

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

*Jeffrey M. Wrase**

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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¹In 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.

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

³Reserve 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.

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

⁵The 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.

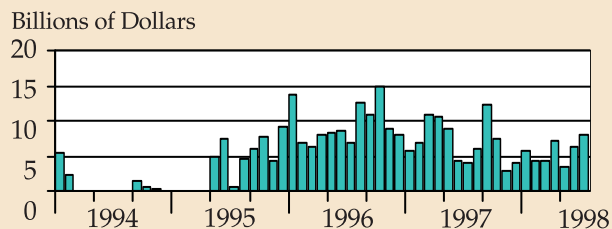
Consider how a sweep account could work for you. Your bank would set up two separate sub-accounts: one would be a checking account subject to reserve requirements, and the other would be a money market deposit account (MMDA) not subject to reserve requirements. Each month, if your checking balance exceeded 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

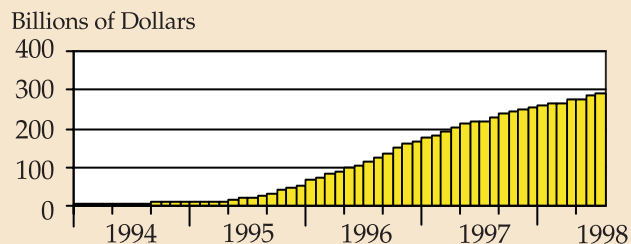
As noted earlier, sweep accounts have expanded since 1995. The cumulative amount of sweeps from the beginning of 1995 through July 1998 has been estimated at nearly \$300 billion (Figure 1). The resulting drop in checking ac-

⁸Some 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

⁶Since 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.

⁷Households 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.

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

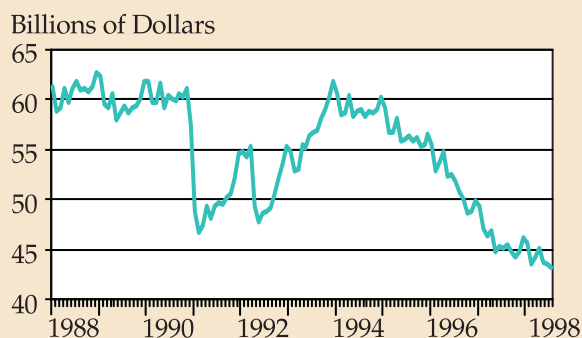
banks and loses them to customers' withdrawals and payments to other banks. Therefore, a bank's reserve level fluctuates.

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

⁹See Richard Anderson's article.

FIGURE 2
Required Reserves



Source: Federal Reserve Board of Governors

¹⁰If 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.

¹¹For 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 SWEEPED 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.

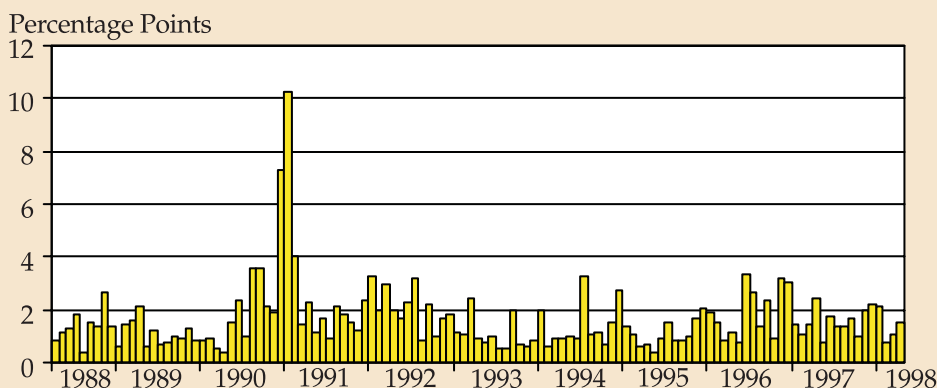
¹²Additional details of the Desk's activities can be found in the book by Ann-Marie Meulendyke or Marcia Stigum.

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

¹³In 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 Shrinking Reserves*.) 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-

¹⁴To 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.

¹⁵Technically 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.

imate 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

¹⁶Before 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.

¹⁷For 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

¹⁸Interest 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.

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.

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Why Is Europe Forming A Monetary Union?

*Gwen Eudey**

European countries have become more and more integrated in recent decades. Now, Europeans routinely sell goods and services across national boundaries, own stocks and bonds from other countries, and work abroad. But since each country has its own currency, Europeans spend a lot of time and resources trading one currency for another.

To make their financial lives easier, 11 European countries are joining together to form the

European Monetary Union (EMU), which will have only one currency, the euro.¹ A common currency will not only save these countries time and money, but it will also increase trade within Europe as well as make it easier for citizens of one country to buy stocks and bonds in another.

However, monetary union also has costs. European countries can now adjust their exchange-rate and monetary policies in response

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¹The EMU will be formed on January 1, 1999. Initial members will be Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain. For a discussion of the criteria for membership, see the article by Joseph Whitt.

to severe domestic economic problems. Although the introduction of a single currency will simplify trade between European countries, each country will give up the ability to use monetary policy to influence its economy. No individual country's central bank will be able to set interest rates. And no country in the EMU will be able to adjust its exchange rate vis à vis the others.

How large a sacrifice will it be to give up independent monetary and exchange-rate policies? The answer depends on the types of macroeconomic "shocks" that hit the economy and how well other adjustment mechanisms compensate for the lack of exchange-rate flexibility. In particular, it will depend on the degree to which prices and wages adjust to accommodate those shocks, the degree to which labor can move across borders, and the extent to which fiscal policy can be used to control the economy.

BENEFITS OF A SINGLE CURRENCY

The move to a single currency has many potential benefits. As noted above, reducing the costs of trading one currency for another is the most important. A single currency also helps nations in a number of other ways, such as reducing uncertainty about future exchange rates and preventing countries from devaluing their currencies to promote exports.

Reducing Costs of Exchange. When an importer pays for goods, domestic currency must be exchanged for foreign currency at a bank. The bank will demand a service charge for this transaction. For firms that import many supplies or that export to many countries, such transaction costs may be sizable and will partly be passed on to consumers through higher prices. These transaction costs are estimated to be roughly 0.4 percent of the gross domestic product of potential members of the European Monetary Union.²

²See the article by the European Commission.

Reducing Exchange-Rate Uncertainty. Although many countries now operate with a flexible exchange-rate system, the countries preparing for monetary union have already limited how much their currencies move with respect to each other. Each country stabilizes the exchange rates between its currency and the other 10, and the exchange rates of all move jointly relative to other currencies in the world. Policymakers can make large adjustments in the rate at which one European currency is exchanged for another only when economic circumstances in one country change a great deal relative to circumstances in the others.

Though large adjustments are infrequent, the current system allows a fair amount of day-to-day volatility in exchange rates. The resulting uncertainty about the future value of a currency poses a risk for importers and exporters. Imagine a French manufacturer contracting to export a certain amount of equipment to Italy six months from now. A price will be agreed upon today, payable in six months in French francs. If the cost of French francs in terms of lira rises during that period, the Italian importer will find herself paying more for the equipment than she had originally intended. Exchange-rate risk is, of course, associated only with international trade, so the Italian importer may prefer a local producer even if the French producer is currently less expensive. Although an importer or exporter can hedge against possible changes in the exchange rate by using forward or futures contracts, this activity is costly.

Thus, exchange-rate risk reduces trade by imposing a hidden cost on the transaction. A single currency eliminates all exchange-rate risk between the countries in the EMU and therefore increases trade and the benefits associated with it. These benefits include a greater variety of products and lower prices due to competition and economies of scale from producing for a larger market. In fact, many economists believe that one of the greatest benefits of a single currency comes from its favorable

effect on trade from increased competition.

Preventing Competitive Devaluations. Between world wars I and II, European countries engaged in what are known as competitive devaluations: one country would devalue its currency to boost its export sector, and its trading partners would retaliate by devaluing their currencies as well. Reducing the value of currency is inflationary, so competitive devaluations caused an inflationary spiral during that period. Although the current European exchange-rate arrangement is designed to limit the threat of competitive devaluations, such devaluations remain possible so long as there are multiple currencies whose exchange rates are set by policymakers, rather than determined by the market as in a floating exchange-rate system.

As trade between European countries has increased, the costs to one's trading partners from using a competitive devaluation have increased but so have the potential gains to any one country. However, the effect of competitive devaluations on the world's economic welfare is clearly negative, and it can be disastrous if retaliation leads to a devaluation spiral. A single currency eliminates the threat of this type of competition.

Preventing Speculative Attacks. Because it allows large, though infrequent, exchange-rate adjustments, the current European exchange-rate mechanism is vulnerable to speculative attacks: if speculators believe the value of a currency will be reduced (devalued relative to other European currencies), they will sell their holdings. If enough speculators believe this, confidence in the value of the currency may collapse and may force the government to devalue even if that had never been its intent.

Although a government can try to thwart speculators by raising interest rates and thereby the return to holding money-market instruments denominated in that currency, there's a downside to doing so: higher interest rates mean that business firms face higher borrowing costs, so they'll do less borrowing and in-

vesting in new plant and equipment, which, in turn, will lead to slower economic growth.

The exchange-rate crisis of 1992 illustrates the effect of speculative attacks on the economy. Europe at that time had been in a deep recession for two full years; the average European unemployment rate was approximately 10 percent. Short-term political pressures in the countries most badly hit by the recession argued for a low-interest-rate policy to stimulate investment and bring about recovery. But such a policy would be inconsistent with maintaining stable exchange rates unless the policy were pursued across all of Europe. If only one country were to lower its interest rates, financial capital would move out of that country to ones that still had high rates (so long as capital is free to move, as in Europe). This movement of capital would put pressure on exchange rates.

However, although this recession affected all of Europe, there was no unanimity as to the appropriate interest-rate policy to pursue. The German government and central bank felt that they had already excessively stimulated the German economy in an attempt to help the former East Germany catch up with the West. Those policies, they believed, were already putting inflationary pressure on the economy.³ To offset those inflationary pressures, Germany was pursuing a high interest-rate policy. Because of Germany's relative size and economic importance in Europe, the other European countries were forced to raise their rates as well if they wanted to maintain stable exchange rates. All committed to doing so, but this commitment was not credible in the eyes of currency speculators. Speculators began to bet that at least three countries—the U.K., France, and Italy—would succumb to domestic political pressures and deviate from Germany's interest rate policy.

In September 1992 speculators began to bor-

³See the report by the Bundesbank.

row British pounds, French francs, and Italian lira and to convert the proceeds into German marks and U.S. dollars because they expected the price of pounds, francs, and lira to fall after the governments abandoned their commitment to keep interest rates as high as necessary to maintain a stable exchange rate. As more and more speculators sold these currencies, their value in terms of German marks continued to fall. In an attempt to attract buyers to their currencies, the British, French, and Italian governments offered very high rates of return on short-term instruments denominated in their home currencies. A side-effect of this policy was a deepened recession in those countries, which made adherence to fixed exchange rates increasingly unpopular. That unpopularity, in turn, increased speculation that the policy of fixed exchange rates would not be sustainable. Of the three, only France was able to successfully ward off the speculative attack. Both Britain and Italy abandoned their fixed exchange rates as a result of the speculative pressures.

Although France "survived" the speculative attack on its exchange rate, survival was costly in the sense that the high interest rates and increased uncertainty prolonged high unemployment and low growth in that country. Britain and Italy recovered from the recession more quickly because lower interest rates and depreciation of their currencies stimulated domestic spending and exports. But there were costs to Britain and Italy as well; however, these costs came later, when inflation rose as a result of the devaluations.

Since much of the speculative activity within Europe has occurred when speculators have bet that one European currency would be devalued relative to another, moving to a single currency would eliminate such activity. And since investors will not have to be compensated for uncertainty about exchange rates, interest rates will fall, thereby stimulating investment and growth within the EMU. Although interest rates will fall more in those countries that are now

subject to the most speculation, many economists think that all countries will benefit from lower rates as the world economic environment becomes less risky.

COSTS OF A SINGLE CURRENCY

The benefits of switching to a single currency don't come without costs. Probably the biggest cost is that each country cedes its right to set monetary policy to respond to domestic economic problems. In addition, exchange rates between countries can no longer adjust in response to regional problems.

As a practical matter, the costs associated with giving up the possibility of independent monetary policy may be small for most European countries. As part of their effort to stimulate trade and investment, potential EMU members have eliminated all barriers to international capital flows, which has created a very competitive multi-country financial market. Consequently, there is little or no difference in the cost of borrowing (the interest rate) in the different countries so long as exchange rates between European currencies are kept fairly stable. This European interest rate is determined by the large European countries, implying that small countries in the European Union do not have the ability to lower interest rates during recessions unless they are willing to see their currencies devalued. In other words, European financial and exchange-rate treaties have left small member countries effectively without the ability to conduct independent monetary policy. But all member countries will have representation in monetary policy decisions after monetary union. The EMU will give small countries some influence in determining the European interest rate even as it formally eliminates the possibility of using independent monetary policy and exchange-rate adjustments.

The EMU member countries have also agreed to limit the use of fiscal policies. Consequently, when one or several countries within

the currency union, but not all, face recession or an overheated economy, adjustment must occur largely through changes in wages and prices or through the movement of workers from one country to another.

Monetary Policy. The biggest change in moving to a single currency is that each country will relinquish control over monetary policy to the new European central bank that will issue the single currency for all the countries in the union. But what happens if a recession hits just one country? Currently, its central bank may respond to the recession by increasing the money supply, thereby pushing interest rates downward and stimulating investment and economic recovery. The central bank for the European Monetary Union will be unlikely to use expansionary monetary policy to help one country, since doing so would cause inflation in those EMU countries not in recession.

To illustrate the consequences of having a single currency when there are disparate regional interests, let's consider a scenario in which Europe already had a single currency in 1992.

A single European currency in 1992. What would have happened had there been a single European currency at the time of German reunification and the 1990-92 recession if a European central bank had raised interest rates as the German central bank did? Consider first the implications for Britain and Italy: Britain and Italy devalued their currencies and lowered interest rates to stimulate exports and investment, allowing them to recover more quickly from recession but at the eventual cost of inflation. If they had been members of a currency union following Germany's interest-rate policy, they would not have been able to devalue, nor would they have been able to lower interest rates to stimulate investment for a quicker recovery. Thus, Germany would have combated its inflation through the high-interest-rate policy of the currency union, but Britain and Italy would have had prolonged recessions.

In lieu of reducing interest rates and devaluing their currencies, Britain and Italy might have used fiscal policy to stimulate their economies. Both nations could have cut taxes or increased public investment to stimulate aggregate demand during the recession, but such actions would have increased budget deficits and required additional government borrowing. Large and persistent government borrowing by one or more countries could impose costs on all countries in the monetary union by putting upward pressure on interest rates or by forcing the European central bank to increase the money supply to avoid higher interest rates, thus risking higher inflation. Therefore, European governments have agreed that none of the countries participating in the EMU will allow its yearly budget deficit to exceed 3 percent of its GDP. Moreover, participating countries have agreed that any country whose budget deficit exceeds that cap will pay substantial penalties to the others. These agreements prevent countries from issuing excessive amounts of government debt over the long run, but they also seem likely to restrict each country's ability to use stimulative fiscal policy during recessions.

These agreements do not, however, prevent using a federal fiscal policy to address regional imbalances in the currency union: those regions that are overheating could be taxed more heavily and the proceeds spent in the areas in recession. In the example above, policymakers in 1992 might have cooled inflationary pressures in the western part of Germany by raising taxes there and might have stimulated recovery in Britain, Italy, and France by spending the extra tax revenue on public investment in those countries. Currently, the federal budget for the European Union is not used as a tool to address recessions or overheating, either in particular countries or in Europe as a whole.

Of course, if economic adjustment from recessions happens quickly, there is very little cost associated with giving up interest- or exchange-rate policy and no need for federal redistribu-

tion. The speed of recovery depends greatly on the flexibility of the European labor market. If workers are highly mobile, British and Italian workers who are unemployed or earning low wages during the recession will quickly relocate to Germany or other countries that have a high demand for labor. This type of flexibility has an equalizing effect across the monetary union and makes for greater symmetry in policy objectives. In Europe, however, cultural and linguistic differences hinder labor movements across countries, so this particular type of labor-market flexibility is not promising in the near future.

A second form of labor market flexibility occurs through wage adjustments. If, in a recession, workers are willing to accept lower wages, employers will not only be able to maintain the same number of employees but also to pass on the reduction in payroll costs in the form of lower prices. Lower prices, in turn, spur exports and lead domestic consumers to buy fewer imports and more locally made goods. That increase in demand spurs economic recovery. In practice, however, although wages seem to go up during booms, they do not fall so readily during recessions.

Thus, given that budget deficits in Italy and Britain in 1992 were already at or above 3 percent of GDP and that European labor markets are fairly inflexible, recovery in those two countries would have been much slower had they been members of a monetary union that followed Germany's high-interest-rate policy. France, however, might have experienced a quicker recovery under monetary union because French policymakers, determined to prevent devaluation of the franc and the resulting inflation, responded to the speculative attack by raising interest rates even more than Germany had. Thus, monetary union would have imposed no additional burden on the French economy, and moreover, it would not have suffered the destabilizing consequences of foreign-exchange speculation. Thus, it is important to

understand not only how regions differ in terms of their position in the business cycle but also cultural preferences and differences in policymakers' goals.

The 1990-91 recession: The U.S. experience. The United States also suffered a recession during the 1990-91 period. Although the recession was less severe in the United States than in Europe, the United States experienced regional differences in the severity and length of the downturn. The recession came as federal military expenditures were being cut back, and regions such as southern California, which had a heavy concentration of defense contractors and military bases, were particularly hard hit. Consequently, unemployment in California was higher than in the rest of the country; by 1993, U.S. unemployment was only 6.5 percent while in California unemployment stood at 8.6 percent.

The federal tax and transfer system aided unemployed Californians through unemployment benefits. The federal government also aided the region by subsidizing conversion of military bases to commercial use, the revenues for which came from more prosperous regions of the country. Labor-market flexibility also contributed to eventual recovery as workers migrated from California to neighboring states. Although direct evidence of worker migration is hard to come by, one careful study indicates that there was a net immigration of about 200,000 people from other states to California from mid-1989 to mid-1990 (just before the recession began) and a net out-migration of more than 250,000 people from mid-1993 to mid-1994.⁴ That out-migration was just under 1 percent of California's population. The outflow of the labor force, of course, put competitive downward pressure on wages in neighboring states, another painful part of the adjustment process.⁵

The relatively deep California recession also

⁴See the study by Hans Johnson and Richard Lovelady.

hurt neighboring states by reducing their firms' sales to Californians, which resulted in further job losses, most especially in Arizona, Nevada, and Hawaii. Thus, the flexibility of the labor market helped bring about recovery in California, but at the expense of exporting recession and unemployment to the rest of the region. In this particular example, fiscal transfers, sustained demand for the non-military goods sold to other states, and the availability of jobs in neighboring states lessened California's pain. However, in spite of these means of adjustment, which are necessary in a monetary union such as the United States, the relatively high unemployment that remained in California in 1993 demonstrated that the adjustment process in the United States is still a difficult one despite the country's relatively high labor-market flexibility and large fiscal budget.

REDUCING THE COSTS AND PRESERVING THE BENEFITS

The examples above show that the keys to a currency union's ability to adjust to economic shocks are the degree to which wages and prices are flexible and the ease with which labor moves across borders. So how is Europe likely to fare?

European Labor Markets Are Inflexible. Although labor-market flexibility can substitute for a policy response, labor-market flexibility in Europe is clearly much lower than that in the United States.⁶ Compared with their U.S. counterparts, European workers are much more willing to remain unemployed rather than accept lower wages. They are also much less willing to move out of regions with high unemployment rates. This situation is only partly due to the language and cultural barriers that hinder cross-country movements; European workers

are also less likely to move within their own countries in response to labor-market pressures. This reluctance may reflect the relatively high unemployment compensation in Europe.⁷

European governments recognize the need for greater labor-market flexibility, but attempts at labor-market reform are controversial. There has been some progress, however. For example, workers are now free to move across national borders, and this movement can reduce the cost of regional shocks. But it seems unlikely that European labor markets will be able to meet the demands for flexibility in the short run, following formation of the EMU.

The costs associated with losing independent monetary and exchange-rate policy might be small if there were either little evidence of regional asymmetry or great evidence of labor-market flexibility. In the European case, the opposite is true. In a well-known paper, Tamim Bayoumi and Barry Eichengreen find not only that shocks are more symmetric across regions in the United States but that labor markets in the U.S. regions stabilize much more quickly than labor markets in European countries. These findings seem to suggest that Europe will not form as successful a monetary union as that in the United States, since regional losses may be greater in Europe than the U.S. experience would suggest, but that conclusion might be premature.

Examination of labor-market flexibility compares the abilities of the United States and Europe to adjust to economic shocks. But comparing the shocks, as Bayoumi and Eichengreen do in their paper, may not be appropriate because it involves comparing asymmetries within an existing monetary union to those in a potential one. After inauguration of the EMU, sources of asymmetry will be reduced. For example, the EMU will eliminate asymmetries in setting monetary policy. Furthermore, countries

⁵See the article by Brian Cromwell.

⁶See, for example, the article by Tamim Bayoumi and Barry Eichengreen.

⁷See the article by Jose Vinals and Juan Francisco Jimeno.

that run fiscal deficits out of line with the European norm will be fined. In addition, the U.S. federal income tax and welfare systems redistribute income from expanding to contracting regions; this leveling effect may make U.S. regions appear more symmetric in their cyclical movements than their European counterparts. As similar tax and welfare policies take hold within the European Union, redistributive policies may create more symmetry across regions there as well.⁸

Although a single currency should lessen fiscal and monetary sources of asymmetry, there are, at the same time, reasons to suspect that adoption of a single currency may increase asymmetry within the EMU. By reducing transaction costs, adopting a single currency may increase trade. Trade tends to encourage regional specialization in the production of goods. If regions specialize in the types of goods they produce, shocks to demand or to the production of any particular good will affect regions differently. If monetary union does increase trade, regions within the common-currency area may become less alike than they are now. Ambiguity about the effect of monetary union on the structure of the economy makes evaluation of the potential costs and benefits of the EMU highly speculative.⁹

Could Fiscal Policy Help? Faced with asymmetric shocks, members of the EMU may have to rely more heavily on fiscal policy to compensate for the lack of independence in setting monetary policy. The current trend in Europe, however, leans toward the reduction of national budgets. As indicated earlier, taxation and redistribution across EMU countries may be a

promising approach. But the European Union's budget is currently much too small for such a task; however, it may increase to meet the demands of post-monetary-union Europe in the next century.

How Do Countries in Europe Compare with Each Other? At one time economists referred to Europe as consisting of a "core" and a "periphery," with the core represented by the U.K., France, Germany, and perhaps Austria, and the periphery by the Mediterranean countries. Relatively large budget deficits and high inflation rates distinguished "peripheral" countries, as did the fact that their business cycles were rarely in sync with those in "core" countries.

This breakdown is no longer as clear as it once was, however. Budget deficits in Germany and France have grown over the past eight or nine years, while those in the once-peripheral countries have fallen, as have their interest and inflation rates. German re-unification represented a large asymmetric shock, relative to the rest of Europe, from which Germany is still recovering.¹⁰ Nonetheless, Europe as a whole has undergone a period of dramatic convergence in interest and inflation rates and government budget deficits since the ratification of the Maastricht Treaty on monetary union in 1993. This convergence may indicate increasing symmetry and harmony in policy objectives as the January 1, 1999, date for monetary union approaches.

SUMMARY

There are both costs and benefits associated with forming any monetary union. The benefits of monetary union stem from reducing transaction costs and eliminating exchange-rate uncertainty. Falling transaction costs mean fewer barriers to trade, which should increase com-

⁸See the article by Barry Eichengreen for a discussion of the anticipated role of tax and welfare policies across EMU member countries.

⁹See the article by Maurice Obstfeld for a description of the mechanics behind conversion to the single currency.

¹⁰See the article by Hans Werner-Sinn, which treats German re-unification as an asymmetric shock within Europe.

petition and reduce prices. Eliminating exchange-rate uncertainty will spur still more trade; it may also lower interest rates, therefore making it cheaper to borrow to finance new investment. In the European case, the benefits may be greater still because if each country has its own currency, speculative pressures heighten the risk of costly exchange-rate movements.

The costs depend on the extent to which member countries would prefer to use independent exchange-rate and monetary policies, on the asymmetry of shocks to their economies, and on how willing unemployed workers are to move or accept wage cuts. Compared to the United States, EMU countries are more likely to experience regional shocks, and these shocks

are less likely to meet with speedy labor-market adjustment.

Whatever the costs of EMU, mechanisms other than domestic monetary or exchange-rate policy will have to bear the burden of economic adjustment after adoption of the single currency. Barriers to movements of labor have been removed, which encourages that adjustment process. Further labor-market reforms may be necessary to increase labor markets' speed of adjustment. In addition, member countries may find it necessary to institute international tax and redistribution policies through growth of the European Union's budget to allow for regional differences in policy stimulus or restraint.

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