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# Thoughts on the Federal Reserve System's Exit Strategy

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**ABSTRACT**

Now that global financial markets are beginning to stabilize, the Federal Reserve is considering how best to reabsorb liquidity so as not to create inflation as the economy revives. Three broad strategies for managing monetary reserves in the United States include: (1) paying interest on excess reserves, (2) managing interest rates on short-term deposits, and (3) selling back financial assets such as mortgage-backed securities. From a theoretical standpoint, these strategies are identical; which approach is employed is not of fundamental macroeconomic importance.

Nevertheless, this note argues that several potentially large dangers associated with the first two strategies have been overlooked, whereas a frequently cited weakness of asset sales has been exaggerated. The best course is a careful blend of all three approaches, with strong emphasis on a preannounced program of gradual sales of financial assets. Such a joint strategy is likely to have the highest probability of success in draining reserves, with minimal risk.

## Introduction

Global financial markets have recently experienced their most significant crisis since the Great Depression, and they remain under considerable, if diminished, stress. The Federal Reserve System pumped trillions of dollars into the U.S. economy in a determined though imperfect effort to restore liquidity and steady markets. Now that markets are beginning to stabilize, the Fed is considering how best to reabsorb some of that liquidity so that the vastly expanded money supply doesn't create inflation as the economy slowly revives.

This brief note reviews three broad strategies that are now under consideration for managing monetary reserves in the United States: (1) paying interest on excess reserves held at the Fed,[1] (2) managing interest rates on short-term deposits at the Fed, and (3) selling back financial assets such as mortgage-backed securities. It then suggests that several potentially large dangers associated with the first two strategies have been overlooked, while a possible weakness of asset sales—currently, the least-favored of the three strategies—has been overstated. The best course, I assert, is a careful blend of all three approaches, with strong emphasis on gradual sales of assets.[2]

It should be noted that these views are the author's alone, not necessarily those of others in the Federal Reserve.

## Preface to the discussion

Before I elaborate on this argument, it is important to emphasize that from the standpoint of economic theory, these strategies are essentially identical. That is, if markets were "complete" in the sense that no practical impediments—imperfect flow of information, differing access to markets, frictions in market functioning—prevented their smooth operation, then any and all of these strategies would have equal efficacy. Such impediments may affect market outcomes over the very short term, but are unlikely to be very important over a horizon of two or three years.

Consequently, the question of which strategy is pursued is not of fundamental significance to the course of the macroeconomy. The choice of one or the other will neither create nor prevent a Great Depression or Great Inflation. Nevertheless, the question of how best to manage reserves is not unimportant. Because markets are *not* complete and since frictions *do* exist, each strategy can have a significant effect on both the economy and the conduct of future policy. Careful consideration is therefore in order.

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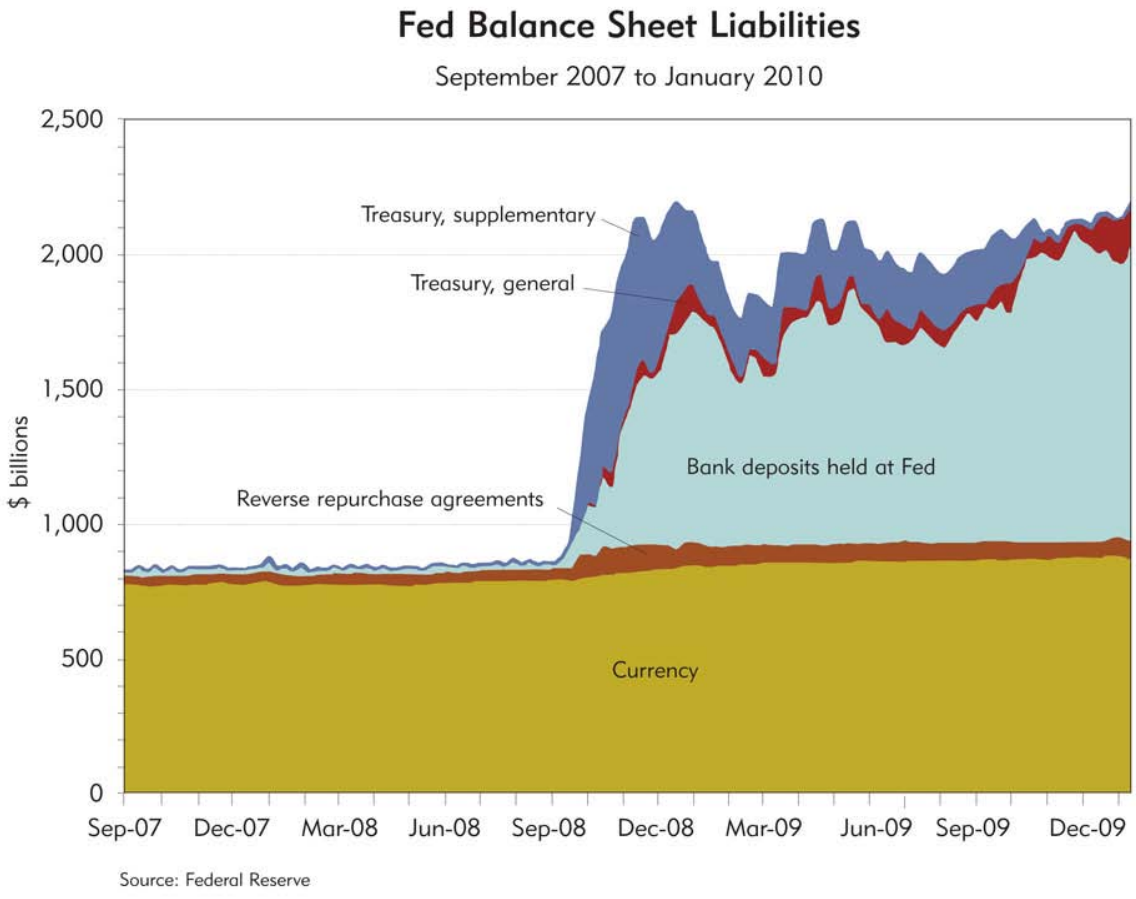
[1] "Excess" reserves are deposits that banks hold in excess of reserves required by law to back deposits.

[2] For the technical basis of the current article, see V. V. Chari, "Thoughts on the Federal Reserve System's 'Exit Strategy,'" Federal Reserve Bank of Minneapolis, March 2010.

**Background**

The U.S and world economies have undergone and continue to undergo a severe financial crisis. The dramatic increases in various yield spreads (such as that between interest rates banks charge one another for loans, the LIBOR, and rates on comparable-term Treasury bills—the so-called TED spread) in the fall of 2008 together with a dramatic increase in the likelihood of failure of a number of financial institutions have led to large changes in the scale and scope of central bank activities throughout the world.

In particular, the Federal Reserve System has increased its balance sheet to a historically unprecedented size relative to the economy. The accompanying chart shows the Fed's balance sheet liabilities. As is apparent, the balance sheet has risen dramatically since the summer of 2008. From the end of August 2008 to the middle of January 2010, deposits held by depository institutions at the Fed have risen from less than $20 billion to over $1.1 trillion. Excess reserves have risen over the same period from roughly $2 billion to over $1 trillion.



It is reasonable to suppose that banks have been willing to hold such a large volume of assets at the Fed because short-term interest rates offered by the market have declined to essentially zero, while the Fed has been paying interest at an annualized rate of 25 basis points (0.25 percent) on balances held at the Fed.

The markets and the Fed are concerned about the implications of this large stock of reserves on the course of future monetary policy and future inflation. The primary source of this concern is that, if the stock of "high powered" money—that is, currency and reserves that are very liquid—is maintained at current levels, the stock of broader monetary aggregates—that is, the money supply as a whole—will rise dramatically.

Indeed, if the reserve-to-deposit ratio (that is, the "reserve ratio") returns to its precrisis levels, we can expect broad money aggregates to increase by a factor of roughly 50,[3] which is highly likely to lead financial markets to expect a large increase in inflation.

This reasoning suggests that the Federal Reserve System must plan for an exit strategy if and when banks choose to reduce their holdings of excess reserves.

**Three strategies**

To repeat, three broad strategies are being considered that would allow the Fed to manage reserves over the next few years. Two of them focus on inducing banks to maintain reserves at proper levels. The third focuses on selling off financial assets that were purchased by the Fed to stabilize asset markets and inject liquidity into the financial system.[4] (The Fed is also

[3] The money supply is highly sensitive to changes in the reserve ratio; the so-called money multiplier, the amount of money generated by the banking system with each dollar of reserves, is the reciprocal of the reserve ratio. So if the reserve ratio declines, the multiplier and therefore the money supply increase.

[4] It may help to consider a very simplified picture of components of the money supply through a basic equation: $M = C + R + D$, where $M$ stands for the overall supply of money in the U.S. economy. As the equation suggests, the money supply ($M$) equals the sum of three elements: the total stock of currency ($C$) in the economy, the stock of excess reserves ($R$) that banks and other financial institutions have on deposit at the Fed, and the stock of deposits ($D$) that individuals, corporations, governments, and others hold on deposit at the Fed. Strategies 1 and 2 in the discussion that follows focus on achieving the right level of $M$ by managing $R$ through raising or lowering the rate of interest paid on those reserves. Strategy 3 affects $C$ and $R$ because to buy assets from the Fed, purchasers would spend a portion of the currency they hold and/or their reserves at the Fed. Because of the money multiplier, relatively small changes in $R$ can have a disproportionate effect on growth in $M$, which in turn causes large changes in price levels.

considering another tool: reverse repurchase agreements. Reverse repos are, for all practical purposes, similar to strategies that effectively pay interest on reserves.)

First, consider those strategies that focus on managing reserves by inducing banks to maintain healthy levels of reserves at the Fed. If banks draw down their excess reserves too quickly as they seek to use these funds for alternative purposes (such as making personal loans or business investments), the economy will be flooded with more liquidity than it may be able to handle at still weak levels of macroeconomic activity, giving rise to increased inflation as, in the oft-used phrase, "too many dollars chase after too few goods." Managing reserve flows can therefore contain money supply growth to levels that will encourage economic growth without overheating price levels. Two Fed strategies focus on management of reserves.

**Strategy 1: Raising interest rates on overnight reserves**

Currently, U.S. banks hold more than $1.1 trillion of reserves with the Federal Reserve System. To restrict excessive flow of reserves back into the economy, the Fed could increase the interest rate it pays on these reserves.[5] Doing so would not only discourage banks from draining their reserve holdings, but would also exert upward pressure on broader market interest rates, since only rates higher than the overnight reserve rate would attract bank funds. In addition, paying interest on reserves is supported by economic theory as a means of reducing monetary inefficiencies, a concept referred to as "the Friedman rule."[6]

While this strategy, discussed at some length by Fed Chairman Ben Bernanke in recent congressional testimony,[7] is attractive in several ways, it also has one very evident drawback. Because the Fed has never held such a large volume of reserves and has only recently been

[5] Congress granted the Fed statutory authority in 2006 to begin paying interest on these reserve balances. The Fed made the first such payments in October 2008.

[6] Milton Friedman argued that to encourage efficiency by decreasing transaction costs, the opportunity cost of holding money should be equalized to the government's cost of creating additional money. The latter is close to zero, so the nominal rate of interest should also be zero, said Friedman, suggesting that the central bank should aim for a rate of inflation that is negative, since the real interest rate is usually positive. In the current context, the Friedman rule suggests that to minimize banks' costs of holding money in the form of reserves at the Fed, government should pay a positive interest rate on those reserves.

[7] Ben S. Bernanke, Feb. 10, 2010, *Federal Reserve's Exit Strategy*, Testimony before the Committee on Financial Services, U.S. House of Representatives. http://federalreserve.gov/newsevents/testimony/bernanke20100210a.htm

authorized to pay interest on them, neither the Fed nor financial markets has much experience in communicating and interpreting the signals conveyed by adjusting those rates.[8]

The consequent uncertainty about the intent and effect of any such rate changes may induce a great deal of volatility in the quantity of reserves. And by the same token, large rate changes may be required to induce the flows sought by the Fed. In either case, large movements may well be interpreted by markets as changes in the course of future Fed policy and would therefore hamper the Fed as it pursues its dual mandate of low inflation and maximum employment. The volatility due to this signaling problem is inherent to the transient nature of reserve holdings—banks can withdraw or deposit them literally overnight, and interest rates could conceivably change just as rapidly.

The Fed is well aware of this volatility issue and has therefore suggested that it may instead favor using a different tool to contain the flow of reserves.

**Strategy 2: Offering banks higher interest rates on short-term deposits**

This second strategy avoids the volatility provoked by the signaling problems of reserve interest rates, and the Fed seems most intent on pursuing it. With this mechanism, the Fed would offer depository institutions term deposits, similar to certificates of deposit purchased by bank customers, by creating a term deposit facility that would auction large blocks of term deposits at attractive interest rates on balances held for periods of three months, six months, or longer. This tool would convert excess reserves into short-term deposits that could not be used for very short-term investments or loans and therefore would not immediately increase the money supply. The Fed will begin testing transactions of this nature this spring.

Again, strategy 2 holds one clear advantage over strategy 1, the benefit that explains why the Fed may well prefer it. Because term deposits lock up reserves for several months, rather than days, they would stimulate far less volatility than overnight reserves and may therefore lead to less confusion than movements in the overnight reserve rate and what those rate movements might or might not signal about long-term Fed policy.

[8] In his February 2010 testimony, ibid., Chairman Bernanke noted that "it is possible that the Federal Reserve could for a time use the interest rate paid on reserves, in combination with targets for reserve quantities, as a guide to its policy stance. … No decision has been made on this issue" (p. 10). He also referred to future consideration of the so-called corridor system—similar to that used by the European Central Bank—which would bracket the federal funds rate target between the discount rate above and the interest rate on excess reserves below.

**Unrecognized concerns**

There are, however, two significant concerns inherent to both of these strategies: interest rate risk and rollover risk, considerations that have been largely overlooked in debate over the proper exit strategy. These considerations suggest that a third strategy, asset sales, may be the preferred approach.

*Interest rate risk*

Banks generally prefer to borrow short term and lend long term, because short-term interest rates (such as the rates banks pay their account depositors) are generally lower than the yield they expect to receive on their longer-term investments and loans (such as mortgages). But the difference between short- and long-term rates can shift dramatically, and this so-called interest rate risk is a concern to banks in the current climate of likely but hard-to-predict tightening of monetary policy.

If the Fed were to pursue either strategy 1 or strategy 2, it too would expose itself to considerable interest rate risk. If interest rates turn out to be higher than now anticipated by markets, either strategy would be quite costly. So while borrowing short and lending long is superficially attractive—since short-term rates are customarily lower—this approach could well end up being quite costly if interest rate volatility requires a sequence of expensive short-term borrowing.

This risk is neither far-fetched nor negligible: Imagine a short-term interest rate of 4 percent on the approximately $1 trillion of excess reserves. This $40 billion cost is greater than the “profits” the Fed now turns over to the Treasury each year.

*Rollover risk*

A second concern is the risk inherent to using short-term claims to fund long-term investments. When long-term investments are backed by shorter-term debts that have to be rolled over—that is, they mature, and the borrower has to seek a new loan—there is real potential that the borrower will not find willing lenders if confidence in that borrower’s creditworthiness has eroded. Such risk is the cause of bank runs, but it affects firms, governments, and central banks as well.

A salient example was seen in March 2008, when Bear Stearns was unable to obtain short-term financing because rumors about liquidity problems began to spread through financial markets and investors lost confidence. Though adequately capitalized by the Fed’s supervisory standards, Bear Stearns nearly collapsed because the liquidity problems became self-fulfilling. Similar problems undermined Lehman Brothers and other firms during the recent crisis. Such rollover risk was not at all anticipated by the experienced financial analysts at these firms, or by the counterparties involved.

Emerging market economies also borrow short and lend long. That is, they have assets that mature over long periods of time and fund them with a sequence of short-term loans. But as seen in Mexico in 1994, for instance, lenders can quickly lose confidence in the ability of a government to manage its economy and refuse to roll over loans made to the nation. For Mexico and other emerging countries, such sovereign debt crises can cause the near collapse of the national economy and threaten international financial stability as well.

The use of strategy 1 or 2 would similarly expose the Fed to rollover risk, in effect, because it amounts to using short-term debts—excess reserves or term deposits—to fund long-term assets. Of course, the Fed differs from private firms and emerging markets in that it can "create" money to finance its debts. And indeed, that ability may well lead to hubris on the part of policymakers—similar to that seen among financial managers in the current crisis who were clearly overconfident in their ability to obtain financing.

Regardless of such self-assurance on the part of policymakers, if market participants lose confidence in the Fed's ability to obtain funds from lenders, the Fed would have to pay very high interest rates to obtain short-term debt. That in itself would constrain monetary policy, and this is the main source of risk from both strategies 1 and 2: A self-fulfilling, high-inflation equilibrium in which *expectations* that the Fed will pursue lax monetary policy because banks demand a high-inflation premium *will lead banks to demand* that high-inflation premium.

**Strategy 3: Gradual sales of financial assets**

Given these potential risks, both acknowledged and largely overlooked, of strategies 1 and 2, a third strategy—the sale of securities now held by the Fed—bears fuller consideration than it has heretofore received.

As of the end of March 2010, the Fed will have purchased $300 billion in Treasury securities, $1.25 trillion of mortgage-backed securities (MBS) guaranteed by federal agencies, and about $175 billion of other agency debt securities. Gradual sales of these assets would decrease the quantity of reserves held by the Fed, because purchasers would draw upon these reserves in making purchases. It would also reduce the overall size of the Fed's balance sheet.

Many observers fret, however, that such asset sales would depress prices of these securities if sales occur over a short period. As *The Economist* put it recently, banks and others "All worry that the eventual sale of these securities could wreak havoc."[9] The housing market in particular could be adversely affected, some fear, if MBS were dumped quickly and mortgage rates jumped. It's notable that in his February 2010 testimony, Chairman Bernanke sought to reassure

[9] *The Economist*, Feb. 27, 2010, "Surf's up."

Congress and the public about such concerns with the explicit statement: "I do not currently anticipate that the Federal Reserve will sell any of its security holdings in the near term."[10]

Given the risks of strategies 1 and 2, however, the potential impact of selling off Fed assets bears closer scrutiny. Would it truly wreak havoc, as many assume? If the Fed manages asset sales judiciously, it is my judgment that such an outcome is highly unlikely.

**How segmented are financial markets?**

The extent to which asset prices would be depressed depends on how segmented financial markets are—that is, how difficult it would be for investors to shift assets from one market to another over a reasonable time frame. Bear in mind that the volume of traded financial assets of all kinds in world markets is on the order of $200 trillion.[11] Given this extremely large financial market, if the Fed were to sell $1 trillion in assets over a period of time, the odds are small that such sales would have a big effect on global financial markets, assuming assets can be shifted among markets with relative ease.

Is it really valid to make this 1-to-200 comparison, that is, to compare the volume of the assets that the Fed holds on its balance sheet—Treasury securities, mortgage-backed securities, and the like—to the entire stock of financial capital? If financial markets are very segmented from one another—in other words, if markets for individual securities are affected very heavily by supply/demand considerations in that specific, narrowly defined market—then such a comparison is not valid.

For instance, it's likely that the market for securities backed by credit card receivables is a distinct market with a small outstanding stock. If so, trades in that market will have a disproportionate effect on prices. But if market participants have the ability to shift holdings across a wide variety of asset types—from mortgage-backed securities to securities backed by credit card receivables, and vice versa, for instance—then the impact on prices in individual markets is going to be muted. "Segmented markets" therefore reflects the notion that markets for financial securities are very narrow and very specific, so supply/demand conditions in that particular market have a huge effect on prices.

How much segmentation truly exists among such markets? If you look at them minute by minute, it's clear that markets are highly segmented; but over longer time horizons, such as two or three years, people clearly have time to shift their portfolios. The question ultimately is, where is that break point where market segmentation ceases to be quantitatively and materially

[10] Bernanke, op. cit, p. 9.

[11] The worldwide stock of bonds, equities and bank assets as of 2008 was $214,424 billion. See http://www.imf.org/External/Pubs/FT/GFSR/2009/02/index.htm#tablesc1.

important? While there is little empirical research on this question with regard to mortgage-backed securities, for instance, it is my judgment that over a reasonable time frame, market participants would be able to absorb the sale of the Fed's security holdings without significant price impact.

**A prudent strategy**

Therefore, it seems prudent to pursue a strategy that centers on a preannounced program of slow but steady sales of long-term government debt and mortgage-backed securities that market participants anticipate will happen over a period of time. Such a program would be unlikely to have a substantially depressing effect on these prices.

Because sales of Fed securities would be gradual during that ongoing divestiture, the Fed may also employ to a limited extent strategies focused on reserve interest rate levels—that is, strategies 1 and 2. Financial markets would understand that the Fed is relying primarily on asset sales to temper inflation, so less attention would be directed to reserve interest rates as signals of monetary policy; and with less reliance on strategies inherently subject to interest rate risk and rollover risk, the Fed would lower its vulnerability to unforeseen financial trends and the hubris that can affect policymakers as well as financial managers.

Such a joint strategy is likely to have the highest probability of success in draining reserves with minimal risk.

Again, it bears emphasis that this debate and the ultimate choice of how the Fed reduces the size of its reserves is not a primary and fundamental macroeconomic issue. While significant, it is not as great a concern as the bailouts and issues of moral hazard raised by past, and possibly future, support for financial institutions deemed too big to fail. Still, policymakers should understand that the debate over the proper method of drawing down monetary reserves as part of the Fed's exit strategy has often overlooked concerns of considerable import and exaggerated risks that should prove minimal if a prudent strategy is wisely implemented.