Is the Fed Being Swept Out of (Monetary) Control?

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What has your bank done for you lately? One task your bank has probably carried out is settling checks you've written and payments you've made with your debit card. Settling transactions is an important function of banks. Most of us would be upset if we received a notice from a bank informing us that it is temporarily out of funds and must wait before it pays the recipients of checks we've written. However, we are spared this upset because banks hold reserves to guard against such events. But settling payments isn't the only reason banks hold reserves: they're required to do so by law.

For many banks, required reserves have been larger than what they needed to settle payments. And because the Federal Reserve cannot, by law, pay interest on reserves, banks can't earn money on them. In response, banks have set up "sweep accounts": a bank "sweeps" funds out of traditional checking accounts, which are subject to reserve requirements, and into money market deposit accounts, which are exempt from reserve requirements.[1]

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[1]In this article, the word bank refers to depository institutions required to hold reserves. These institutions, according to the Monetary Control Act of 1980, include commercial banks, mutual savings banks, savings and loan associations, credit unions, agencies and branches of foreign banks, and Edge Act corporations.

Although sweep accounts benefit banks by reducing the amount of non-interest-bearing reserves they have to hold, such accounts complicate the Federal Reserve's job of implementing monetary policy. As sweep accounts reduce reserves toward the levels needed solely to settle payments, banks more often scramble to borrow and lend reserves, also called federal funds, in response to unforeseen deficiencies and surpluses. As a result, the federal funds rate—the short-term interest rate at which banks borrow and lend reserves among themselves—could become more and more volatile.

In this article, we will consider what effects sweep accounts have had on the market for bank reserves and on the Federal Reserve's job of managing reserves in the banking system.[2] We'll also look at a recent change the Federal Reserve has made to prevent interest rate volatility from increasing as use of sweep accounts continues to spread.

WHAT ARE RESERVES, AND WHY DO BANKS HOLD THEM?

A bank's reserve balance is simply an amount that it holds as cash in its vault or on deposit at the Federal Reserve. Currently, depository institutions in the United States are legally required to hold some reserves against transaction deposits, such as checking accounts.[3] Even if they weren't required to, banks would still hold some reserves to settle transactions.

For example, your bank uses its account at a Federal Reserve Bank to transfer funds to other banks to settle checks you wrote or electronic transfers you made. It also uses its reserve account to accept funds from other banks to settle checks or transfers made to you by others. When a bank sends payments on behalf of its customers, the Federal Reserve debits the bank's reserve account, and its reserve balance goes down. When a bank receives payment, the Fed credits the bank's reserve account, and its reserve balance goes up.

Payment inflows and outflows occur throughout each business day and immediately show up in banks' reserve accounts. To ensure a smoothly functioning payment system, the Federal Reserve allows banks to have overdrafts in their reserve accounts during the day, but the overdrafts are monitored, and these daylight overdrafts are expected to be repaid in full by the end of the day.[4] The Fed charges a small fee for daylight overdrafts and a large fee for overdrafts that persist after the 6:30 pm close of business.[5]

Sometimes banks hold excess reserves, reserves in amounts above the required minimum. Excess reserves guard against unexpected payment outflows that could drain reserves below the required level and lead to an overdraft penalty. But there is a cost to holding excess reserves: a bank could have earned interest by lending or investing those funds. Similarly, required reserves, which bankers sometimes call idle or sterile balances, cannot be used to make loans and earn interest. To minimize the loss of interest, banks have reduced reserves by improving reserve management and, more recently, by creating or expanding sweep accounts.

[2]For a more detailed examination of these issues, see the article by Cheryl Edwards.

[3]Reserve requirements have been imposed primarily on transaction deposits, a practice reflecting earlier attempts by the Federal Reserve to use reserve requirements to help target some measure of the money supply. For further discussion of historic rationales for reserve requirements, see Joshua Feinman's article.

[4]For a discussion of daylight overdrafts, see the article by Heidi Richards.

[5]The daily volume of payments sent and received is large—nearly $2 trillion. Craig Furfine's article points out that banks that are active in the payment system typically send and receive payments whose value is around 30 times the bank's overnight reserve balance.

HOW DOES A SWEEP ACCOUNT WORK?

Most checking deposits held at banks at the close of a business day are subject to a 10 percent reserve requirement, but money market deposit accounts have no such requirement.[6] A sweep account takes advantage of this difference—the bank temporarily transfers funds from reservable checking deposits into nonreservable money market deposit accounts.

Consider how a sweep account could work for you. Your bank would set up two separate sub-accounts: one would be a checking account subject to reserve requirements, and the other would be a money market deposit account (MMDA) not subject to reserve requirements. Each month, if your checking balance exceeded some specified maximum, your bank would sweep the excess into the money market account. Later, if your checking balance fell below some preset minimum, your bank would transfer funds from your money market fund back to your checking account.[7] The bank benefits because sweep accounts free required reserve balances, which it can then use to earn interest. In exchange, the bank may pay you interest or reduce its fees for bank services.[8]

As noted earlier, sweep accounts have expanded since 1995. The cumulative amount of sweeps from the beginning of 1995 through July 1998 has been estimated at nearly $300 billion (Figure 1). The resulting drop in checking ac-

[6]Since January 1998, for example, each bank must meet a reserve requirement of 3 percent applied to net transaction accounts totaling between $4.7 and $47.8 million; the 10 percent rate applies to net transaction accounts above $47.8 million. For a detailed description of reserve requirements, see Ann-Marie Meulendyke's book.

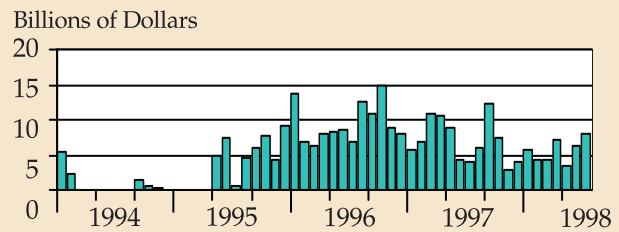
[7]Households have only recently been offered the option of sweep accounts, a financial innovation that became widespread for business accounts in the mid-1970s. The advent of enhanced computer technology and software has enabled banks to sweep household as well as business accounts.

[8]Some programs sweep out balances over weekends; others regularly sweep out all balances above a predetermined target. Regulations limit the number of automatic transfers from an MMDA to six per month; therefore, upon the sixth transfer, all the remaining funds in your MMDA are swept back into your checking account.

FIGURE 1

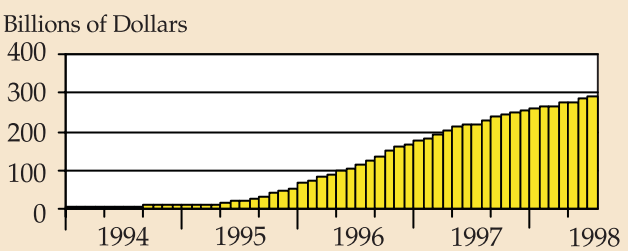
Sweeps of Transaction Deposits into MMDAs

Monthly Averages of Initial Amounts



Sweeps of Transaction Deposits into MMDAs

Cumulative Total



Source: Federal Reserve Board of Governors

count balances was partly offset by strong economic growth, which increased the need for transaction balances. On net, checking account balances declined $174 billion. Required reserves fell $16 billion as a result, to around $43 billion, between January 1995 and July 1998 (Figure 2). While the ultimate effects of sweeps on reserve holdings are uncertain, such programs could reduce the levels of required reserves 50 percent or more from their level in 1994, according to an estimate made by the Federal Reserve Bank of St. Louis.[9]

Over the past few years, a closely watched issue has been whether the proliferation of sweep accounts, and the coincident reductions in reserves in the banking system, would increase the variability of the federal funds rate. To examine this issue, we need to consider how banks respond when confronted with a deficiency or surplus of reserves and how short-term interest rates are related to banks' reserve balances.

THE MARKET FOR RESERVES: THE FEDERAL FUNDS MARKET

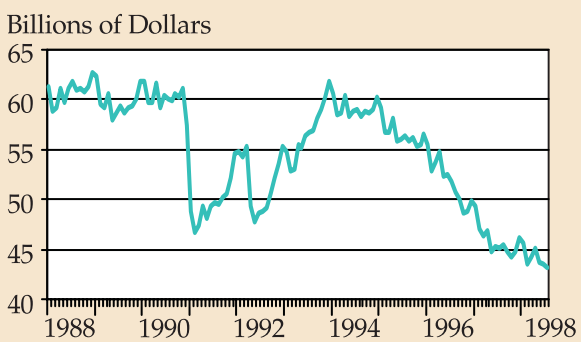
A bank accumulates reserves from customers' cash deposits and payments from other banks and loses them to customers' withdrawals and payments to other banks. Therefore, a bank's reserve level fluctuates.

If outflows push reserves below a desired level, a bank can acquire more in several ways: It can issue certificates of deposit; it can sell a liquid asset, such as a Treasury security; it can borrow directly from the Federal Reserve at the Fed's discount window; or it can borrow reserves in the federal funds market.[10] If a bank has excess reserves, it can purchase a liquid asset, make a loan to a business or household, or lend reserves to another bank in the federal funds market. In the federal funds market, supply and demand interact to determine the quantity of reserves that banks borrow and lend as well as the federal funds rate at which they borrow and lend.

A bank that ends the day with excess reserves is less likely to borrow and more likely to lend in the federal funds market, usually overnight. A bank that ends up with deficient reserves can avoid an overnight overdraft penalty by borrowing in the federal funds market. So banks' daily demands for reserves in the federal funds market depend on banks' daily payments activity. Hence, there is a close link between payments activity, banks' daily reserve demands, and daily movements in the federal funds rate.[11]

[9]See Richard Anderson's article.

FIGURE 2
Required Reserves



Source: Federal Reserve Board of Governors

[10]If a bank chooses to borrow at the Fed's discount window, it must post acceptable collateral, such as a U.S. Treasury security. While the discount rate is typically below the federal funds rate, thereby providing an incentive to borrow from the discount window, discount-window borrowing is to be used only when the bank cannot reasonably obtain funds from other sources to compensate for unusual and unforeseen reserve losses. The Fed administers discount lending in a fashion that discourages banks from frequently asking for discount-window loans of reserves.

[11]For evidence of such a link, see the article by Craig Furfine.

If payments activity becomes volatile, so, too, can banks' demands for reserves and the federal funds rate.

In the face of fluctuations in reserve demands, the Federal Reserve plays an important role by managing the supply of reserves in the banking system.

HOW DOES THE FED MANAGE RESERVES?

The Federal Reserve manages the supply of reserves through the purchase and sale of government securities. When the Fed buys securities, it increases the supply of reserves; when it sells securities, the supply of reserves shrinks. (See *Open Market Operations.*) The objective is to engineer a supply of reserves that achieves a federal funds rate equal or close to a target determined by the Federal Open Market Committee (FOMC). The target for the federal funds rate depends on the state of the economy and, of course, reflects the Federal Reserve's policy goals of a stable price level and maximum sustainable employment and economic growth.

In practice, staff of the Open Market Desk at the Federal Reserve Bank of New York and staff at the Board of Governors in Washington, D.C., generate daily forecasts of reserve demand and of factors affecting the supply of reserves. On the basis of the forecasts, the Desk engages in

Open Market Operations

The Open Market Desk uses open market operations—the sale and purchase of previously issued government securities—to exercise monetary control. In general, when the Desk sells securities to a dealer, the dealer's payment reduces the amount of reserves in the banking system. Conversely, when the Desk purchases securities from a dealer, the Fed pays for them by crediting the reserve account of the dealer's bank at a Federal Reserve Bank, which increases the amount of reserves in the banking system. The Desk engages in two types of transactions to extract or inject reserves: one, outright purchases and sales of securities and, two, repurchase agreements.

Outright Purchases and Sales

The Desk uses outright purchases and sales to effect long-term changes in the supply of reserves. Outright purchases and sales are conducted infrequently.

Repurchase Agreements (Repos) and Matched Sale-Purchase (MSP) Transactions

Most influences on the reserve market are short term, so the Desk uses repos to inject reserves into the banking system on a short-term basis and MSPs to extract reserves temporarily. "Short term" and "temporarily" mean one to a few days. Repos and MSPs are the tools the Desk uses most frequently.

Repos. In a repurchase agreement, the Desk purchases securities from dealers who agree to repurchase them at a specified price and date. When the Desk purchases the security, it adds reserves to the banking system. Then, when the repo matures, the initial injection of reserves is reversed. This is a convenient way for the Desk to deal with short-term changes in reserve-market conditions, since transaction costs for repos are low.

MSPs. Matched sale-purchase transactions (also known as reverse repos) are used to temporarily extract reserves from the banking system. In an MSP transaction, the Desk contracts to sell securities to a dealer and matches that trade with a contract to purchase the securities back from the dealer at a specified price and date. The Desk's initial sale of securities reduces the amount of reserves in the banking system, while its subsequent repurchase returns those reserves to the banking system. MSPs, like repos, are very short term in nature.

transactions to generate a supply of reserves intended to produce the FOMC's desired federal funds rate.[12]

HAS THE OPEN MARKET DESK BEEN SWEPT OUT OF CONTROL?

Because they've been using sweep accounts to reduce their required reserves, many banks now meet their reserve requirements with vault cash alone. Such banks hold reserve deposits mostly to settle payments between their customers and others rather than to meet reserve requirements. Because banks' demand for reserves to settle payments varies more than demand for reserves to meet requirements, it has become harder for the Desk to forecast reserve demand, which means the Desk has more difficulty hitting a specific federal funds rate. In this respect, the spread of sweep accounts has much the same effect as would a cut in the 10 percent reserve requirement.

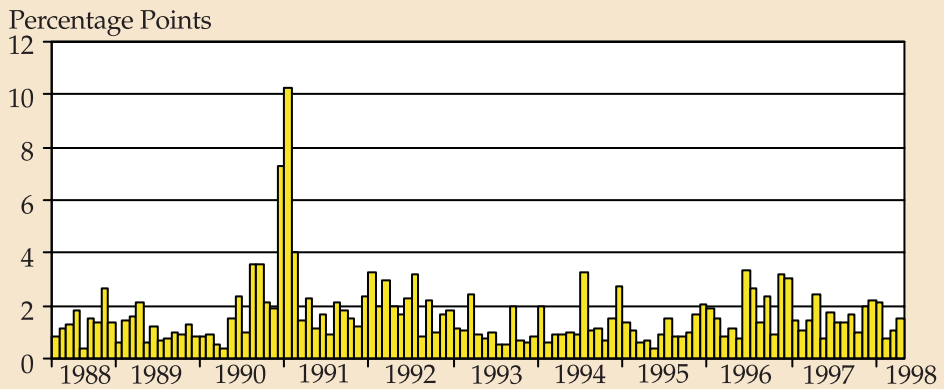
Consider the behavior of the federal funds rate following reductions in required reserves at the end of 1990 and again in April 1992 (Figure 3).[13] Beginning in December 1990, and for the first few months in 1991, the range of the fed funds rate was very wide. However, such large swings did not follow the reductions in reserve requirements in April 1992, perhaps because banks and the Desk had learned from the earlier episode how to better manage reserves in a system with lower requirements. Similarly, after the use of sweep accounts expanded in mid 1995, the federal funds rate became more variable, but not much (Figure 3).

Even if the expansion of sweep account programs adds substantially to the variability of the federal funds rate, are day-to-day or intraday movements in such a short-term interest rate cause for concern? There are a couple of

[12]Additional details of the Desk's activities can be found in the book by Ann-Marie Meulendyke or Marcia Stigum.

[13]In December 1990 the Fed eliminated all reserve requirements on savings (time) deposits and on Eurocurrency liabilities. In April 1992, it lowered the requirement on transaction deposits from 12 percent to 10 percent.

FIGURE 3
Federal Funds Rate: Intraday Range
Monthly Average of Daily High Minus Daily Low
April 1988 - April 1998



Source: Federal Reserve Board of Governors

reasons we might be concerned about increased variability of very short-term interest rates. One, it becomes more difficult for the Federal Reserve to hit its target for the federal funds rate in an environment with greater variability in banks' reserve demands. As a result, the funds rate will deviate more often from the Fed's targeted rate, which may make it more difficult for market participants to gauge the course of monetary policy the Fed wants to take. While the federal funds rate does sometimes deviate from the FOMC's target, the Federal Reserve has not faced great difficulty hitting its target, on average, in recent years. Nor is there evidence that sweep accounts have clouded perceptions about the course of monetary policy. Two, increased variability of short-term interest rates may be transmitted to long-term interest rates, and increased variability in long-term interest rates might cause greater variability in expenditures by households and firms in the economy. However, there is no evidence that more variable short-term interest rates have led to substantially more variable long-term rates in recent years. Nonetheless, the possibility that interest rates might become still more variable as sweep accounts continued to spread led the Federal Reserve to examine ways to reduce potentially deleterious volatility in the federal funds rate.

WHAT DID THE FED DO TO KEEP VARIABILITY IN CHECK?

The Federal Reserve had several options to help reduce day-to-day variability in the federal funds rate. (See *Options for Maintaining Monetary Control in a World of ShrinkingReserves.*) It chose a simple one: changing the period over which banks calculate their required reserves. To explore why the switch in timing reduces variation in banks' reserve demand, and thereby makes the job of monetary control easier, let's see how banks calculate required reserves.

Each bank calculates required reserves on its average amount of transaction deposits over two weeks, called the reserve computation period.[14] To satisfy its reserve requirement, a bank can use two balances. One balance is the average level of reserve deposits held at a Federal Reserve bank during a two-week span called the reserve maintenance period; the other is the amount of vault cash the bank held during an earlier period.[15] Averaging over two-week periods, rather than making banks calculate and meet reserve requirements each day, helps reduce day-to-day volatility in the federal funds rate.

Prior to July 1998 the two-week reserve maintenance period was nearly contemporaneous with the reserve computation period. The computation period ended every other Monday; the maintenance period ended two days later. One problem with this so-called *contemporaneous reserve accounting* method was that banks didn't know their reserve requirement for sure until two days before the end of the reserve maintenance period. Banks that found themselves short of their reserve requirement on the last two days of the maintenance period scrambled to obtain reserves in the federal funds market. Because the Open Market Desk didn't know, and couldn't always forecast, how big banks' shortages of reserves would be, last-minute surges in the demand for reserves sometimes caused spikes in the federal funds rate.

Under contemporaneous reserve accounting, sweep accounts made it even harder for banks, as well as the Federal Reserve, to accurately es-

[14] To arrive at a bank's reserve requirement, the end-of-day balances of a bank's transaction accounts for each day of the computation period are averaged, and this average daily balance is multiplied by the appropriate required-reserve percentage.

[15] Technically there are some other balances that count. Banks are permitted, for example, to carry a surplus or deficit from one maintenance period to the next. The carryover cannot, however, be bigger than a specified fraction of required reserves and must be applied in the next maintenance period.

Options for Maintaining Monetary Control in a World of Shrinking Reserves

Under the Federal Reserve's current operating procedures, monetary control is exercised by targeting a level of the federal funds rate. As we saw in the discussion of the federal funds market in the text, the federal funds rate is determined by the interaction between the demand for and supply of reserve deposits. To reduce the volatility of the federal funds rate, the Federal Reserve has many options. Some options make the demand for reserves less variable; some make the supply of reserves more responsive to variations in the demand for reserves.

Making Demand for Reserves Less Variable

One way to make the demand for reserves less variable is to extend reserve requirements to more accounts. The Federal Reserve's authority to alter reserves and its ability to impose reserve requirements on nonchecking deposits are set out in the Monetary Control Act of 1980 and the Garn-St. Germain Depository Institutions Act of 1982. If reserve requirements are expanded to include more accounts, moving deposits from one kind of account to another will have less effect on required reserves, thus making the aggregate demand for reserves more predictable. If predictability of reserve demand were the objective, expanding requirements might be a solution. However, expanding reserve requirements would lead to even more idle, non-interest-bearing balances in the banking system, and banks would undoubtedly also continue to devote resources to coming up with innovations designed to evade requirements.

A second option would be to eliminate reserve requirements completely, pay interest on any excess settlement balances, and charge a penalty on deficient ones. In principle, the interest and penalty payments can be structured to provide incentives for banks to target positive, negative, or zero settlement balances. The Bank of Canada, for example, provides incentives for zero settlement balances; hence, on average, Canadian banks should have no idle reserves. This option also removes incentives to expend resources to evade reserve requirements and leads to a predictable demand for reserves.

A third option is to keep reserve requirements but pay interest on reserve balances. Paying interest would remove the incentive for banks to evade reserve requirements and thereby lead to a more stable demand for reserves. But paying interest would also increase the Federal Reserve's expenditures, and, consequently, the Fed would have a lower surplus to return to the Treasury. Because of this, the Treasury has not supported recent or past proposals to pay interest on reserves.

timate reserve needs as reserve demands increasingly reflected payments activity. The relatively more volatile payment-related demands for reserves began to dominate demands to meet reserve requirements. As a result, more unforeseen changes in banks' demand for reserves occurred. Such volatility in demand led to increased variability of the funds rate as sweep activity continued.

To reduce the variability of the funds rate, the Fed switched to *lagged reserve accounting*. Two-week reserve computation periods still end every second Monday. But effective July 30, 1998, a bank bases its required reserves for a maintenance period on its average deposits in the reserve computation period that ended two weeks plus two days before the maintenance period begins. Under this regime, banks know exactly what their reserve requirement is at the beginning of each maintenance period and how much of the requirement has already been met with vault cash. The Open Market Desk also knows exactly the amount of reserves that must be held, on average, during each two-week main-

On July 23, 1997, Federal Reserve Board Chairman Alan Greenspan urged Congress to remove the ban that prohibits the Federal Reserve from paying interest on banks' reserve balances. The Fed chairman also suggested a more fundamental change—eliminating reserve requirements altogether. He added that "it might well require significant adjustments in the implementation of monetary policy, including adoption of procedures to control volatility in overnight interest rates that have not been tested in our financial sector." If Congress moves to eliminate reserve requirements, statutory authority to pay "explicit interest on the remaining balances held at the Federal Reserve would be especially useful for monetary policy purposes," Greenspan said.[a]

Making the Supply of Reserves More Responsive to Fluctuations in Demand

One option to make the supply of reserves more responsive to variations in demand is more frequent trading by the Open Market Desk each day. Indeed, the Desk does sometimes trade more than once per day.[b] If reserves continue to decline, making intraday reserve demands still harder to predict, the Desk could act more times each day to offset unexpected movements in reserve demands. However, because the reserve market isn't very active by afternoon, trades in the latter part of a day may not be possible for the Fed, since there aren't many counterparties with whom to trade.

A second option would be for the Federal Reserve to encourage more active use of the discount window by depository institutions. When reserve-market pressures push the federal funds rate up, for example, easy access to the discount window could help ease the pressures. Given the reluctance of banks to use the discount window, this option would require some adjustments to the window to encourage greater use.

A third option would also require revisions to the Federal Reserve's credit facilities. This option, similar to one employed in many European countries, would combine less administrative restraint on use of the discount window and a discount rate above the overnight market rates. This so-called Lombard facility could be useful in dampening upward spikes in the federal funds rate.

[a] See Greenspan's remarks in the Congressional hearing on July 23, 1997. Testifying before the Senate Banking Committee, Treasury Undersecretary John D. Hawke, Jr., agreed that it would be "more fair to banks" if the Fed were allowed to pay interest on reserves, but that it would cost the Treasury too much and "it's not a matter of great urgency." For further discussion, see the article "Treasury Hits Fed-Backed Plan to Pay Interest on Reserves" in the March 11, 1998, *American Banker.*

[b] Trading more than once a day was facilitated by moving up the Desk's normal intervention time from 11:30 am to 10:30 am. This change was effective January 1997.

tenance period. Therefore, the switch to lagged reserve accounting eliminates one source of uncertainty about the demand for reserves and consequently should reduce the volatility of the federal funds rate.[16] Lagged reserve accounting will not eliminate all uncertainty about the demand for reserves, however, as variations in payment flows can still cause unpredictable fluctuations in reserve demand and, hence, in the federal funds rate.[17]

Should the federal funds rate prove too volatile in the future, the Federal Reserve could

[16] Before 1968, contemporaneous reserve accounting was used to calculate reserves. In September 1968, the Federal Reserve switched to lagged reserve accounting to reduce costs and the difficulties banks faced in calculating requirements and managing reserves. A switch back to contemporaneous accounting occurred in September 1982 to tighten the Federal Reserve's short-term control over bank reserves and a measure of the money supply called M1, a supply that varies with changes in bank reserves.

[17] For a technical exploration of the link between the volume of payments in the banking system and the volatility of the federal funds rate, see the article by Craig Furfine and the article by James Clouse and Douglas Elmendorf.

adopt other policies toward bank reserves (see *Options for Maintaining Monetary Control in a World of Shrinking Reserves).* Two of the options—paying interest on reserves and doing away with reserve requirements—would also eliminate the incentive for banks to use sweep accounts, or other means, to evade reserve requirements.[18]

CONCLUSION

Using sweep accounts to conserve on interest-barren reserve balances has reduced reserves in the banking system. As reserve balances decline, some participants in the financial market are concerned about the effects on monetary control, particularly the effect on the Fed's ability to control short-term interest rates.

To dampen the variability of reserve demand and to avoid potentially higher variation in short-term interest rates, the Federal Reserve Board made a simple change: a return to lagged reserve accounting. This move will make it easier for banks and the Federal Reserve to estimate reserve demands, even in the face of continued growth of sweep accounts. While sweeping changes in banks' reserve management may continue, it appears that the Federal Reserve's ability to hit its target for the federal funds rate will not be swept away.

[18]Interest is paid on reserves in Italy, the Netherlands, and Switzerland. Some countries, such as Canada, currently operate with zero reserve requirements along with interest on excess settlement balances and penalties for deficiencies. For details of the Canadian experience, see Kevin Clinton's article.

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