Is the Federal Reserve playing with fire by buying more long-term securities? Could higher interest rates cause it to lose money?

To put downward pressure on long-term interest rates in the United States and stimulate the economy, the Federal Reserve (Fed) is continuing to expand its balance sheet and lengthen the average maturity of the securities it holds. This unconventional monetary policy would seem to put the U.S. monetary authorities in an increasingly delicate position, since long-term asset purchases are financed using very short-term liabilities. As long as short-term interest rates remain close to zero, these operations pose no problem; however, things could get dicey a few years from now, when rates head back up.

This Economic Viewpoint shows that the Fed could suffer financial losses if short-term rates were to rise too far. This could have consequences, such as depriving the U.S. government of seigniorage revenue (approximately US$80B in 2011). Concerns about inflation and the U.S. dollar could also intensify if investors were to lose confidence in the Fed’s ability to tighten its monetary policy. Having said that, our analysis suggests that the Fed still has a comfortable amount of wiggle room to stretch its balance sheet; moreover, there are tools available to it for dealing with any losses that might occur.

DEVELOPMENTS IN THE FED’S BALANCE SHEET

The asset purchases carried out by the Fed since 2008 under its unconventional monetary policy have generated rapid growth in its balance sheet. Initially, the securities purchased generally had short terms, but the Fed soon turned to accumulating securities with longer terms, such as mortgage-backed securities (MBS) and U.S. government bonds (graph 1). These assets were mainly acquired in three major batches associated with three separate quantitative easing (QE) programs. The first QE took place between October 2008 and March 2010, and expanded the Fed’s holdings of MBS, Treasuries and agency securities by US$1,750B.¹ The second QE program took place between November 2010 and June 2011 and brought in US$600B worth of Treasuries. The latest salvo announced by the Fed on September 13 consists of MBS purchases to the tune of US$40B per month, for an indefinite period of time. Moreover, starting in January 2013, the Fed could add Treasuries to its shopping list.

¹ The main announcement about QE1 was made in March 2009, with plans to purchase US$750B worth of MBS, US$300B of Treasuries and US$100B of agency securities. Before that announcement, it was not yet quite clear that the Fed was embarking on quantitative easing, even though it had already started purchasing MBS.
In addition to the three QE programs, the Fed has announced additional purchases of MBS and Treasuries to stabilize the size of its balance sheet in between the major expansion phases. This was necessary due to redemption of some of the securities it held, and prepayments of principal on MBS that were brought forward. In September 2011, the Fed also announced a program to extend the average term of its Treasuries portfolio (graph 2). This program, known as Operation Twist, was extended in June 2012 until the end of this year. It does not expand the size of the balance sheet, as each purchase of long-term securities is offset by the sale or the upcoming maturity of a shorter-term asset. The average term of the Treasuries held by the Fed is currently in the neighbourhood of 10 years.\(^2\)

INTEREST RATE RISK

To finance its asset purchases, the Fed creates new money (i.e. bank money), which lies among its liabilities under the “reserve balance with Federal Reserve Banks” item (graph 3). These short-term deposits are actually the excess reserves of the banking system stemming from the abundance of liquidity generated by the monetary policy.\(^3\) The 0.25% rate offered on these deposits is attractive, since at present the interbank overnight rate is fluctuating between 0.00% and 0.25%. Without this incentive, the excess reserves could be sidetracked to the real economy, and generate high pressure on inflation.

For the time being, the payments on deposits are not costing the Fed too much, compared to the return it is earning on its assets. The spread between the interest collected and the interest paid out is enabling it to rack up major surpluses, which are transferred to the U.S. government (graph 4). But the Fed is running an interest rate risk, because the amount of interest it collects on its long-term assets will technically be frozen for a long period of time, while the amount of interest it pays on its short-term deposits is likely to increase when it becomes necessary to tighten the monetary policy.


\(^3\) The Fed buys securities (MBS, bonds) in the secondary market with new money. This new money becomes a liquidity reserve that financial institutions can use to either expand their operations (do more lending), or deposit with the Fed. Currently, financial institutions prefer the second option.
Eventually, the Fed’s net interest revenues could even fall into negative territory if the short-term rates were to rise sufficiently.

**ISSUES THAT WOULD ARISE FROM A CENTRAL BANK IN DEFICIT POSITION**

The possibility of the Fed losing money raises several issues. For example, in circumstances where the U.S. fiscal situation is attracting a lot of attention, a potential decline in the Fed’s profitability would obviously not help allay people’s fears. Having said that, the portion of government revenues that comes from the Fed has never been very significant, and this should not add any real pressure on public finances. In any event, if the U.S. government were to start worrying about the revenues it derives from its central bank, investors would need to focus their attention on more crucial issues, such as inflation and depreciation of the U.S. dollar.

Concerns about inflation and the U.S. dollar could indeed intensify if investors started to doubt the Fed’s ability to tighten its monetary policy. Keeping interest rates too low for too long is known to overstimulate the economy, which could in turn raise inflation. People might also worry that the excess reserves of financial institutions could find their way into the real economy, a situation that would accelerate the creation of money and inflation. The U.S. dollar would be adversely affected not only by the loss of its purchasing power, but by flagging foreign demand for U.S. securities due to less attractive returns compared to the rest of the world. It would be surprising for the greenback to enjoy safe-haven status in such a situation.

**WHAT IS THE HURDLE RATE?**

To estimate the interest rate that would threaten the Fed’s profitability, we need to know the average rate of return on its assets. The Fed’s annual reports reveal the interest revenues that are earned on Treasuries, MBS and agency securities. If we divide those annual revenues by the average value of assets held during the year, we obtain the effective interest rate for each of these asset classes. Then we can easily calculate a weighted average rate (graph 5). In 2011, that rate was 3.3%. Therefore, to ensure the Fed’s profitability, expenses must not exceed 3.3% of the Fed’s assets.

But this is not a good estimate of the hurdle rate. We also need to take into account the fact that a portion of the assets held by the Fed is still offset on its balance sheet by the bank notes and coins that are in circulation. There is no need to pay interest on this particular liability, giving the Fed a good deal of leeway. At present, the amount of bank notes and coins in circulation recorded in the Fed’s liabilities is in the neighbourhood of US$1,150B, enabling it to finance approximately 40% of its assets at 0% interest. If we take this factor into account, the hurdle rate is estimated at 5.50% (box on page 4).

This is a very comfortable hurdle threshold for the Fed. According to our base economic scenario, the first key interest rate hike will probably not occur until the first half of 2015, and right now we are predicting an overnight rate of 2.50% by the end of 2016. To remain attractive, the interest rate on deposits might require a 25 basis point premium, which would put it at a maximum of 2.75% (graph 6). At that level, we would still be far from the hurdle threshold, and it could take several more years to reach it.

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4 Interest revenues from Treasuries, MBS and agency securities are not the Fed’s only sources of revenue; however, they account for a very large share of it: approximately 95% of total revenues in 2011. Given the small amount of influence that other sources of revenue have on the Fed’s profitability, we have not considered them in this analysis.
The latest developments push the hurdle rate down

But to rely on the 2011 numbers would lead us to overestimate the hurdle rate. The most recent developments in U.S. monetary policy, such as Operation Twist, QE3 and the reinvestment in MBS, combined with recent interest rate trends, have a downward effect on that rate.

Operation Twist
At its conclusion, Operation Twist will have required the purchase of US$667B worth of long-term securities (with an average term of slightly over 10 years).\(^5\) Now, the average return of the assets purchased under this program is probably lower than that of the shorter-term securities that have to be sold. We can see this by comparing the past yield of a 5-year bond with the yield of a 10-year bond in 2012: the 10-year yield is lower (graph 7). In the end, Operation Twist can therefore cause the Fed to lose a few basis points of interest revenue, and lower the hurdle threshold for profitability slightly. For a more precise calculation, we would have to consider many other factors. Certain transactions, such as the purchase of a 30-year asset in exchange for the sale of an asset with a term of 3 years or less, could even help increase the average return on assets.

Reinvestment in MBS
Since September 2011, the Fed has stabilized the size of its MBS portfolio. Due to the downward trend of mortgage rates in the United States, many Americans have renewed their mortgages, leading to the prepayment of the principal of the subsequently issued MBS. The amounts at stake here are far from small. On average, the Fed has planned reinvestments

\(^5\) The Fed has pledged to concentrate 32% of its purchases on terms of 6 to 8 years, 32% on terms of 8 to 10 years, 4% on terms of 10 to 20 years and 28% on terms of 20 to 30 years. The remaining 3% is concentrated on inflation-indexed bonds with terms of 6 to 30 years.
of approximately US$28B per month since the introduction of this policy (graph 8). For the year 2012 alone, approximately US$340B in new MBS will have been acquired.

But the main issue is that the yield demanded of these assets has diminished considerably in recent years: the average yield for agency MBS at the time of the first QE was around 4.00%, compared with 2.40% in 2012 (graph 9). Based on the data contained in the Fed’s annual report, we estimate an effective interest rate of 4.2% for the MBS portfolio in 2011. That estimate should drop significantly in 2012 and 2013 as the reinvestment policy continues.

With Operation Twist coming to an end, the Fed could decide to expand its QE3 by continuing to purchase around US$45B worth of long-term U.S. Treasury bonds per month, but without having to relinquish shorter-term bonds. At that pace, the portfolio of Treasury assets would be increased by US$400B by next fall. In that case, QE3 would have a greater downward effect on the hurdle rate. Bond yields currently stand near their historic lows, and any acquisition of new Treasuries will reduce the average yield of the Fed’s portfolio (graph 11 on page 6). By the time the purchases draw to a close, the average yield could fall to 2.60%. This is based on the assumption that approximately one fifth of the Treasuries would yield close to 2.0% and that the rest would keep providing interest income of 2.8% as was the case in 2011.

QE3
The new quantitative easing program will intensify the decline of the effective interest rate of the MBS portfolio by adding more low-yield securities. Assuming that purchases continue at the rate of US$40B per month until the fall of 2013, nearly US$500B worth of low-yield MBS will be added on Fed’s balance sheet. These new assets will account for more than a third of the MBS portfolio, amounting to around US$1,350B by then. Under current market conditions, we can estimate that the yield of the MBS purchased under the QE3 program will hover around 2.25% on average. If we take into account a slightly higher average yield, i.e. 2.50%, for securities purchased since September 2011 under the reinvestment policy, and a yield of 4.20% for the remaining securities, we arrive at a weighted yield of 2.80% by the end of 2013 (graph 10).

The estimated average yield for securities acquired under the reinvestment policy is higher, as the yields at the outset of that policy were higher. We also assume that the reinvestment policy will continue until the end of 2013, but at a pace reduced by half compared with 2012, since the pace of MBS prepayments should slow down when mortgage rates stop falling.

6 There are many types of MBS. The Fed purchases those issued by government-sponsored agencies, including Ginnie Mae, Fannie Mae and Freddie Mac.

7 This is consistent with a slightly higher average yield than what we foresee for the 10-year bond yield in the same period, since the average term of securities acquired could be a little longer than 10 years.
According to our estimates, the combined effects of the reinvestment policy and QE3 will reduce the average yield for assets to 2.70% by the end of 2013 (graph 12). To arrive at the final estimate of the hurdle rate, we must also take into account that, due to the expected expansion of the Fed’s balance sheet, a larger portion of assets will have to be financed by short-term deposits. Still assuming that QE3 will draw to a close in the fall of 2013, the volume of Fed assets should culminate at close to US$3,700B. By then, the amount of money in circulation should keep rising slowly to reach around US$1,200B. Therefore, the portion of assets to be financed by deposits will become 67.5%, and the hurdle rate will be 4.0%.

Although this is a considerable drop compared with the first estimate, this hurdle rate is still fairly comfortable for the Fed. It will probably take until 2017 or even 2018 to reach that level. Moreover, between now and then, the portion of assets financed by bank notes and coins in circulation will gradually increase, thus raising the hurdle rate slightly. On the other hand, it is important to note that any extension of QE3 and of the reinvestment policy beyond our assumptions would help to lower the hurdle rate further. We estimate that an extension to the end of 2014 would reduce that rate to 3.40% (graph 13).

Having analyzed the Fed’s balance sheet, and based on what we foresee for the U.S. monetary policy, the probability of the Fed incurring losses in the medium term strikes us as being quite low. The Fed’s interventions, if they are not extended beyond the fall of 2013, will remain in keeping with the amount of leeway available.

It is also important to keep in mind that the Fed has tools at its disposal with which to successfully carry out monetary tightening when the time comes. First of all, the interest rate on deposits at financial institutions can be raised several times without jeopardizing the Fed’s profitability. After that, if more action were needed, the Fed could anticipate its future financing requirements and issue longer-term deposits in order to freeze a portion of its interest costs. Sales of assets could also be considered to reduce the financing requirements, but if the yields rose too far, that would mean the market value of the assets would be declined and losses would still be incurred.

9 The Fed’s current assets amount to US$2,900B. Between now and next fall, another US$400B in Treasuries and US$400B in MBS should be added, for an estimated total of US$3,700B.

10 Between 2000 and 2011, the average annual rate of growth of money in circulation was 5.60%.

11 We are maintaining the same assumptions as in our base scenario, apart from the fact that the Fed is building up more low-return Treasuries and MBS. We do not assume that the yields of U.S. bonds and MBS would fall further in the markets in 2013 and 2014.
Waiting for the terms to expire could be a better way out, but only in the longer term. Due to Operation Twist, the Fed will have very few assets reaching maturity before January 2016, as nearly all the securities with terms of three years or less will have been sold. Nor will it be able to rely on prepayments of MBS, since the expected stabilization of mortgage rates, or even their rise, will reduce the number of mortgage loan renewals in the United States.

Lastly, if these tools do not make it possible to avoid financial losses, the Fed would have three other options. It could increase the ratio for financial institutions’ mandatory reserves. The interest rate paid on such reserves could be lower than the deposit rate on surplus reserves. This measure would transfer a cost to the banking system, however. The Fed could also opt to temporarily amass deficits. Eventually, surpluses would return and, before undertaking payments to the U.S. government, the Fed would pay off its past deficits. Moreover, the U.S. Treasury could simply opt to absorb the losses, which would, in fact, result in a very slight increase to the government’s consolidated debt. These are highly hypothetical scenarios, however, and the Fed will likely not have to go there given how much leeway it has.

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