Exit Strategies and the Federal Reserve

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Quite a few remarkable changes took place in the United States economy in the final years of the 2000s. House prices fell more and faster than in the last one hundred years, seemingly powerful banks closed their doors forever, and the economy went into the largest recession since the Great Depression These and other changes were amply dissected by the media. But one other change went largely unnoticed by the general public: the Federal Reserve System and the conduct of US monetary policy changed more in the last two years of the 2000s than perhaps any other time since the system's inception in 1913.

The Fed, as it is commonly called, has for most of its history limited its actions to buying and selling government bonds from a select group of banks in exchange for money that it puts into circulation. It has also lent money to a few banks directly, for short periods of time and against sound collateral, and has bought and sold some gold and foreign currencies. In 2008-09, the Fed extended its reach in ways that few had imagined before. It made loans to a myriad of institutions, started buying securities directly like a regular investor, and found itself supporting failed companies like Bear Sterns and American International Group (AIG). While discussions about the Fed had before only referred to the state of the economy and the odds of a recession, since then there have been questions about the state of the Fed's balance sheet and the odds it could suffer heavy losses in its investments. While the Fed still sets interest rates, the news about the Fed is now more often about discussions in Congress about its powers, or the successes and failures of its latest credit programs.

For the most part, these changes were not planned well in advance. They did not follow long debates, with arguments discussed in numerous conferences and opposing views put forward in the public arena. This is perhaps why most people have not realized that something has changed. Rather, the Fed has been forced to react and adapt to the unusual circumstances of a financial crisis that few had anticipated.

The goal of this chapter is to look forward to how the Fed should proceed in the future. It starts with a brief review of the main changes before turning to three main questions. First, what are the dangers of the current situation? There are both economic and political concerns, namely the potential tradeoff between controlling inflation and economic stability, and the role of the Fed within the US government. Second, can the Fed get back to its traditional role? A catchphrase for the discussion of the future of monetary policy has been "exit strategies," referring to the ways in which the Fed could return to its customary state of affairs. This chapter discusses the viability of these strategies. Finally, should the Fed revert back to this customary state? Some of these changes may have been desirable even without a crisis. Now that the Fed has them, it may be a good idea to keep them.

Extraordinary Times

At the most basic level, a central bank is the sole entity that can put currency into circulation and set minimum requirements for the amount of reserves other banks must hold. While there are many definitions of money, one that is both simple to understand and that the Fed controls well is the sum of currency in circulation and the reserves that banks hold, mostly in deposits at the Fed. This is called the monetary base.

In December 2007, the monetary base was $836 billion, approximately 6 percent of annual gross domestic product (GDP) that year. By December 2009, the monetary base had grown to $2,026 billion, about 14 percent of that year's GDP. This 142 percent increase in the monetary base is especially shocking, given that the average two-year increase in the monetary base between 1959 and 2007 was 13 percent, and the highest-ever increase was 24 percent. This change was also not short lived: in April of 2012, the monetary base was $2,640 billion. There is more money in the US economy than ever before, and it has grown many times faster than it ever had.

There is another measure of money, M1, which equals currency in circulation plus checking deposits. This matches more closely what people in their everyday lives think of as money. If banks were required to keep as reserves all of their deposits, sometimes called full-reserve banking, then M1 and the monetary base would be the same. Instead, banks can use the deposits to make loans, keeping only a fraction as reserves. In this world of fractional reserve banking, bank loans are deposited by other people, leading to M1 exceeding the monetary base. The ratio between the two is called the money multiplier.

Looking at the data on M1, it was equal to $1,395 billion in December 2007. Two years later, it had risen to $1,724 billion. While impressive, this increase is considerably smaller than the increase in the monetary base. This contrast uncovers the main reason for the increase in the base: a rise in the reserves held by banks. The money multiplier has fallen, or in other words, banks have been making fewer loans preferring to keep their customers' deposits stored inside the Fed's vault. These two events, the rapid increase in the monetary base and the large decline in the money multiplier, have not occurred in this magnitude at any time in the last fifty years.

Most people identify the Fed not with money but with interest rates. Since the early 1990s, the Fed has been publicly announcing targets for the federal funds rate, the interest rate in the federal funds market, where a select group of banks lends money to each other overnight. How can the Fed set a market price like an interest rate? By using its ability to issue money to buy and sell government bonds from some of these banks in exchange for crediting the reserve accounts of these banks at the Fed, it seamlessly controls the demand for money in the federal funds market, thereby effectively controlling the interest rate. These are called open-market operations, and because the buying and selling of government bonds takes place every day, the Fed only interacts with a small group of nineteen banks. These banks are sufficiently large and credible, so the Fed need not worry about having these transactions honored.

Looking at the target for the federal funds rate, available since December 1982, interest rates are now lower than they had ever been. From December 2008 onward, the Fed has been announcing that it is targeting a value for the federal funds rate between zero and 0.25 percent, and, as of April of 2012, the Fed continues to keep the rate at this low value. Zero is not just the lowest the interest rate has been, it is also approximately the lowest it can be. If the interest rate is negative, banks would prefer to hold on to the

reserves rather than lend them to other banks, and people in turn would prefer to hold cash in their pockets rather than pay a bank to hold them. The interest rate can be slightly negative, as keeping money in one's pocket may be inconvenient and there is a chance it can be stolen or lost, but there is still a lower bound on interest rates, which is plausibly quite close to zero.

There has been another significant change in the Fed's policy regarding interest rates. Starting in October 2008, the Fed began paying interest on the reserves that banks deposit at the Fed. The expense that this involves has been small, given that the interest rate set by the Fed has been only 0.25 percent since December 2008. But paying interest on reserves is an entirely new tool at the disposal of the Federal Reserve, one that it never had before.

Of all these changes, perhaps the most remarkable is the composition of the Fed's assets. Since the end of the Bretton Woods system, the Fed has traditionally held mostly US Treasuries that it can use in its open-market operations. The only other relevant assets are small amounts of gold and foreign currency. As a result, the Fed's balance sheet has traditionally taken less than one page, changing little from year to year. The only relevant default risk in this balance sheet has been the remote chance that the US treasury defaults on its debt.

Since 2007, the balance sheet has expanded to many pages, including multiple assets with different default risks and a myriad of financial firms on which the Fed now has credits. Some of these changes have come through a menu of different liquidity programs that the Fed introduced in 2007 and 2008, dealing with new financial institutions in forms never tried before. The most conservative is the Term Auction Facility (TAF), through which the Fed now lends to a wider set of banking institutions providing credit for twenty-eight or eighty-four days, with terms determined by auction. Because this credit is given against high-quality collateral, the risk default is low. Its desirability stems from the fact that banks have access to funding for longer than just overnight. Slightly more distant from the Fed's usual actions is the Term Structure Lending Facility (TSLF) and the Primary Dealer Credit Facility, through which the Fed also gives credit overnight and at twenty-eight days against collateral, but to primary dealers of securities. The third set of programs extended credit to even more financial firms, many of which had never engaged in transactions with the Fed. This was composed of the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility and the Money Market Investor Funding Facility, where credit is provided to money market funds. Finally, the Fed entered a series of swap agreements with foreign central banks, through which it exchanged dollars for their currency, with a promise to receive the dollars back in a short period of time.

The next set of liquidity programs was more out of line with the tradition of the Fed. Through the Term Asset-Backed Securities Loan Facility, the Fed lent widely, accepting as collateral any asset-backed security as long as it was rated AAA and backed by student, auto, credit card, and small business loans. For commercial standards, the default risk is small, but, by the Fed's standards of traditionally accepting nothing but Treasury securities for collateral, the risk is quite high. The final liquidity facility is the Commercial Paper Funding Facility, through which the Fed is willing to lend against commercial bonds issued by companies that had trouble selling them to private agents in the markets. De facto, the Fed started providing credit to some US nonfinancial firms.

Most of these programs were terminated by 2010, or are very close to having zero balances by 2012. Their legacy for the future is the precedent that, if there is another financial crisis, the arsenal of tools at the Fed's disposal is now much wider.

Beyond these loans, the Fed also started buying assets directly. The first innovation was the purchase of mortgage-backed securities (MBS), in an attempt to provide some demand in a market that has been deeply affected by the financial crisis and prevent a rise in mortgage rates. The second innovation was the creation of a series of corporations (Maiden Lane LLCs) that purchased assets from Bear Sterns and AIG, as part of the government bailout of these companies. The Fed also made loans to Citigroup and Bank of America, although these have been repaid for the most part.

Finally, since 2009, the Fed bought large amounts of agency debt guaranteed by the Unites States government, notably debt issued by Fannie Mae and Freddie Mac, as well as longer-term government bonds. By holding these long-term bonds, the Fed's plans for interest rate for the next few years now have a direct impact on the value of the assets the Fed holds.

All of these programs combined means that the Fed's balance sheet is radically different than it was at the stat of 2007, before the financial crisis. The Fed went from dealing with only a few banks, and facing almost no risk in its mostly government assets, to making loans to and buying assets from a myriad of different private agents, with different risks associated both with changes in the price of these assets as well as with possible defaults on the loans. Whereas before the crisis, the large majority of the Fed's assets were short-term government bonds, as of April of 2012, these accounted for less than 5% of its assets. By 2012, most liquidity programs and loans have ended, and the bulk of the Fed's assets are mortgage-backed securities, agency debt, and government bonds, all of medium or long maturities.

These three changes—an increase in the amount of liquidity, historically low interest rates, and a whole new set of Fed investments—illustrate that while the Fed's buildings and staff remain largely unchanged, its role in the economy has changed dramatically. Is this dangerous, and if so, in what way? How can the Fed get back to its old mode of operations, or should it keep some of these innovations? These questions will be tackled next.

What Are the Dangers of the Current Situation?

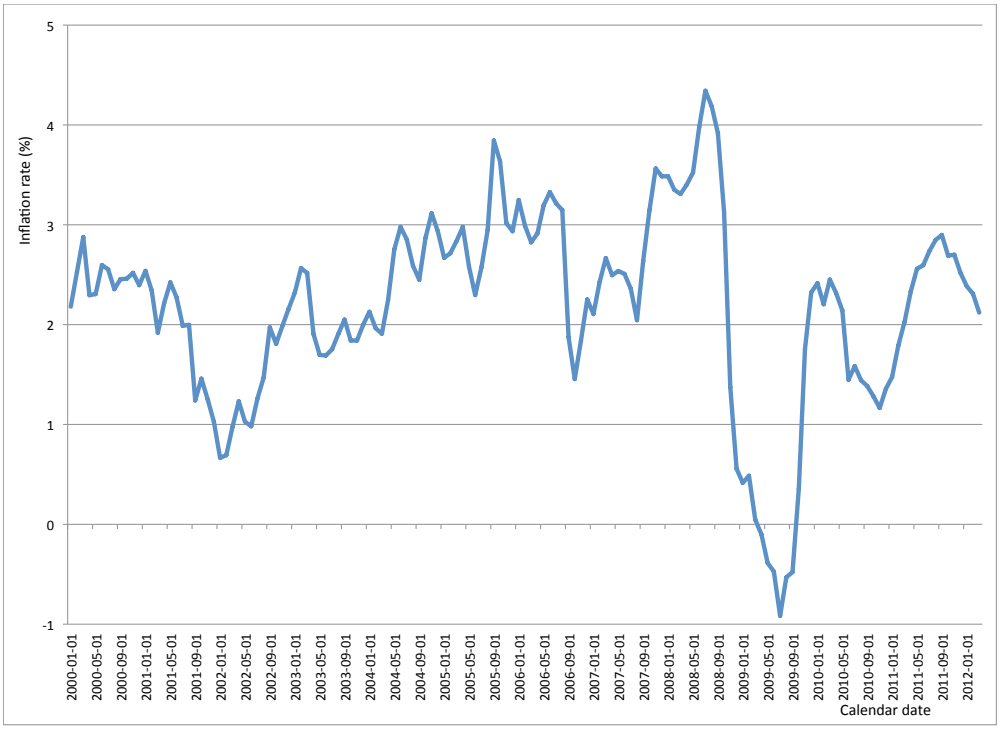
The Federal Reserve's mandate, as determined by law, is "to promote effectively the goals of maximum employment, stable prices and moderate long-term interest rates." Because it is conventionally understood that the third of these goals follows if the first two are achieved, this law is often referred to as the dual mandate. In the current context, this mandate begs the question: what are the dangers of these changes to the Fed's procedures when it comes to inflation and employment in the present and next few years?

The Dangers for Inflation. A powerful strand of economic thought, called monetarism, links inflation to the growth rate of money. Milton Friedman famously said that "inflation is always and everywhere a monetary phenomenon." Looking at the evolution of the monetary base should provide some insights on what will happen to inflation. This is indeed the simple model that undergraduates in macroeconomics still learn. With the

monetary base rising faster than it ever has, a naïve application of monetarism would lead to expecting unprecedentedly high inflation, well into the double digits.

However, figure 1 shows year-on-year inflation since January 2000. In this ten-year period, inflation rose slightly until it peaked in 2008 a little above 4 percent; it then fell sharply to the neighborhood of zero in 2009 and has not exceeded 3% since. But one might ask, "What about future inflation?" Instead of offering one particular, and surely flawed, prediction of the future, one can look at surveys for what economists think. While only a few surveys of expected inflation more than a few years out exist, one of the most used is the Survey of Professional Forecasters, which provides inflation forecasts for the next five and ten years. According to the numbers released in May 2012 surveying forty-one forecasters, the median forecast is 2.35 percent for 2012 through 2016 and 2.48 percent for 2012 through 2021.[1] In November 2007, just as the crisis was starting, these forecasts were 2.5 percent and 2.4 percent respectively. There is little evidence that inflation is getting out of hand.

Figure 1
Year-on-Year Inflation since January 2000 for Personal Consumption Expenditures



Source: Author's calculations, Federal Reserve Economic Data (FRED), Federal Reserve Bank of Saint Louis, Personal Consumption Expenditures, Chain-Type Price Index (PCEPI)

[1] Survey of Professional Forecasters 2009, Quarter 4 Release, Federal Reserve Bank of Philadelphia, November 16, 2009, http://www.phil.frb.org/research-and-data/real-time-center/survey-of-professional-forecasters/.

This apparent disconnect between theory and reality arises because the aforementioned theory was too naïve and flawed to apply to current times. A more sophisticated application of monetarism suggests that linking the growth rate of the monetary base to inflation relies on two pillars. The first is that the money multiplier is stable. Then, and only then, does an increase in the monetary base track an increase in M1. The second pillar is a stable relationship between interest rates and the amount of money people want to hold, so that there is a link between M1 and the price of goods. Both of these pillars fail when nominal interest rates are zero as they have been in the United States.

The money multiplier breaks down because at a zero percent interest rate, banks are indifferent between holding new printings of money as excess reserves and lending them out. Whereas with positive interest rates, banks want to hold as few reserves as possible and usually hold only the minimum legal requirements, a zero percent interest rate involves banks holding large reserves. Therefore, an increase in the monetary base does not imply an increase in M1, and the money multiplier falls. While the monetary base has increased at an extraordinary rate, the growth rate of M1 during the recession, while high on average, is not so out of line with what was seen in 1987, 1993, or in 2001–2003.

The relationship between interest rates and money demand also breaks down because at a zero interest rate, people are not rushing to exchange any extra money for goods. When someone decides to hold money, the loss is the foregone interest that could have been earned by buying a bond. With a positive nominal, fixed interest rate, an increase in the amount of M1 must come with an increase in prices of similar proportion so the real amount of money held by people is still in line with the interest rate. In other words, if there is more money in the system, but the same number of goods being produced and motivating the desire to hold money, then the price of these goods in dollars must go up. But when the nominal interest rate is zero, people are happy to hold as much money in the bank as there is out there, as long as it is enough for them to engage in their transactions. There is no new demand for goods, and therefore no reason to expect inflation.

If, with a zero nominal interest rate, the monetary base is no longer a reliable signal of the evolution of inflation, then what takes its place? A related theory of what determines inflation that works more reliably at a zero nominal interest rate looks not at money but at nominal interest rates directly. As with the monetarist theory, it is based on two pillars. The first is the Fisher equation, named after the late economist Irving Fisher. It states that the interest rate is equal to inflation plus a real interest rate, which is higher when consumption is growing faster. The second pillar is the premise that the central bank chooses to target the nominal interest rate with an aggressive response to inflation, increasing the federal funds rate by more than one if inflation goes up by 1 percent. Most evidence seems to show that this has been the case for the last twenty-five years in the United States, and this policy has received the name the “Taylor principle,” after economist John B. Taylor.

Combining these two premises leads to the conclusion that inflation is determined by a weighted average of current and future interest rates as well as current and future economic growth. If the economy is expected to go into a deep recession, real interest

rates are pushed down, which for a given nominal interest rate pushes down inflation. Alternatively, lowering nominal interest rates below what the rate of inflation justifies according to the usual policy choice has the effect of raising inflation.

This theory provides a different interpretation of recent events. A deep recession pushed inflation down, to the point where, without intervention by the Fed, US consumers might have seen prices falling. The Fed lowered the federal funds rate as low as it could, all the way down to zero, trying to push inflation up. This has not been enough to offset the effect of the recession on inflation, so the United States has experienced lower-than-usual inflation, in spite of the aggressive monetary expansion.

What about the risk of future inflation? It depends mostly on what happens to interest rates in the future. There are no signs that the Fed will keep interest rates this low for longer than absolutely necessary. As soon as a recovery in the economy gets underway and inflation gives signs of picking up, raising interest rates would be enough to keep inflation under control. According to this theory, the present situation only brings dangers to inflation insofar as the Fed will be too slow to act in the future. Otherwise, there is no reason to expect an increase in inflation.

The Danger for Employment. The danger for employment is clear: that the United States may slip into a depression as in the 1930s. Thus, it is helpful to start by comparing the 2007-09 recession with the 1981−83 recession, previously the largest recession in the postwar United States, as well as with the first few years of the Great Depression. Figure 2 plots the unemployment rate in the United States since December 2007, when the recession officially started, together with the same measure starting in July 1981, as well as unemployment during the start of the Great Depression using circles to represent the available annual data. The figures show the data until four years after the peak of the business cycle, therefore including some of the recovery.

The recession of 2007-09 is clearly visible. Both in level and in the rate of change, unemployment was as bad, or worse, than anything the country had seen in the postwar period. The recovery and fall in the unemployment rate has also been painfully slow. Still, the United States is far from the catastrophic events of the Great Depression. As exceptionally bad as times are, the last recession did not spiral into a depression.

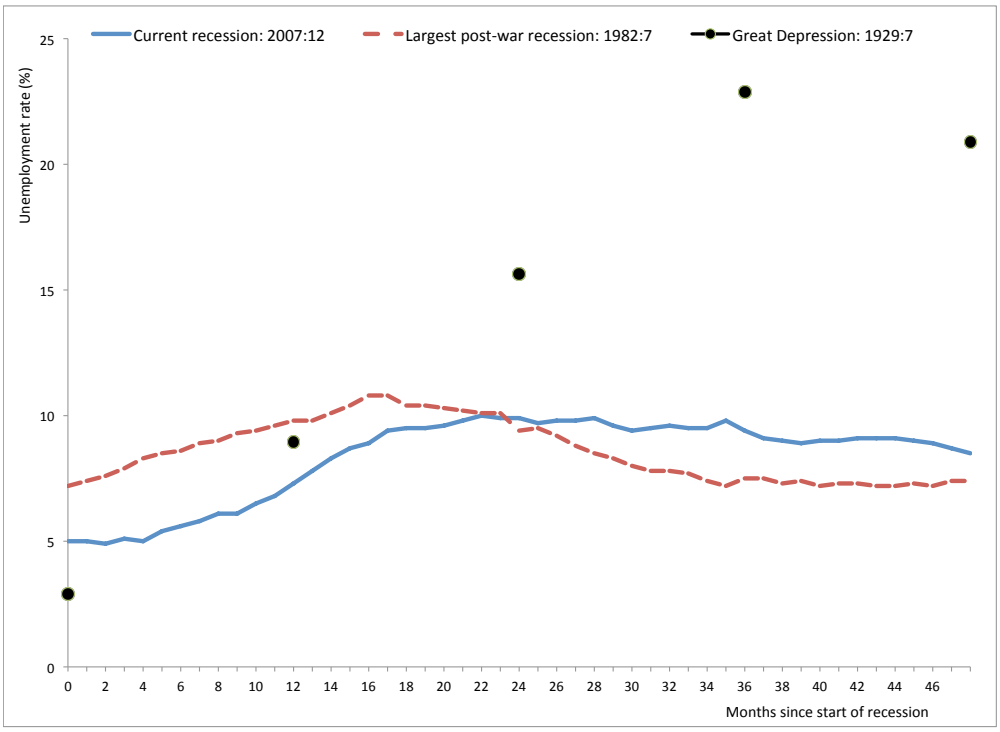
Whether this was caused by the financial crisis, by events in the real economy, or by a third factor perhaps causing both is not the point of this chapter. The goal is instead to understand what the Federal Reserve can do to stop this increase in unemployment.

Conventional wisdom says that lowering nominal interest rates, or printing money, is the answer. The lower return on savings that this monetary stimulus induces would encourage people to increase the demand for goods today, boosting production and employment. However, the interest rate is already at zero: it cannot go down any further.

The danger is that even a zero nominal interest rate may not be enough. To see why, recall the Fisher equation stating that nominal interest rates equal real interest rates plus expected inflation. Imagine now that the crisis in the US economy is so serious that it would take significantly negative real interest rates to stimulate spending. If inflation expectations are sticky at around 2 percent, as the surveys seem to show, then lowering nominal interest rates to their lower bound of zero will at best generate slightly negative real interest rates. In this case, even though they are already negative, real interest rates are still too high, and thus employment is too low, relative to what may be desirable.

Figure 2

The Three Main Recessions of the Last One Hundred Years: 2007-09, 1981-83, and the Great Depression



Source: FRED, Federal Reserve Bank of St. Louis; Historical Statistics of the United States, millennial edition, unemployment during the Great Depression, series ba475, available at hsus.cambridge.org

By driving the nominal interest rate to zero, is the Fed already doing all it can to combat unemployment? In theory, no, since raising inflation expectations would lower the real interest rate and stimulate the economy. Since, ultimately, the Fed affects inflation by setting nominal interest rates, the arguments of the previous section suggest that if the Fed were able to credibly commit to keeping nominal interest rates at zero for a prolonged period of time it should be able to raise inflation expectations. The Fed's policy announcements have been clear that it will do all it can to prevent inflation from becoming negative, including keeping nominal interest res at zero for as long as it takes. It therefore seems that, at least according to theory, the Fed is trying to minimize the employment risks as far as it can.

Another way of stating this commitment to lower nominal interest rates for a prolonged period of time is to try to lower long-term nominal interest rates today. The Fed has also moved in this direction by shifting the composition of the Treasury securities it holds from short-term Treasury bills to long-term Treasury bonds. Buying

Treasury bonds may raise their price and lower their return, but more importantly it provides a signal of the commitment to keep interest rates low in the future.

The Danger to the Fed's Independence. Whereas the dangers for employment and inflation were related to the novelties in interest-rate and money-supply policies, the danger for the Fed's independence is mostly tied to the new assets on the Fed's balance sheet. It is a less direct but potentially more long-lasting challenge.

The motivation for the several liquidity programs was to promote financial stability. While this is not explicitly an objective of the Fed, there is a presumption (justified by the Great Depression) that financial instability can turn a recession into a depression. The Fed lent to different financial agents and bought assets in different financial markets usually with the goal of keeping those markets operating and ensuring that the financial system as a whole was still reallocating funds from lenders to borrowers.

While almost all of these programs had been terminated by 2012, this venture into unfamiliar territory comes with two great dangers looking forward. By interfering in many domains that were previously under the sole oversight of Congress and the Treasury, the Fed has raised questions regarding its independence relative to these bodies. The Fed is an independent entity, though it is governed by the rules put forth by Congress. Given the goals set by the Federal Reserve Act, it has the autonomy to set monetary policy in whatever way leads to stable inflation and employment, without any direction from the president or interference from Congress. The Fed manages its own budget and is only directly influenced by Congress and the president at the time of the appointment of the governors of the Federal Reserve.

One of the great lessons in the study of central banking in the last twenty years is that independent central banks can achieve both lower inflation and more economic stability. This has been confirmed by several empirical studies and has found support in theories that partly gave a Nobel Prize to Finn Kydland and Edward Prescott. An independent central bank is able to resist pressure from the government to print a little more money either to pay for government debts or to slightly increase employment. Because markets and people realize this, independent central banks are more credible and lead to lower inflation expectations and interest rates, as well as more stable employment.

However, these virtues of central bank independence applied to the old regime, in which the Fed kept its job narrowly constricted to putting money into circulation and buying and selling marginal amounts in the deep Treasury securities market. Once the Fed started intervening in many other markets, this raises legitimate questions as to how these markets were chosen, and within them, why some securities were purchased instead of others. More to the extreme, participating in the bailout of some financial companies like AIG and Bear Sterns, but not others, sometimes in close cooperation with the Treasury, raises the issue of using public money without congressional approval in a stretched interpretation of the Fed's mandate.

A related danger of congressional interference in the conduct of monetary policy is that, by taking on risky assets, the Fed incurs losses. This is particularly worrying for the assets in Maiden Lane associated with Bear Sterns and AIG, as well as for the MBS. In normal times, the risk of any losses in Treasury security holdings is small. Since it collects some seigniorage revenues from issuing money, the Fed usually has more than enough funds to run its operations and is still left with enough funds to remit to the

Treasury. But if the Fed suffers a substantial loss, it may find itself without funds to pay its bills. Two potential sources of funds would be to sell some of these assets or to issue reserves. If both of them are incompatible with the employment and inflation goals of the Fed, the only other alternative is to ask for funds from Congress. Once this happens, it is only a small step for Congress to start conditioning how monetary policy is conducted, effectively ending the independence of the Fed.

The chance that the Fed suffers such large losses that it needs to turn to Congress for funds is still remote. Yet, the possibility has already emboldened members of Congress to attack the Federal Reserve Act and remove some of the Fed's independence that has had such beneficial effects over the past few decades.

It is important to emphasize that, given what is known today, there is no reason to doubt that the Fed has done nothing but pursue financial stability and general welfare in the US economy. The Fed has been more transparent than most government agencies, explaining carefully the rationale behind most of its actions, in spite of the confidentiality constraints that come with some of its loans. Moreover, given how quickly events took place in the financial markets, the Fed was often the only agent of the US government that could respond, even if in an ideal, better-designed regulatory system, a branch of government would have stepped in.

The final danger to the Fed's independence is subtler and more remote, but still one to bear in mind. By engaging in financing relations with so many financial institutions, the Fed has become an important agent in many markets, and has opened the door for future interventions. Financial-market participants now have available a strategy that they did not have two years ago: to lobby the Fed to intervene and cover their losses. When the Fed dealt only with banks, and heavily regulated them in exchange for rare interventions, this problem may have been under control. Once the Fed entered into credit transactions with so many other financial firms, the resulting moral hazards cracked the natural barrier preventing them from trying to steer policy in ways that are privately profitable but socially costly.

Can the Federal Reserve Get Back to Its Usual, Precrisis, Role?

Regarding interest rates, the answer is a clear yes. Nothing prevents the Fed from raising its target for the federal funds interest rate. Likewise, even though the Fed now has the power to pay interest on reserves, it has full freedom to set the rate of interest at whatever level it chooses, including zero forever. Returning to the precrisis policy regime regarding interest rates would be easy.

Reversing the more than doubling of the monetary base would be a little harder, although it still falls within the normal set of actions used by the Fed. If the federal funds rate rises above the interest rate paid on reserves, banks would again face a cost of holding money on reserves. The money multiplier would go back to normal, and as banks tried to unload their excess reserves, the Fed could stand ready to absorb it by giving them government bonds in return. Standard open-market operations, the bread and butter of the Fed's activities, should naturally take care of lowering the amount of money in circulation.

Turning to the assets of the Fed, the multiple liquidity programs (TAF, TSLF, etc.) consisted of loans with durations of at most three months. By simply letting them expire,

the Fed was able to eliminate them almost entirely by 2010. The terms at which these loans were made were quite onerous for the borrowers. Once credit conditions returned to normal, they were glad to let them go.

Reversing the maturity of the Treasury securities it holds would not be difficult. The Fed could simply sell the Treasury bonds it holds and use the proceeds to buy Treasury bills. This could be accomplished in a few weeks. The markets for these securities are sufficiently liquid that, if done in an orderly fashion, this would have a small impact on their operation. It may cause some challenges for the Treasury in managing the desired maturity of outstanding public debt, but there is no reason why they would not be able to deal with these challenges. This change does not even need to affect private holdings of government securities, since if the Treasury does the reserve purchases and sales, the operation becomes just a matter of accounting between these government and semipublic entities.

So far, reversing the changes of the past two years does not seem particularly hard. More complicated is the sale of the $858 billion of MBS held by the Fed.[2] This action was motivated by the contraction in demand for these securities during the financial crisis, perhaps as a result of the fall in prices in the housing market and the deterioration of the finances of households with mortgages due to the economic crisis. The Fed acted to prevent increases in mortgage rates, or even at points in the financial crisis, to offset the near absence of MBS financing for new mortgages in the housing market. Unlike the liquidity programs, which have gradually unwound, the holdings of MBS have been stable since 2010, and in May 2012 accounted for about 30 percent of all the assets held by the Fed.

To reduce its MBS holdings, the Fed could just hold them and collect their payments until they mature. However, this could take many years: while the Fed has not revealed the maturity of its portfolio of MBS, if it resembles the maturity of securities outstanding in the market, it is more than just a few years. Moreover, the value of the MBS will fluctuate over time, exposing the Fed to considerable financial risk.

Alternatively, the Fed could gradually sell these securities, as the market for housing recovers and the private demand for MBS reappears. There are two difficulties with this strategy. First, it is unclear that the Fed would be the best "market timer" at selling its positions, so again there is a risk of incurring unexpected losses. Moreover, with the Fed as such a large holder of these securities, it may start paying for speculators to try to time the Fed itself. Many central banks around the world have faced these challenges in the last thirty years in another market, as they tried to reduce their holdings of gold, and have learned from this experience that doing it well requires time and patience.

A second difficulty with selling the portfolio of MBS goes back to the Fed's independence. The Fed's holdings are approximately 10 percent of the outstanding amount in this market—not a small deal, especially as mortgages have a high political visibility and the issuers of these MBS are Fannie Mae, Freddie Mac, and Ginnie Mae, government-sponsored enterprises that have for decades relied on support and implicit guarantees from Washington. The Fed may again come against political pressure in the

[2] As of May 16, 2012, from the Factors Affecting Reserve Balances (H.4.1). Board of Governors of the Federal Reserve.

management of its MBS that diverts its focus from the dual mandate and jeopardizes its independence.

Should the Federal Reserve Get Back to Its Old Ways?

Having discussed how the Fed could undo the many changes since the financial crisis, this section turns to the question of whether it should do so. Starting with the changes in the Fed's assets, there is no compelling reason why the support of AIG and Bear Sterns, the holdings of MBS, or the many short-term liquidity programs should be continued. These actions are justified in response to the financial and credit crisis. Once these crises are gone, however, there is no reason to keep them. Moreover, as was already discussed, these assets come with the danger of capture by financial participants, and they may lead the Fed to lose focus from its dual mandate of maximum employment and price stability. Finally, by intervening directly in some financial markets for a prolonged period of time, the Fed would inevitably be interfering with the incentives in those markets in ways that are not justified by its mandate and would not lead to any clear gain in efficiency. Going back to a boring Fed balance sheet, with Treasury securities as the main item on the asset side, may be best.

There is one exception to this broad conclusion: the TAF. This liquidity program extends the actions of the Fed from the small set of primary dealer banks to potentially many more banking institutions. Instead of only buying and selling Treasury securities from them, the Fed can lend to banks for twenty-eight or eight-four days at terms determined by auction. This is one extra useful tool at the disposal of the Fed in conducting "plain vanilla" monetary policy. Indeed, many central banks, including the European Central Bank, have had similar mechanisms in place for some time. It provides one way for the Fed to inject liquidity quickly into the banking sector and to obtain valuable information from the market price at which the auctions clear.

Turning to interest rates, raising them is less clearly good or bad. On the one hand, as was discussed in the context of the risks for inflation, raising interest rates once the economy starts recovering is crucial to ensure that inflation remains low and under control. On the other hand, as was discussed in the context of the risks for employment, keeping nominal interest rates low for a prolonged period of time may be the more effective way to raise inflation expectations, lower the real interest rate, and stimulate the economy. Pursuing this more expansionary policy requires the Federal Reserve's willingness to accept the risk of higher inflation in exchange for the prospect of less unemployment, a familiar dilemma for monetary policy.

The Federal Reserve so far has kept nominal interest rates at zero. The experience of the late 1970s in the United States provides some support to the view that once inflation gets even a few percentage points above average, it will then be hard to bring inflation expectations down.

At the same time, an unwillingness to accept higher inflation was one of the policy mistakes that contributed to prolonging the Great Depression and the Japanese slump of the 1990s. Of particular relevance is the US experience in 1937–38. At the start of 1937, the US economy had been recovering from the 1929–33 tumble at a fast pace, leading to optimism that the depression might soon end. Both the administration and the Fed reversed their anticrisis stance and started publicly worrying about the increasing risk

of inflation, and newspapers and commentators pointed to the large increase in the monetary base, just as some are doing now. The Fed raised the amount of legally required reserves that banks had to hold in an attempt to contract the money supply, raising nominal interest rates and curbing inflation. In the two years that followed, the United States had one of the sharpest contractions in industrial production in its history. Only when those policies were reversed did the economy start expanding again. By then, however, the damage was done, and it took almost three years to fully recover.

This lesson from history should give serious pause to the Fed if it starts focusing too much on avoiding future inflation when there is little evidence for it. While it is in the nature of central bankers to be conservative and to worry about inflation, during a deep crisis such as the one existing today, all things considered, erring on the side of a loose monetary policy for too long may be the least bad of mistakes.

Finally, the last change as a result of the crisis was the payment of interest on reserves and the more than doubling of the monetary base. This is a change that is dear to academics since for more than forty years, starting with the work of Milton Friedman, there has been a defense of the current situation as an almost ideal state of affairs. The argument is that money is a good which is created at close to no cost by society: all it takes is a few more digits in electronic records to create additional reserves and an insignificant cost in paper and ink to print currency. Yet, the liquidity it provides is socially useful. It is therefore optimal, from the perspective of society, to flood the economy with liquidity until everyone's demand for it is fully satiated. If this takes many billions of dollars, then so be it.

A related way to make this point is to note that the opportunity cost of money for banks is that they earn only the interest rate on reserves on their holdings of money but could be earning the federal funds rate if they lent it to other banks. If the two interest rates are the same, this opportunity cost disappears. Banks and, going down the chain, households are then effectively satiated in their desire for money, since holding it becomes costless. When the Fed could not pay interest on reserves, this outcome could only be reached when interest rates were zero. This has often been referred to as the "Friedman rule."

Now that interest can be paid on reserves, it is possible to accomplish the Friedman rule by setting that interest rate equal to (or slightly below) the interest rate targeted in the federal funds market. The size of the money supply will then be whatever people happen to demand, now that liquidity is free. It may fluctuate, and even change abruptly over time, but as long as the two interest rates that the Federal Reserve now controls are set the same, this will be inconsequential for inflation. What is important is that there is enough money (or liquidity) in the economy for it not to constrain people's actions unnecessarily.

Conclusion

Changes, especially those that come unexpectedly, bring about worry. After 2008, a deep financial and real crisis in the United States has forced the Fed to make many changes in the conduct of monetary policy. For an institution that prides itself on its conservatism, and where any significant reforms usually follow year-long (or even decade-long) debates, these changes were both unexpected and uncomfortable. Even if they were

necessary, it is no surprise that there is already discussion of exit strategies, or ways to reverse all of the changes.

Whether it is possible to go back to the old regime and whether this is desirable are questions whose answers are still tentative. Still, in spite of a few dangers, there are also a few ways out, and with the right combination of skill and luck, US monetary policy may emerge better than it was before.

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I use the series UNRATE for unemployment, PCEPI for inflation, M1 for money, BOGUMBNS for the monetary base, GDPA for Gross Domestic Product, and DFEDTAR for the federal funds target rate.