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## **12. Potential Effects of Very Low Policy Rates on Federal Funds & Other Money Markets<sup>1</sup>**

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### **Executive Summary**

The possibility that further cuts in the target federal funds rate might be necessary to foster satisfactory economic performance has raised questions about how money markets would operate in an environment of very low short-term interest rates and in the aftermath of such a period. This note considers the possible effects of very low short-term interest rates on several aspects of money market functioning. Given the low levels of opportunity costs, activity in various money markets seems likely to decline further, and liquidity could well diminish. Investors may choose to hold larger balances in transaction accounts than previously. Depository institutions' daylight overdrafts may continue to decline. The infrastructure supporting money market activity—for example, the number of active money market brokers and the experience level of federal funds traders and reserve managers—could be eroded temporarily during a period of very low interest rates and may take some time to recover after rates are no longer low.

### **The Federal Funds Market**

As a result of the very high level of reserve balances, the effective fed funds rate has been significantly below target in recent weeks. The federal funds rate was around 22 basis points at the end of October, climbed to around 55 basis points in late November, and began to decline again in December with the anticipation of additional monetary policy easing. In principle, the payment of interest on excess balances should provide a floor to the federal funds rate, but in practice, several large lenders in the market are not eligible to receive this interest, and the arbitrage from the market rate to the excess rate has been incomplete.

The extraordinarily high level of balances and the payment of interest on excess balances have together led to a decline in the daily volume of overnight brokered federal funds transactions. Brokered volume, which averaged \$100 billion in the twelve months before the credit crunch began in August 2007, grew to an average of \$120 billion in the nine months after. In September 2008, however, the amount of reserve balances provided through the various Federal Reserve liquidity facilities exceeded the Desk's ability to drain balances, and the level of balances outstanding soared. In early October, the Federal Reserve began to pay interest on required and excess reserve balances. As a

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<sup>1</sup> This note borrows heavily from the 06-18-2003 memo, "Some Potential Financial Sector Implications of Very Low Short-Term Interest Rates" by James Clouse (Board), Spence Hilton (FRBNY), and Ken Kuttner (FRBNY).

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result of these two developments, average daily brokered volume decreased back to \$100 billion in mid-October and slid a bit more through early December. The composition of daily trading has also changed. A larger proportion of brokered transactions now reflects selling by institutions that cannot earn interest on balances, in particular the GSEs, for two reasons. First, the GSEs cannot earn interest by leaving funds in their account at the Federal Reserve and thus have an incentive to sell funds for any positive return. Second, some GSEs have become reluctant to engage in term lending of federal funds and appear to have shifted these funds into the overnight market. As a result, the fraction of lending in the overnight federal funds market that comes from GSEs has increased from 35 percent in July 2008 to 56 percent in November.

A further reduction in the target federal funds rate would likely reinforce the previously discussed trends. Volume in the market could continue to decline, however, it is unclear at what market rate there would be an especially sharp decline. As noted, above, trading volume has declined from its peak, but has not collapsed. In the case of Japan, discussed in section 4, the money market only disappeared when the policy and market rates were essentially at zero. In the Japanese experience, the market recovered after overnight rates rose, but the recovery took time and was incomplete.

Some market participants have speculated about the possibility of negative rates in the federal funds market. While federal funds can and have traded at zero in small volumes, it is unlikely that any significant volume of federal funds would trade below zero. Selling federal funds creates an asset on the DI's balance sheet equal to the reduction in their Federal Reserve balances due to the sale, so the transaction does not reduce the overall balance sheet size. As such, it is not clear why even a GSE would take a counterparty credit risk and simultaneously "lose" money on a negative-rate transaction.

### **Eurodollars<sup>3</sup>**

Many institutions that cannot sell in the federal funds market are able to lend indirectly to U.S. DIs via Eurodollar sales. In fact many domestic DIs borrow heavily from a wide variety of investor types, including corporate accounts and money funds, booking Eurodollar deposits at branches located outside the United States. Non-DI (and non-GSE) lenders in the Eurodollar market generally settle these trades through transactions accounts maintained at a clearing bank. In general, we might expect rate and trading behaviors in the Eurodollar market to be similar to those of the GSEs in the federal funds market, as the incentives would be equivalent.

### **FDIC Guarantee and short-term markets**

On October 14, 2008, the FDIC announced the Temporary Liquidity Guarantee Program (TLGP), and released final rules on November 21, 2008. One aspect of this rule was to guarantee an unlimited quantity of non-interest bearing transaction deposits. With

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<sup>3</sup> Eurodollars are dollar-denominated unsecured deposits made in foreign banks or foreign branches of U.S. banks.

money market rates very close to zero, and with credit risk a prominent concern, this guarantee is apparently seen as attractive. Demand deposits grew at a seasonally adjusted annual rate of over 130 percent in November. Reportedly, some of this growth reflects large money center banks converting large time deposits into demand deposits. If money market rates were all near zero, investors in any other type of money market instrument could easily perceive the guarantee from the FDIC as being more valuable than a modest positive return on a risk-adjusted basis. The implications for the banking system as a whole are likely not adverse, because there would either be net inflows to deposits or a substitution of one type of deposit for another. For other short-term instruments, such as agency discount notes, demand could well be curtailed as investors shift toward bank deposits. Another aspect of the guarantee was that in the final rules, liabilities with maturities under one month were excluded from the guarantee. This exclusion was well received by the market because there were concerns that the 75 basis point guarantee fee would severely impair overnight markets.

### **General Collateral RP Market**

Many investors find general collateral (GC) repurchase agreements (RPs) attractive because they provide an investment that is essentially free of credit risk.<sup>4</sup> If the federal funds rate were cut to a level close to zero, rates on short-term RPs against general Treasury collateral would likely be pushed to zero, apart from associated transactions costs, while rates in other short-term markets, including GC RPs against agency debt and other collateral, would continue to reflect some credit risk. For a more complete discussion, see section 11, “Functioning of Treasury Securities Markets”.

### **The Specials RP Market**

Recently, very low short-term interest rates have created significant disruptions in the special collateral RP market even if the target federal funds rate is still some distance above zero. Ordinarily, securities that are “on special” in the repo market are the most liquid and sought-after securities. In order to obtain these specific securities, market participants are willing to lend cash to counterparties at a so-called “specials rate” that is below the GC rate. For a discussion of the impact, see section 11, “Functioning of Treasury Securities Markets”

### **The FX Swaps Market<sup>5</sup>**

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<sup>4</sup> A general collateral RP is a repurchase agreement in which the lender of funds is willing to accept any type of Treasury security as collateral. This is to be distinguished from a special collateral RP, discussed in the following section, in which the lender of funds seeks to borrow a particular security.

<sup>5</sup> FX swaps are over-the-counter (OTC) instruments involving both a spot and a simultaneously offsetting forward transaction between two currencies. The use of FX swaps is similar to the actual borrowing and lending of currencies on a collateralized basis, and provides an alternative to directly borrowing and lending in the Eurodollar or other offshore markets. FX swaps are extremely popular among OTC interbank dealers, and now account for nearly half of total turnover in the U.S. OTC foreign exchange market. They are widely used by traders and other market participants for managing liquidity and shifting delivery dates, for hedging interest rate or exchange rate risk, taking positions on interest rates, or exploiting comparative advantages in raising funds in one currency versus another.

Very low short-term interest rates are unlikely to create significant distortions in the FX swap market. If each counterparty can borrow in its each currency, then the forward price of a swap agreement should reflect the spot foreign exchange rate adjusted by the interest rate differential in the two currencies. Ordinarily forward prices correspond quite closely to the differential between Libor rates in the two currencies, but since August 2007 for swaps involving dollars, the forward prices have been much higher than differences between Libor rates, with effective dollar costs being much higher, as some foreign financial firms bid at relatively high rates to swap for dollar funding. There is currently little activity in any FX swaps markets involving the dollar as financial institutions have become reluctant to lend dollars.

If the dollar Libor rate fell to close to zero, it would be unlikely by itself to impede the functioning of the FX swap markets. Because the pricing of a swap depends on the interest rate differential, the levels of the interest rate in either of the two currencies do not directly factor in to the FX swap market. Thus, very low dollar interest rates should have little bearing on activity on the market. If both dollar short-term rates and another currency's short-term rate were very close to zero, however, some difficulties may arise. In such a situation, one could imagine greater volatility in short-term rate differentials. This volatility could show through to the pricing of forward foreign exchange rates and the forward pricing in swaps contracts. In principle, such a condition could impair trading.

### **Daylight Overdrafts**

Amid very low overnight rates and extremely high levels of overnight balances, demand for intraday credit has decreased since mid-September. For several days in the wake of the failure of Lehman Brothers, average daylight overdrafts increased significantly, and peak overdrafts reached record levels exceeding \$300 billion. Immediately following the failure, the level of overnight balances began to rise significantly, and the effective federal funds rate declined. During this period, average daylight overdrafts began to diminish slightly, and peak daylight overdrafts declined notably. In late October and into November, the level of overnight balances surged to well over \$600 billion, and daylight overdrafts dropped precipitously to levels below those seen before the beginning of the market stress in August 2007. Concurrently, the effective federal funds rate dropped to levels below the daylight overdraft fee of 36 basis points at an annual rate. Even before the effective rate was below the daylight overdraft fee, the market rate faced by some large banks was likely below the overdraft fee. As a result, the contemporaneous timing of the sharp rise in overnight balances with the fall in the funds rate makes it difficult to assess the independent effect of market rates on the demand for daylight overdrafts. That said, the fact that overdrafts fell somewhat even before the decline in the funds rate suggests that it is the level of overnight balances more than the overnight rate that is responsible for the drop in overdrafts. As a result, further declines in the overnight rate may not be likely to reduce the level of daylight overdrafts, but increases in the level of reserve balances likely will.

### **Important Intermediaries**

A sharp fall in activity in the federal funds market could have an institutional effect in terms of federal funds brokers and reserve managers at banks, though the effect may be only temporary. The number of major brokers has already been halved in the past five years, as economies of scale have created pressure to merge. A collapse of the market could put more pressure on these firms. Similarly, in 2003, when the federal funds rate was at 1 percent, trading desks apparently lost staff. Judging from the experience in Japan, the resumption of money market activity may be delayed for a time by a lack of intermediaries, but it seems plausible that, given time, these roles would be replaced.

The implications of a move towards a zero level of short-term interest rates for two classes of institutions that play a key role in money markets—money market mutual funds and depositories—are discussed in separate notes.

### **Low short-term interest rates, interest on reserves, and the demand for balances**

The combination of very low overnight interest rates, the extraordinarily large supply of balances provided through the various liquidity facilities, and other measures in place seem likely to produce some changes to the composition of balances held by depository institutions. The level of excess balances has increased in the first instance as a result of the extraordinary liquidity operations. Required reserve balances and contractual clearing balances tend to adjust somewhat slowly. It is not clear, however, that this change in composition is likely to have any meaningful effect on market function or market participants.

The very low level of overnight interest rates combined with the FDIC's unlimited guarantee on non-interest bearing transaction deposits has led to an increase in these deposits, and therefore on required reserves and required reserve balances. With depository institutions receiving interest on required reserve balances, there is little or no cost to these institutions to permitting their customers to expand their reservable deposits. As a result of all of these factors, required reserves and required reserve balances have increased by \$7½ billion since the end of September, resulting in a doubling of required reserve balances. Further reductions in the target or effective federal funds rate seem likely to reinforce this trend to some degree.

In contrast, contractual clearing balances have declined almost \$2 billion since the end of September and can be expected to decline further. The interest rate paid on excess balances (now the target federal funds rate) exceeds the rate paid on contractual balances, which is tied to the three-month moving average of the yield on the three-month Treasury bill. This interest differential is likely to continue, so excess balances would appear to dominate contractual clearing balances, and contractual clearing balances should continue to decline. If the target rate or the rate on excess were to decline to zero, the discrepancy in rates could disappear. That said, the level of rates for either excess or contractual clearing balances would be sufficiently low that the greater flexibility of excess balances

would likely still be preferred, and there appears to be little reason to believe that contractual clearing balances would rise.