What Has the Fed Gotten Itself Into?[1]

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Recent events have reminded us that central banks do more than just make set interest rates. From time to time they also have to function as the *lender of last resort* for the financial system, providing "liquidity" to keep a financial crisis from turning into a collapse. The Fed has been serving as such a lender of last resort since late last year, ratcheting up its involvement after the March Bear Stearns crisis, and vastly expanding that involvement after the Lehman was forced to fold. The result has been a massive extension of credit to the private sector, with the Fed assuming powers and risks no one had imagined just a few months ago. We are in the midst of an unprecedented monetary experiment.

The most basic gauge of the Fed's lending efforts is the size of its balance sheet, which has swelled from less than $900 billion to over $2.2 trillion as of last week. And this figure doesn't include its off-balance sheet backstop of Citigroup's troubled assets.

I'd like to do three things in this presentation. The first is to provide some background on the crisis, and the conventional scope of central banks' lender of last resort function. Second, I'll discuss the ways in which the Fed's loans and credit facilities have gone well beyond the traditional LOLR role, with the central bank becoming the last-resort *buyer* of assets, and has even gone to the point of explicitly insuring against default risk. I'll also talk about these measures' effectiveness. And third, I'll raise some questions about what the monetary policy implications of the Fed's assumption of credit risk.

Background

The outlines of the present crisis are by now well known: bursting of the housing bubble created heaps of nonperforming home mortgages, especially those classified as subprime or "Alt-A". These losses hit mortgage-backed securities, knocking the foundation out from under a huge but extraordinarily delicate structure of other assets: CDOs, synthetic CDOs, credit default swaps. These failures led in turn to the collapse of some of the oldest and largest financial institutions in the US: Bear Stearns, Lehman. AIG and Citi are on the edge, propped up by government funding.

The basic story is familiar, at least to students of economic history. Drawing on Minsky, Charles Kindleberger described the progression as follows: (1) displacement, (2) credit expansion, followed by (3) "overtrading"—a mania distinguished by "copycat" speculation. In the present crisis, the displacement (deregulation?) and the role of the Fed (keeping interest rates too low?) are in dispute, but the signs of a mania are unmistakable, at least in retrospect. "There is nothing so disturbing to one's well-being and judgment as to see a friend get rich." "…bringing in segments of the population that are normally

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aloof from such ventures." "When the rest of the world are mad, we must imitate them in some measure." (South Sea bubble.)

Things begin to fall apart with (4) a period of hesitation, when insiders begin to pull out; followed by "(5) revulsion" or "discredit," which leads banks to cease lending on the assets involved in the speculation. That's exactly what happened in 2007 and increasingly as 2008, as investors dumped any asset involving mortgages—and then the assets of any institution that was thought to have anything to do with mortgage-based assets. At that point, as Kindleberger put it, the race out of these assets turns into a stampede.

The lender of last resort to the rescue

This is where the lender of last resort (LOLR) comes in. The classical LOLR function, as articulated by Walter Bagehot in 1873, is to lend at a penalty rate against good collateral. Based on the assumption that the problem is one of liquidity, rather than solvency. Once the panic passes, people will realize that the panic was not justified by fundamentals, and lending will resume. The central bank can provide the necessary liquidity until confidence is restored—and its commitment to do so should in theory ease the crisis. The Bank of England, and other central banks, were compelled to do so repeatedly during the 18th and 19th centuries.

This LOLR function is of course the idea behind many of the steps taken by the Fed in recent months: the creation of eight (at last count) new lending facilities, and several other *ad hoc* extensions of credit. Seth will be talking about some of those facilities in greater detail. Instead, I would like to talk about some of the broader implications of the Fed's increasingly unorthodox measures.

The escalation

Until now, the Fed's exercise of its LOLR powers has been quite limited: e.g., discount-window lending to Continental Illinois, open market operations following the 1987 stock market crash, and the provision of liquidity prior to Y2K and 9/11. The Fed's response to this crisis far exceeds anything it—or any other central bank—has done previously.

The Fed began to expand its LOLR role after the March Bear Stearns collapse, with its extension of credit to primary dealers. (the PDCF). It also made a non-recourse $29 billion loan to Maiden Lane LLC to buy Bear assets that JP Morgan was unwilling to purchase. This step was significant for two reasons: first, it provided assistance to a non-bank financial institution; and second, it required that the Fed assume some nontrivial amount of credit risk.

It made another departure in September with the $85 billion loan to the insurance giant AIG: more risk, an equity stake, assistance to an institution far removed from the banking business.

The Fed then took two more big steps in October: outright purchases of privately-issued securities (via special-purpose vehicles) through the commercial paper funding facility (CPFF) and the money market investor funding facility (MMIFF). The recently-announced term asset-backed security lending facility (TALF) is a similar arrangement, only the Treasury has agreed to absorb the first $20 billion in losses.

These actions raise legal issues involving the Federal Reserve Act, which I won't go into here. But the economic significance is that with these purchases, the Fed has moved well beyond Bagehot's lender of last resort, become the *buyer* of last resort.

Perhaps the Fed's most radical departure from its traditional LOLR role comes from its involvement with the November 30 Citi rescue. The Fed is not doing any actual lending to Citit as part of the deal, and the troubled $306 billion worth of assets will remain on Citi's books. But the Fed, the Treasury and the FDIC have jointly agreed to offer credit protection for those assets. The Treasury and FDIC will absorb $15 billion in losses exceeding $29 billion. The Fed is to make up for any losses in excess of that amount.

The Citi deal has taken the Fed beyond being the lender or even the buyer of last resort: it has now the *risk bearer* of last resort. The Fed, the Treasury and the FDIC have essentially become sellers of credit protection. This is not a new role for the Treasury, which has made loan guarantees before—or for the FDIC, of course. But this is a profound change in the Fed's role.

After this precedent, is it any surprise that Senate banking committee chair Christopher Dodd has asked the Fed to bail out the auto industry?

Has it worked? Will it work?

There are three levels to this question. The narrowest is simply whether Fed lending has kept financial institutions from failing. Clearly it has—after Bear, only Lehman has failed—and the Fed surely could have prevented that failure had it chosen to do so.

A broader statement of the question is whether Fed lending has restored the money markets' normal functioning. In the best-case scenario, a demonstrated willingness to lend would be enough to quell a panic. Knowing that the central bank was willing to lend against good collateral should make potential lenders more willing to accept collateral. The central bank may never need to make a loan.

The best-case scenario clearly has not materialized. The Fed has felt it necessary to extend vast amounts of credit, and the process shows little sign of unwinding.

Looking at interest rate spreads, John Taylor and John Williams have argued that the Fed's lending has failed to restore confidence. Taylor and Williams have a point: no amount of liquidity can offset default risk premia. Spreads have actually *widened* as the Fed's lending has increased. But of course this does not mean that Fed lending has *increased* the interest rate spreads: the volume of lending is an endogenous response to money market stress. Even dates of the new facilities' establishment lines up with onset of episodes of market stress.

The broadest statement of the efficacy question is whether any of the Fed's measures will be enough to reverse the contraction in lending, and revive the economy. Constrained by the zero lower bound on the Fed funds rate, there are two ways in which the extension of credit could get things going again. The first is simply that, by providing time and breathing room, the panic will subside, asset values will recover, and the problem will solve itself. But as the crisis persists, this begins to look more like wishful thinking.

The second is through the increase in reserves and the monetary base: quantitative easing, in other words. If banks are awash in excess reserves, at some point they should, in

theory, start lending out those reserves. The Fed's new policy of paying interest on reserves reduces the incentive to do so, however. In addition, no amount of liquidity will resuscitate lending so long as banks lack capital.

Nor is Japan's experience with quantitative easing encouraging with regard to the efficacy of this channel. The BOJ's six-fold increase in reserves (current account balances) succeeded in flooding the money markets with liquidity and driving the overnight interest rate to zero, but the policy had no discernable effect on bank lending, or even on the broader monetary aggregates.

Credit risk and its implications

The Fed's massive extension of credit has created a number of sticky operational issues, such as how best to retain control over the Federal funds rate when banks are awash in excess reserves. There are also concerns about moral hazard, although these have receded as the severity of the crisis has grown.

Instead, I'll focus on the implications of the Fed's unprecedented assumption of credit risk. Traditionally, the Fed has sought to avoid taking risk onto its balance sheet, and consequently its System Open Market Account (SOMA) portfolio has consisted almost entirely of risk-free Treasury securities.

That has changed drastically since the Fed embarked on its lending spree late last year, although it's hard to say with any certainty how much risk it is exposed to.

Nobody outside the institution knows what assets are on the balance sheet, or how much of a haircut the Fed has taken. And even if they did, determining the assets' fair value in this environment would be difficult.

The Fed's collateralized short-term lending is probably relatively low risk. Other transactions may involve significantly more risk, however. The March purchase of $29 billion in Bear Stearns' assets is one example, and the value of those assets appears already to have fallen by roughly $3 billion. Lacking recourse to the issuing institutions' resources, purchases of CP and asset-backed paper under the CPFF and TALF programs are also inherently riskier.

The off-balance-sheet guarantee of Citi's assets breaks new ground in this regard, as it is structured explicitly as a way to get the Fed to bear default risk.

Given the sheer volume of credit extended by the Fed, and the range of assets purchased or taken as collateral, significant losses are not beyond the realm of possibility. A five percent loss rate would wipe out the $45 billion notional value of the Fed's capital.

What happens if the Fed were to become insolvent? The short answer is nothing. It's not like there's going to be a run on the central bank, with people lining up to get their money. The Fed can give out as much money as people want. Still, there could be negative consequences: inflation and loss of independence.

The problem with loan losses is that they have to be financed somehow. If the value of the Fed's financial assets were to fall by $100 billion, for example, something else on the balance sheet would have to change to make up for the shortfall.

One way to make the books balance is through seigniorage—exchanging currency and reserves for (ex post) worthless assets is equivalent to Friedman's famous helicopter drop. Hence, a Fed-financed bailout could eventually have inflationary consequences.

There is no reason to believe that a debt-financed bailout would be inflationary—at least so long as the Treasury is expected increase its by future tax receipts in order to satisfy its intertemporal budget constraint. To reduce the risk of inflation, therefore, Treasury debt must somehow be substituted for the Fed's monetary liabilities. And one way to do this is through a recapitalization of the central bank.

A recapitalization is essentially an operation in which the Treasury gives the central bank assets consisting of Treasury debt, receiving in return an equity stake in the central bank. In isolation, this has no effect on the government's *consolidated* balance sheet, and hence should have no economic effect. But if the central bank then uses the Treasuries to sterilize the issuance of its monetary liabilities, the net effect will have been to replace money with government debt. If "backed" by future tax revenues, the inflationary consequences will be reduced.

These observations put an interesting spin on two of the Fed's new TALF facility, and its default risk protection deal with Citigroup. Recall that in these instances, the Treasury and FDIC absorb the first tranche of losses, with the Fed on the line for losses in excess of the Treasury's commitment. I might be reading too much into it, but this structure suggest an intention to use non-inflationary debt-financed means to finance bailouts up to a point, shifting to seigniorage in the event of very large losses. You could call it *contingent monetization*. Perhaps the thinking is that if things get really bad some inflation might not be a bad idea. In other words, this could be a way "to commit to being irresponsible," in Krugman's memorable phrase.

Another reason central banks may wish to avoid capital losses is the perceived loss of independence this might entail. Although a consolidated balance sheet is a useful description of the economic relationship between the central bank and the Treasury, In a 2004 speech, Kazuo Ueda, then a member of the BOJ's policy board, dismissed this conception as "naïve." In his view, significant losses would change the balance of power between the government and the central bank and make the bank susceptible to government interference. If so, then inflationary finance would be less of a problem than the imposition of the government's preferences on the central bank. This could result in higher inflation if the government pressured the central bank to target an unrealistically high level of economic activity.

There are at least three reasons to be concerned that losses could jeopardize central bank independence. First, the reallocation of the bank's portfolio towards assets that subsequently defaulted would result in a loss of income—funds that are normally turned back over to the government. A significant decline in those revenues could therefore have political ramifications, and possibly give the Treasury more leverage over the central bank. This problem would be especially acute in the unlikely event that the banks' revenues were insufficient to meet the institution's operating budget. In this case the bank would have to appeal to the Treasury for funding through the budgetary process, and this would undoubtedly entail messy negotiations.

Second, the central bank's *de facto* fiscal expenditures could be interpreted as the central bank doing the Treasury's bidding, effectively monetizing a government bailout of the private sector. Such a perception is understandable, as the central bank's purchases of worthless assets would be equivalent to (in terms of the impact on the consolidated balance sheet) the Treasury's issuance of bonds to finance the purchase of the assets, accompanied by the central bank's issuance of money to purchase of the government bonds.

Third, this central bank's purchase of assets that subsequently lost value will inevitably be perceived as an *ex post* bailout of the institutions from which it purchased the assets. Such a transaction would surely raise questions about the central bank's accountability, as it represents an expenditure not appropriated through the normal political process. In some cases, as in the $29 billion asset purchase that cleared the way for JP Morgan to buy Bear Stearns, the Fed's actions are perceived to be benefiting specific institutions. As former Fed governor Alan Blinder put it, "People at the Fed from Bernanke on down are not very happy about having had to commit so much taxpayer money on their own rather than have Congress or the executive branch commit it."

Criticism of the Fed's lack of transparency and accountability is beginning to mount. Bloomberg News has filed a lawsuit under the Freedom of Information act, demanding disclosure of the identities of the borrowers, and the assets pledged as collateral, and Bernanke has faced pointed questions on the matter in congressional hearings. Bernanke's rationale for not disclosing borrowers' identities is that doing so would raise questions about the borrowing institutions' creditworthiness. More puzzling is the Fed's reluctance to publish lists of the securities accepted as collateral.

Finally, a major loss or insolvency on the part of the central bank may be damaging for the simple reason of public embarrassment. While impossible to quantify, many central banks enjoy a reputation for technocratic competence and integrity that could be undermined by the perception that it lost money on foolish investments.

Other central banks' experiences with losses and insolvency

These issues are not theoretical curiosities. In the past decade, a surprising number of emerging-market central banks have experienced significant losses, and some have become technically insolvent. The reasons for the losses vary. The majority result from foreign exchange intervention, typically associated with attempts to peg the exchange rate and sterilize inflows of foreign-currency denominated assets However there are at least two cases in which the losses stem from the central bank's effort to stabilize the banking system during a financial crisis. Interestingly, not all of the losses—even in cases of technical insolvency—were recapitalized.

The sample is too small, and the experiences too diverse, to draw firm conclusions about the economic implications of these central banks' losses. There is at least no *prima facie* evidence that losses cause dire economic consequences, such as runaway inflation. Among the handful of cases I have examined, in two cases (Brazil and Hungary) in which the central bank was recapitalized, and in three cases (Chile, the Czech Republic, and Thailand) in which it was not.

The charts reveal no clear tendency for inflation to rise following the realization of the losses. In fact, for every country but Thailand, the downward inflation trend continued unabated despite the deterioration of the central banks' balance sheets. The role of recapitalization is not clear, at least based on these five countries: inflation remained under control in both Chile and the Czech republic, whose central banks were not recapitalized, while Thailand experienced a surge in the year inflation following its losses. The central bank's statutory independence may also be a factor in determining the behavior of inflation. Using the criteria Adam Posen and I have used in previous studies, neither the Hungarian nor the Thai central bank would have been classified as autonomous during these episodes. A reasonable conjecture is that inflation is a problem primarily for those central banks that were not recapitalized *and* lacked clear statutory independence.

Conclusion

The Fed's LOLR role in the panic of 2008 has changed almost beyond recognition. It began as a conventional lender of last resort, following Bagehot's advice of lending at a penalty rate against good collateral.

But as the breakdown in financial intermediation intensified, the Fed has found itself as *buyer* of last resort for several classes of assets, notably commercial paper, asset-backed securities of various types, and GSE debt. And with the Citigroup rescue, the Fed has become the *risk-taker* of last resort, agreeing to limit Citi's losses on a $300 billion portfolio of troubled assets.

All this raises interesting and troubling policy issues. Will the Fed's interventions work? Will its active role in the bailouts compromise its independence? Will loan losses, should they occur, generate inflation? Nobody knows. But our friends at the Fed should be commended for their "Rooseveltian resolve," to use Bernanke's own phrase, in fighting the crisis—*and* for giving us the most spectacular policy experiment in generations.