Federal Reserve every Friday, provide new information about money supply developments that participants in financial markets use in adjusting their assessments of the current availability of reserves, the future course of monetary policy, and possibly inflation. For example, the announcement of a larger than anticipated change in the money supply may lead market participants to expect a change in the Federal Reserve's monetary policy that will affect interest rates. In anticipating the change in policy, market participants may then take actions that lead immediately to movements in interest rates.

The previous article found that the change in operating procedures had contributed to the rise in interest-rate volatility because the change

1 For descriptions of the operating procedures adopted by the Federal Reserve on October 6, 1979 and comparisons with the previous approach, see J. A. Cacy, "Monetary Policy in 1980 and 1981," *Economic Review,* Federal Reserve Bank of Kansas City, December 1980, pp. 18-25, and Board of Governors of the Federal Reserve System, "Monetary Policy Objectives for 1981," February 1981.

2 V. Vance Roley, "Weekly Money Supply Announcements and the Volatility of Short-Term Interest Rates," *Economic Review,* Federal Reserve Bank of Kansas City, April 1982, pp. 3-15. For a more technical analysis, see V. Vance Roley, "The Response of Short-Term Interest Rates to Weekly Money Announcements," Working Paper No. 1001, National Bureau of Economic Research, October 1982.

V. Vance Roley is an assistant vice president and economist in the Economic Research Department at the Federal Reserve Bank of Kansas City. Rick Troll is an assistant economist.

encouraged market participants to respond more to a given money supply announcement. This article extends the previous analysis by examining the impact on interest-rate volatility of factors in addition to money supply announcements, such as new information on economic performance and announcements of changes in the Federal Reserve's discount rate. Also, in contrast to the previous study, which focused on interest-rate volatility immediately after money supply announcements, this article examines the impact on total interest-rate volatility.

The first section discusses alternative theories relating to the effects of new economic information on short-term interest rates. The volatility of announced changes in money, inflation, and economic activity, and the associated interest-rate volatility before and after October 1979, are discussed in the second section. The third section empirically examines the relationship between announced changes in money, inflation, and economic activity and fluctuations in interest rates to determine if increases in the responses to these announcements have significantly contributed to the rise in total interest-rate volatility. The main conclusions of the article are summarized in the final section.

THEORETICAL CONSIDERATIONS OF ECONOMIC INFORMATION AND INTEREST RATES

In discussing theories about the relationship between interest rate movements and new economic information, this section first reviews the usual rationale for the positive relationship between interest rates and unanticipated announced changes in the money supply found in other studies. Then, the effect of announced changes in the discount rate on short-term interest rates is considered. Finally, the possible effects of data announcements concerning inflation and economic activity are discussed.

Money supply announcements

Announcements of larger than anticipated increases in the money supply have been observed to result in increases in short-term interest rates. The most frequent explanation of this positive relationship is based on the notion that the change reflects market participants' anticipations of both current and future Federal Reserve actions.[3] Because market yields already reflect expectations of future announced changes in money, and hence the future course of Federal Reserve actions, only unanticipated changes in the money supply should affect interest rates after a money supply announcement. If the announced money supply is greater than anticipated, for example, market participants may expect higher short-term interest rates if they believe the Federal Reserve will attempt to offset the increase by reducing the growth of bank reserves. Because of this changed assessment, market participants' actions will cause interest rates to increase immediately.

Even if market participants do not expect the growth of bank reserves to slow in response to an unanticipated increase in the money supply, short-term interest rates may nevertheless rise under a reserve-aggregate approach to monetary control. Because of the lagged reserve accounting framework the Federal Reserve uses

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3 Jacob Grossman, "The Rationality of Money Supply Expectations and the Short-Run Response of Interest Rates to Monetary Surprises," *Journal of Money, Credit, and Banking,* November 1981, pp. 409-24; Thomas Urich and Paul Wachtel, "Market Response to the Weekly Money Supply Announcement in the 1970s," *Journal of Finance,* December 1981, pp. 1063-72; and Thomas Urich, "The Information Content of Weekly Money Supply Announcements," *Journal of Monetary Economics,* July 1982, pp. 73-88. For an alternative view stressing the role of expected inflation, see Bradford Cornell, "Money Supply Announcements and Interest Rates: Another View," Working Paper No. 1-82, Graduate School of Management, University of California at Los Angeles, March 1982.

in imposing reserve requirements, the current demand for reserves depends on deposits in the statement week ending on Wednesday of the previous week. Thus, announcement of a higher than expected change in the money supply may cause investors to increase their assessment of the aggregate demand for reserves. In turn, if investors expect the supply of reserves to remain unchanged for the rest of the current statement week, short-term interest rates will be expected to rise to equilibrate supply and demand in the reserve market.[4]

Discount rate announcements

Another announcement related to Federal Reserve policy involves changes in the discount rate. Under the pre-October 1979 operating procedures, discount rate changes typically lagged behind market yields. Moreover, the federal funds rate—which the Federal Reserve influenced in implementing monetary policy—conveyed more timely signals about the current interest-rate implications of monetary policy.

In principle, the discount rate becomes more important in implementing monetary policy under the reserve-aggregate approach to monetary control adopted in October 1979.[5] Changes in the discount rate may have an immediate effect on short-term interest rates. This is because the incentive for depository institutions to meet their reserve needs at the discount window depends importantly on the spread between the federal funds rate and the discount rate. Under the lagged reserve accounting system, depository institutions' demand for reserves in the current week is essentially fixed. The Federal Reserve then determines the mix between reserves supplied through open market operations—nonborrowed reserves—and reserves supplied through the discount window. To the extent that the Federal Reserve maintains its nonborrowed reserve objective, an increase in the discount rate initially creates a disincentive for depository institutions to borrow at the discount window. Since the supply of nonborrowed reserves is fixed, depository institutions seeking to meet their reserve needs in the federal funds ,market drive the funds rate up. Under these circumstances, the funds rate and other short-term interest rates move with a change in the discount rate.

Inflation announcements

At least three channels may link announcements of inflation data, such as changes in the consumer (CPI) and producer (PPI) indexes, to movements on short-term interest rates. First, if the indexes are higher than anticipated, market participants may revise their assessments of current inflation upward and lenders, in turn, may demand an increased inflation premium to restore the real, or inflation adjusted, return on loans to previous rates. Thus, any rise in expected inflation may cause nominal interest rates to rise.[6]

Second, if the announced inflation level

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4 Carl E. Walsh, "The Effects of Alternative Operating Procedures on Economic and Financial Relationships," Research Working Paper No. 82-08, Federal Reserve Bank of Kansas City, September 1982.

5 See, for example, Gordon H. Sellon, Jr., "The Role of the Discount Rate in Monetary Policy: A Theoretical Analysis," *Economic Review,* Federal Reserve Bank of Kansas City, June 1980, pp. 3-15; and Gordon H. Sellon, Jr., and Diane Seibert, "The Discount Rate: Experience Under Reserve Targeting," *Economic Review,* Federal Reserve Bank of Kansas City, September/October 1982, pp. 3-18.

6 For further discussion of this effect, see Thomas Urich and Paul Wachtel, "The Effects of Inflation and Money Supply Announcements on Interest Rates," mimeo, Graduate School of Business Administration, New York University, August 1982.

causes a reassessment of current and future inflation, market participants may also revise their assessments of the current and future demand for money. This result may follow because the demand for nominal money balances depends on the price level.[7] In turn, under the reserve-aggregate approach to monetary control, any change in the forecast of money demand has immediate implications for interest rates. For example, an increase in the expected demand for nominal money balances due to higher expected inflation may cause market participants to increase their assessments of the future demand for bank reserves. Interest rates may then rise to equilibrate the demand for and supply of reserves. Under the pre-October **1979** operating procedures, short-run fluctuations in money demand were typically at least partially offset, implying that unanticipated announced changes in inflation should have been associated with somewhat more moderate short-run movements in interest rates.

Third, if market participants think the Federal Reserve responds directly to inflation, there may be another channel in which interest rates respond to unanticipated announced changes in inflation. If the Federal Reserve reacts to price data as well as money supply data, unanticipated changes in inflation could be associated with movements in short-term interest rates. This channel would appear to have been potentially more prevalent under the pre-October **1979** policy regime, since the emphasis on monetary control appeared to be somewhat less than in the three years since.

Economic activity announcements

Unanticipated announced changes in economic activity, such as announcements of the unemployment rate and industrial production, may have both indirect and direct effects on interest rates. In terms of a possible indirect effect, announcements that cause investors to reassess the current and future strength of the economy may, in turn, cause market participants to revise their assessment of the current and future demand for money, as money demand is thought to vary positively with real income. Unanticipated increases in real activity may be associated with higher interest rates, then, if investors increase their assessments of the future demand for bank reserves. As before, this effect could be more prevalent under the reserve-aggregate approach to monetary control.

Directly, interest rates may change in response to unanticipated announced changes in economic activity if market participants think the Federal Reserve reacts to such announced changes. If Federal Reserve policy changes in response to new information not only about the money supply but also about economic activity, interest rates may move immediately on release of the new information. Again, this channel appears more plausible under the pre-October **1979** policy regime.

Effects of the change in operating procedures

In the previous study, the October **1979** change in operating procedures was found to coincide with a sharp increase in the responsiveness of short-term interest rates to unanticipated announced changes in the money supply. In terms of announcements concerning discount rate changes, inflation, and economic activity, only changes in the discount rate should have had unambiguously larger effects since October **1979.** If market participants use new information about inflation and economic activity to infer changes in the demand for money and hence the demand for bank reserves and

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7 See, for example, Stephen M. Goldfeld, "The Demand for Money Revisited," *Brookings Papers on Economic Activity,* No. 3, 1973, pp. 577-638.