that the relationship grew less exact, and the responsiveness of borrowing to the rate spread apparently declined. These changes were probably a result of increased uncertainty about Federal Reserve policy and about future Federal funds discount rate spreads. Banks tend to be more cautious about using their discount-window privileges (resulting in the flatter slope) and are more prone to error (resulting in increased variability), the less certain they are about future rate spreads.

When monetary policy procedures were modified in 1982, insulating the Federal funds rate and borrowing from the vagaries of weekly money supply growth, the reliability in the borrowing relationship increased, and borrowing became more responsive to changes in the rate spread. Yet, while chart 4c clearly shows this, it also reveals that the relationship was nonetheless flatter and more scattered between 1982 to 1985 than it was between 1975 and 1979. A number of factors may account for this. First, the Federal funds discount rate spread remained more volatile than it was during the 1975 to 1979 period. Second, there may have been some lingering uncertainty from previous operating procedures. The shift in procedures in late 1982 was gradual, and banks were slow to realize how Federal Reserve operations were being conducted. Finally, even though current procedures tend to smooth the Federal funds rate, they nevertheless retain the structure of the 1979 to 1982 procedures (that is, biweekly nonborrowed reserve objectives are sought that force target amounts of borrowing into the discount window). The Federal funds rate is freer to move with market forces than under Federal funds targeting, leading to greater uncertainty about future rate spreads.

Summary

In the clean world of textbook models, individual banks' demand functions for borrowed reserves result in an upward sloping reserve supply relation, commonly referred to as the borrowing function. This can be used by the Federal Reserve in its attempt to successfully implement monetary policy. Observation, however, reveals that the relationship is, by no means, exact. It has often been volatile, and both the volatility and slope of the relationship appear to have changed from time to time, particularly with respect to different operating procedures. How much these factors affect the outcome of monetary policy is a matter of debate.

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ECONOMIC COMMENTARY

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November 1, 1985

Reserve Borrowings and the Money Market

by Richard L. Mugel

One of the functions of the Federal Reserve System is to provide loans to depository institutions (generally, banks) in each district through what is figuratively known as the "discount window." These loans help banks to overcome temporary liquidity problems, to adjust their investment portfolios to sudden changes, and to handle emergency situations when other sources of credit are unavailable.

The discount window also plays an important role, however, as a monetary policy instrument. In this capacity, monetary policymakers rely on a systematic relationship observed between the volume of borrowing at the discount window and the difference (spread) between the federal funds rate and the discount rate. The Federal Reserve is the rate charged for loans in the interbank market for bank reserves, whereas the discount rate is the rate charged for borrowing reserves at Federal Reserve Banks. In general, greater or lesser amounts of borrowing tend to be associated with wider or narrower spreads between the federal funds rate and the discount rate.

In this Economic Commentary, we explore how borrowing and the spread interact, review the monetary policy role of the discount window, and discuss some changes in this relationship that have taken place in recent years.

The Anatomy of Borrowing

Federal Reserve loans fall into three categories. Loans that allow depositories to adjust their portfolios to unanticipated deposit and loan activity are called adjustment credit. Seasonal credit loans allow certain institutions (farm banks, for example) to take advantage of a favorable spread between the discount rate and other rates on sources of funds, or for supporting the rate spread and interest rate activity. In addition, the Federal Reserve sets guidelines pertaining to the appropriate amount, frequency, and duration of discount-window borrowing for banks of different size. Finally, even though some regulations, relevant observation reveals that the volume of adjustment and seasonal borrowing at the discount window is quite sensitive to movements in money market interest rates, suggesting that depositors, as a matter of policy, consider the Federal Reserve favorable rate spreads in their borrowing decisions. A positive relationship between borrowing and the spread of the funds rate over the discount rate is not by itself at odds with discount-window guidelines. It is, in fact, perfectly consistent with the behavior predicted by economic theory.

Table 1 Discount Window Administrative Numerical Guidelines

<table>
<thead>
<tr>
<th>Size of bank (domestic deposits)</th>
<th>Consecutive weeks of borrowing</th>
<th>Weeks of borrowing within:</th>
<th>Borrowing as a percent of domestic deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $200 million</td>
<td>4-5</td>
<td>6-7</td>
<td>7-8</td>
</tr>
<tr>
<td>$200 million - $1 billion</td>
<td>3-4</td>
<td>5-6</td>
<td>7-8, 2</td>
</tr>
<tr>
<td>$1 billion - $3 billion</td>
<td>2-3</td>
<td>4-5</td>
<td>6-7, 1.5</td>
</tr>
<tr>
<td>More than $3 billion</td>
<td>1-2</td>
<td>3-4</td>
<td>4-5, 1.0</td>
</tr>
</tbody>
</table>


1. Because of the special circumstances under which it is typically issued, the volume of extended credit borrowing tends to be relatively insensitive to changes in short-term interest rates and, therefore, excluded from most expressions of the borrowing function.

2. For more information on Regulation A and discount window guidelines, see The Federal Reserve Discount Window, Board of Governors of the Federal Reserve System, October 1980.
Understanding the Borrowing Relationship

Traditionally, economists have advanced two theories to explain banks' behavior at the discount window: the profit theory and the need theory. According to the profit theory, depository institutions borrow at the discount window, and repay those loans, whenever it is profitable. The need theory states that institutions are naturally reluctant to increase their indebtedness at Federal Reserve Banks and will borrow only when they have to.

Neither of these hypotheses, however, offers a complete explanation. Taken together, both the need and the profit theories of borrowing are able to explain the discount-window behavior of depository institutions and to account for the observed relationship between borrowing at the discount window and the spread between the federal funds rate and the discount rate. The most common approach to understanding the borrowing relationship begins with the standard microeconomic assumption that banks seek to maximize their profits. Consequently, they make calculated decisions weighing the perceived costs of a particular activity against its expected benefits.

The discount window, however, does not adequately depict the actual cost of discount-window borrowing. Depositories also have to consider the opportunity cost of borrowing. Federal Reserve regulations limit the use of discount-window credit and limit the volume, frequency, and duration of borrowing. By applying for a discount-window loan today, they reduce their ability to borrow, unless a favorable gap between the federal funds rate and the discount rate presents itself.

As a consequence, banks must consider past borrowing, future rate spreads and expected future needs in their current discount-window decisions. This can be understood by means of the following analogy: imagine a bank that has a limited number of tickets to the discount window for use during a specified period. Since it can't predict its future need to borrow, the bank will conserve its tickets, using them when it is to its greatest advantage. This approach is consistent with the profit theory of borrowing.

In addition to opportunity cost, there are other considerations that encourage banks to seek alternative funding before turning to the discount window. A bank may be reluctant, for example, to risk facing reprisals from Federal Reserve discount-window officers should its reason for borrowing be considered inappropriate. Inappropriate and excessive loan requests may jeopardize future access to the window and invite greater scrutiny from federal regulators. Banks also may wish to avoid borrowing at the discount window because, were it to become known in the market, it might be interpreted as a sign of weakness that would increase the costs of borrowing in the market. Even though the names of borrowing institutions are not disclosed by Federal Reserve Banks, banks nevertheless fear discovery. Because of these risks, depositories generally try to avoid borrowing at the discount window. As a result, they are willing to pay a higher price for money from alternative sources and, before borrowing, will search out these alternatives first. Significantly higher premiums in the marketplace, however, induce banks to overcome their reluctance to borrow from the System; guided by the profit motive, they will come to the discount window.

The theoretical foundation upon which the borrowing function rests, therefore, is the microeconomic behavior of individual banks. Considering all costs—explicit and implicit—in their decision to borrow, banks seek to maximize profits. The result is a positive relationship between the volume of borrowing at the discount window and the federal funds-discount rate spread. This relationship can be exploited by the Federal Reserve in its conduct of monetary policy. By regulating the supply of nonborrowed reserves, the System is able to determine reserve market pressures and to influence the aggregate level of borrowing.

The Borrowing Relationship and Monetary Policy

Federal Reserve policymakers seek to foster conditions that are expected to promote price stability and economic growth. The System uses bank reserves as a tool, controlling at any one time either the quantity of reserves or their price (the federal funds rate). Prior to 1979, the Federal Reserve placed greater emphasis on reserves and, from 1975 on, on the discount rate that were thought to be consistent with desired money supply growth. The relationship between borrowing at the discount window and the federal funds rate took on a more important role after October 1979, when the Federal Reserve sought to gain better control over money supply growth by focusing more closely on the quantity of bank reserves in its operating strategy. Despite changes in procedures and strategies since 1979, the importance of the borrowing relationship to monetary policy has persisted.

While there might appear to be a simple and precise relationship between borrowing and the rate spread, this is not really the case. Under nonborrowed reserves targeting, deviations in reserve demand and seasonal borrowing are likely to produce a degree of reserve pressure, allowing nonborrowed reserves to vary with changes in reserve demand. Unlike nonborrowed reserves targeting, deviations in reserve demand from reserve supply, as a rule, are met through open-market operations, not seasonal borrowing. Seasonal borrowing automatically leads to higher levels of borrowing and tighter reserve market conditions. This approach to interweek variations in reserve demand, has tended to moderate the intensity of fluctuations in the federal funds rate.

Several factors may explain the short-run variability in the borrowing-spread relationship. Some are predictable and can be modeled. These include market pressures and seasonal events, such as periods of holidays, tax dates, and quarters. The other category includes chance factors, such as wire transfer failures, deposit and loan fluctuations, random fluctuations in large customers' activity cost of borrowing. Federal Reserve policymakers seek to moderate the intensity of fluctuations in the federal funds rate.

A closer look at the borrowing relationship reveals notable changes in the slope and reliability of the borrowing relationship over time, particularly with respect to different Federal Reserve operating procedures. The slope of the borrowing relationship indicates the responsiveness of borrowing to the federal funds-discount rate spread. Steeper slopes indicate greater responsiveness of the Federal Reserve to changes in the spread. Estimation of the spread relationship reveals noticeable changes in the spread relationship reveals noticeable changes in the spread relationship.

In late 1982, procedures guiding open-market operations were modified because the usefulness of M1 as a guide for monetary policy operations diminished as the introduction of new deposit instruments altered the relationship between M1 and economic activity. Under the newer procedure, known as borrowed reserves targeting, the System sought to influence the quantity of seasonal adjustments and seasonal borrowing that are expected to produce a degree of reserve pressure, allowing nonborrowed reserves to vary with changes in reserve demand. Unlike nonborrowed reserves targeting, deviations in reserve demand from reserve supply, as a rule, are met through open-market operations, not seasonal borrowing. Seasonal borrowing automatically leads to higher levels of borrowing and tighter reserve market conditions. This approach to interweek variations in reserve demand, has tended to moderate the intensity of fluctuations in the federal funds rate.

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