

September 6, 2012

## **Reducing the Interest Rate Paid on Excess Reserves<sup>1</sup>**

### **Introduction**

This memo revisits the potential benefits of reducing the rate of interest on excess reserves (IOER) and considers some of the possible consequences for the structure and functioning of money markets.<sup>2</sup> Only a reduction in the IOER rate to 15 basis points from its current level of 25 basis points is considered.<sup>3</sup> Also, the target range for the federal funds rate is assumed to be maintained at 0 to 25 basis points, at least for some period of time.<sup>4</sup> In exploring the possible effects of a 10 basis point cut in the IOER rate, we take into account the experience in European markets since the European Central Bank (ECB) reduced the rate on its deposit facility from 25 basis points to 0 basis points in July, and of trends in U.S. money markets over the past year or so.

Most of a 10 basis point reduction in the IOER rate would likely show through to overnight and other short-term money market rates, a somewhat greater pass-through than might have been expected prior to the modest rise in most money market rates seen over the past year or so. However, the economic impact would be relatively slight, even if a 10 basis point IOER rate cut were fully passed through to overnight market rates and reflected in longer-term rates. A rule of thumb based on the FRB/US model indicates such a decline in rates might increase the level of real GDP by just 0.1 percentage points over two years. Still, this benefit, as well as considerations of a possible direct stimulus to bank lending not captured in conventional interest rate channels and a reduction in any public perception that the Federal Reserve is effectively subsidizing banks when the IOER rate is above banks' marginal borrowing costs, might outweigh the possible market functioning risks associated with a 10 basis point IOER rate cut.

At current levels of market rates, a 10 basis point IOER rate cut would not be expected to be large enough to lead to sustained negative rates on money market instruments. Downward pressure on interest rates could intensify, however, if factors behind recent increases in market rates, such as the changes in collateral supply and demand conditions discussed below, were to

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<sup>1</sup> The primary authors of this memo were Marnie Gillis DeBoer (Board), Michiel DePooter (Board), and Spence Hilton (FRBNY) with extensive contributions and comments from many colleagues.

<sup>2</sup> The two most recent memos provided to the FOMC that considered the impact of an IOER rate cut are: "Reconsidering Lowering the IOER Rate" on October 25, 2011 by Chris Burke et al., and "Implications of Reducing the Interest Rate Paid on Reserves" on September 17, 2011 by Chris Burke et al.

<sup>3</sup> We assume that the interest rate paid on required reserve balances and the IOER rate, both currently 25 basis points, would be reduced by the same amount. For consistency with prior memos, the term IOER rate will be used here to refer to both rates.

<sup>4</sup> The FOMC may wish to assess the impact of a cut in the IOER rate on short-term market rates in general before determining whether it would be appropriate to adjust the target range for the federal funds rate or to make any other adjustments to its policy objectives for short-term rates. The Board could consider cutting the primary credit rate by 10 basis points at the same time as it cut the IOER rate, or alternatively it might prefer to adjust the primary credit rate only after the appropriate action regarding the target range for the federal funds rate has been determined.

unwind, or as a result of any significant expansion in reserves stemming from further Federal Reserve asset purchases. Furthermore, recent developments in Europe, where rates turned negative following official rate cuts, show that the potential for sustained trading at negative rate levels in U.S. funding markets cannot be ruled out. Even so, there currently do not appear to be significant operational or technical impediments to negative rates in U.S. financing markets.

In general, lowering the IOER rate closer to zero could have important implications for the structure and functioning of financial markets, including placing more pressure on money market funds and their sponsors and prompting some to exit the business. But significant shifts in patterns of financial intermediation do not seem likely with a reduction in the IOER rate to 15 basis points and would likely be manageable even if they prove to be somewhat greater than anticipated. A cut in the IOER rate could place more pressure on depository institutions to charge explicit interest or raise fees on deposits, and negative rates on retail deposits in particular carry some reputational risk for the Federal Reserve. The federal funds market would be at increased risk of shrinking further, with the rate possibly becoming more idiosyncratic in its behavior.

### **Summary of New Information**

Developments in Europe in the wake of recent reductions in central bank policy rates, as well as trends in domestic money markets over the past year or so, should be considered in assessing the possible effects of a cut in the IOER rate. Key developments in these areas are described in this section.

#### *European experiences*

At its July 5 policy meeting, the ECB cut its key policy rates by 25 basis points in response to the ongoing euro-area debt crisis and mounting downside risks to euro-area economic growth. Along with the reduction in the Main Refinancing Rate (MRR) to 75 basis points, the action reduced the interest rate the ECB pays on deposits to 0 basis points.<sup>5</sup>

It is important to note here that money markets in the euro area are highly bifurcated as a result of the European debt crisis. Most banks in the periphery have lost access to funding in the interbank market and almost solely rely on funding from the ECB. As a result, for these banks the MRR is the policy rate that most directly influences their funding costs. European banks that still have access to funding in the interbank market can obtain funds at rates well below the MRR, in large part because massive injections of euro liquidity through ECB refinancing operations have driven the overnight interbank market rate down to a level close to but still above the rate banks can obtain depositing excess funds at the ECB. For these banks, the deposit rate, which serves as a floor for the overnight market rate, is the policy rate that is currently most relevant for their funding costs.

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<sup>5</sup> The Danish central bank, which pegs its currency to the euro, followed the ECB's rate cuts by lowering its main policy rate by 25 basis points, while also reducing its one-week certificate of deposit rate. This deposit rate was cut to below zero for the first time, to negative 20 basis points, in an effort to drive Danish interest rates lower to prevent upward pressure on the Danish krone.

Although the use of the deposit facility, which increased further in the wake of the ECB's two 3-year Longer-Term Refinancing Operations (LTROs), dropped significantly after the deposit rate cut, funds held in banks' current accounts with the ECB increased by an offsetting amount. This reallocation reflects the fact that the rate paid on deposits in the deposit facility fell to zero—identical to the rate paid on excess reserves in current accounts.<sup>6</sup> ECB rate changes have no immediate effect on the overall level of deposits at the ECB (that is, the sum of the deposit facility and current account). That level is a function of funds supplied through prior ECB operations, like the LTROs.

Since the ECB's action, the Euro Overnight Index Average (EONIA), a euro-area analog of the effective federal funds rate, has fallen roughly 20 basis points to just above 10 basis points. EONIA has continued to be consistently above the ECB's deposit rate, maintaining the positive spread between the two rates, shown in Chart 1.<sup>7</sup> EONIA trading volume is little changed on average since the rate cuts and has remained at the lower end of its historical range, as trading volumes continue to be driven primarily by the level of excess reserves in the euro area.

The ECB's rate cuts successfully lowered euro-area short-term interest rates. These lower rates have, however, raised questions about the viability of euro-denominated stable net asset value (NAV) money market funds (MMFs) and the smooth operation of securities repurchase markets and other short-term funding markets. While it is possible that some adverse effects in financial markets may develop, so far market functioning in the euro area does not seem to have deteriorated.<sup>8</sup>

General collateral (GC) repo rates for core euro-area sovereign collateral have turned negative following the ECB cuts. Concerns about a possible increase in fails do not seem to have been borne out as yet. Yields on core euro-area Treasury bills have also fallen into, or more deeply into, negative territory. German bill rates, which as a result of their safe haven status amid heightened risk in the euro area had first turned negative in late-November, and again in late-May, have fallen further (see Chart 1). German rates further out on the curve also turned negative. Interestingly, spreads of other core euro-area sovereign yields over comparable-maturity German yields narrowed sharply after the ECB lowered rates, most likely reflecting a reach for yield by investors facing negative returns. Repo rates and yields on bills and bonds of peripheral euro area sovereign debt have generally remained positive.

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<sup>6</sup> Excess reserves held in banks' current accounts at the ECB are not remunerated. Before the cut to the deposit rate, banks would therefore ordinarily sweep excess balances from the current accounts to the deposit facility. With the deposit rate at zero, banks have no incentive to do so anymore.

<sup>7</sup> In contrast, in the U.S., the effective federal funds rate and other overnight market rates have generally printed below the IOER rate, reflecting different dynamics in U.S. overnight markets compared to those in the euro area. For example, in U.S. money markets, many of the institutional investors are not eligible to earn the IOER rate directly, including the GSEs. Also, excess reserve levels in the euro area have been smaller than in the U.S., even since the ECB started offering unlimited funds in its refinancing operations.

<sup>8</sup> As discussed in more detail below, the majority of euro-area MMFs have variable NAVs. In addition, some MMFs also have less restrictive investment policies. The European experience with MMFs as a result of the cut in the ECB's deposit rate may therefore provide only limited insight into the likely effects on U.S. MMFs of a reduction in the IOER rate.

### *Developments in U.S. Money Markets*

Over the first half of 2012, most overnight and other short-term rates in U.S. money markets trended higher, rising above the very low levels reached after the FDIC changed its deposit insurance assessment fee schedule in April 2011, and they have since maintained most of those increases, as shown in Chart 2. Some of the largest increases have been in overnight GC repo rates for government securities (including agency and MBS debt as well as for Treasury securities). Changes in supply and demand conditions for this collateral are the most commonly cited factors behind the upward pressure on short-term rates generally, either directly or indirectly.<sup>9</sup> These conditions include increased collateral supply held by dealers as a result of sales of short-term Treasury securities under the Federal Reserve's maturity extension program as well as continued sizable net Treasury debt issuance. Moreover, FOMC conditional guidance on short-term rates has reportedly increased dealer appetite for holding expanded inventories of government securities that are mostly financed in repo markets, by reducing the perceived interest rate risk of these positions.

Foreign banking organizations (FBOs) collectively remain the largest borrowers in overnight unsecured bank funding markets (federal funds and Eurodollars), just as they were over most of 2011, although in 2012 some larger domestic regional banks established a greater borrowing presence. In the federal funds market, total trading volume has continued to erode, and the investment base has been heavily dominated by the Federal Home Loan Banks (FHLBs); Fannie Mae and Freddie Mac sharply curtailed their activity in the federal funds market in 2011 to reduce unsecured exposures, either re-directing lending into GC repo markets or holding higher balances at the Federal Reserve.<sup>10</sup> The distribution of holdings of reserve balances at the Federal Reserve across entity types has been relatively steady for the past year or so, with FBOs continuing to hold close to half of all balances.<sup>11</sup> Investors have continued to pull back from MMFs this year, but the rate of decline in assets under management (\$145 billion, or 5 percent at an annual rate, through July) remains manageable. Prime MMF exposure to Europe this year has moved within a range of 30 to 35 percent of total prime MMF assets, down from about 50 percent in mid-2011.

### **Potential Benefits**

#### *Impact on Money Market Rates*

Lowering the interest rate that banks earn on their excess reserve holdings would be expected to reduce banks' demand for short-term borrowing, thereby immediately lowering rates in bank and

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<sup>9</sup> For a more complete description of the rate trends described here see "Money Markets: Domestic Money Market Rates Remain Elevated since April FOMC" by John Falcone, posted to MarketSource on June 8, 2012.

<sup>10</sup> Daily federal funds trading volume arranged through New York brokers has averaged about \$30 billion since late 2011. This compares to about \$60 billion from early 2009 to early 2011, and over \$100 billion in the years just prior to 2009.

<sup>11</sup> Factors behind the proportional increase in both the level of reserves and amount of borrowing in bank funding markets accounted for by the FBOs include their desire to hold more balances as a liquidity buffer and the disproportionate impact that the change in FDIC assessment fees had on effective borrowing rates of domestic banks.

closely linked wholesale funding markets, such as federal funds, Eurodollars, and GC repo, and pulling other rates down with them.<sup>12</sup> To some degree, a cut in the IOER rate might also help lower market rates by reinforcing perceptions about policymakers' determination to reduce rates through their asset purchase programs and forward guidance for short-term rates, especially if the cut were presented as part of a package of policy actions.

At current rate levels in these markets, which range from 13 to 20 basis points, it is possible that most of a 10 basis point cut in the IOER rate would pass through to a decline in short-term funding rates. The extent of pass-through might be less in those markets where rates are closest to zero, although trading at modestly negative rates is quite possible. An exception is the federal funds rate, as almost all investors in this market have the option of holding balances at the Federal Reserve earning a non-negative return.<sup>13</sup> At current rate levels, a cut of 10 basis points in the IOER rate might not be expected to create much pressure on market rates to fall below zero in any event. However, this pressure could intensify if the factors behind recent increases in short-term rates cited above were to reverse, or as a result of any substantial increase in reserve levels such as would be associated with any significant expansion in Federal Reserve asset purchases.<sup>14</sup>

To date, trading at negative rates in U.S. markets has been sporadic, but the European experience since the cut in the ECB deposit rate to zero underscores the feasibility of persistent negative rates in wholesale funding markets when the level of excess reserves is high and the rate of remuneration is low. The infrastructure in domestic money markets seems largely capable of supporting widespread trading and investing at negative rates, including Treasury's ability to accept negative bid rates at its bill auctions (details for Treasury auctions and trading are provided in the appendix). It is also not obvious to what degree investors would increase their appetite for either longer-term or riskier assets just to avoid negative rates. The possibility that banks could encounter effective resistance in imposing negative rates on their deposit liabilities

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<sup>12</sup> Simultaneously lowering the target range for the federal funds rate, say, by bringing down the upper end of this range to 15 basis points, might further reinforce market perceptions about policymakers' determination to maintain low short-term rates, but it is unclear that it would have any additional impact on market rates operating through other channels. The reduction in the IOER rate alone would be expected to maintain the federal funds rate below the IOER rate, absent a deterioration in federal funds trading volume that would perversely increase the daily average rate (discussed below), as well as pressure other short-term rates closer to, if not below, 15 basis points.

<sup>13</sup> We discuss below the possibility that a cut in the IOER rate could reduce trading activity in the federal funds market in ways that weaken the link between the effective federal funds rate and other overnight funding rates.

<sup>14</sup> Earlier estimates made during the period of high excess reserves suggested that an increase of \$100 billion to \$200 billion in excess balances was associated with a 1 basis point reduction in the federal funds rate. Given the growth in reserves since these estimates were made, and the possibility of a nonlinear relationship as rates approach zero, the impact could be even less under current conditions. See the memo to the FOMC "Reserves and the Federal Funds Rate," by Gara Afonso et. al., January 19, 2010.

could limit the prevalence of negative rates in wholesale funding markets, by providing an alternative investment option offering a non-negative return, a possibility considered below.<sup>15</sup>

### *Impact on Bank Lending*

In terms of an individual bank allocating its funds across assets, the rate paid on reserve balances more directly represents the opportunity cost to banks of taking on all other types of assets, including bank loans. Thus, it is possible that a decrease in the IOER rate would increase banks' incentive to lend, but all else equal, a 10 basis point reduction in the IOER rate will likely have only a small stimulative effect on lending, especially because of headwinds that continue to buffet bank lending. While bank credit began to expand again in 2011 and continued to grow through the first part of 2012, overall, demand for bank loans remains muted and lending standards remain tight relative to historical standards. A 10 basis point cut in the IOER rate could also provide a small incentive for banks to purchase longer-term Treasury securities or MBS in an effort to obtain higher yields further out the curve, in effect amplifying slightly the effect of the Federal Reserve's large scale asset programs.

### *Elimination of appearance of bank subsidy*

The original purpose of seeking authority to pay interest on reserves was to eliminate the so-called "reserve tax" on holding balances at a Federal Reserve Bank to meet reserve requirements. Since the Board received the authority to pay interest on reserves in 2008, the remuneration rate on all reserve balances has been cut to 25 basis points while many short-term market rates have fallen below this level. The fact that depository institutions are remunerated at a rate generally above market rates by the amount of the spread between the IOER rate and other overnight unsecured wholesale funding rates may be perceived by the public as representing a subsidy the Federal Reserve is extending to depository institutions.

Concerns about providing an IOER rate above other short-term market rates may be more acute in the case of FBOs, as they hold a sizable quantity of total reserves and are not subject to the FDIC assessment fee. Reducing the IOER rate may have the effect of ameliorating this political concern, although any benefit would be diminished to the extent that banks' funding rates fall in tandem with a decline in the IOER rate.

## **Potential Costs**

### *Impact on Money Market Funds and Shift in Intermediation of Short-term Credit*

We expect further decreases in U.S. money market rates to exacerbate pressures already present for MMFs in the current low-rate environment. Indeed, many MMF sponsors have been waiving fees for several years to maintain a stable NAV of one dollar as they reportedly have been willing to tolerate lower revenues from—and even subsidize—their MMFs in order to continue to offer a complete suite of products to investors. Very low yields alone have not been an

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<sup>15</sup> In a related fashion, because the Federal Reserve does not assess a negative interest rate on the balances held by foreign central banks (FCBs) in facilities at the FRBNY, negative or even rates very close to zero in money markets could induce FCBs to increase the balances they leave at the FRBNY. Some possible responses of the Federal Reserve are discussed in the appendix.

impetus for disruptive investor redemptions, and MMF closures in recent years have been orderly.<sup>16</sup>

The July 5 ECB rate cuts led many stable-NAV euro-denominated MMFs to stop selling shares to new investors, and one small euro-denominated fund liquidated, citing the effects of the rate cut. While the closures to new investments parallel similar closures among government-focused MMFs in the United States (which invest in short-term Treasury, Agency, and GSE debt, as well as repo backed by these instruments) in late 2008 and early 2009, additional insight into the likely effects of a lower IOER rate, particularly on private credit intermediation in the United States, may be limited, as the stable-NAV euro-denominated MMF industry is small (roughly \$140 billion) relative to the U.S. industry. Furthermore, many European MMFs have variable NAVs and other features that make them less vulnerable to pressures from very low interest rates than the stable-NAV euro-denominated funds that have closed to new investments.<sup>17</sup>

Based on the experience of the very low money market rates last year, severe further attrition in the MMF industry as a whole is not a likely outcome of lowering the IOER rate 10 basis points. That said, past might not be prologue; with a cut in the IOER rate, expectations will likely increase that interest rates will remain very low for a protracted period of time, and it is possible that expectations of further cuts in the IOER rate would build. In response to such expectations, sponsors may judge the cost of low revenues from or subsidies for the MMFs they operate not worth the benefit of being able to offer a complete suite of products to investors. If so, sponsors may begin shutting down MMFs rapidly. This outcome is more likely for government-focused funds than for prime funds, as prime funds have somewhat more leeway to take on riskier assets.

The question then becomes whether the supply of short-term credit would be disrupted in the event of widespread MMF closures. It seems likely that, if MMFs are critical to credit intermediation, those borrowing from them will have to do so at rates that will keep the funds viable and prevent credit dislocation. This outcome would likely limit any decline in rates arising from a cut in the IOER rate. If MMFs are not critical for intermediation, the transition to new arrangements for intermediation would likely result in significant closures of MMFs. Such a transition could be messy, take place unevenly, and entail some costs. That said, staff believes that any disruption resulting from a rapid closure of MMFs probably would not be long-lived and would first affect financing intermediated by government-focused funds. Even so, given the high quality of most of the collateral financed by government-focused MMFs, if they begin to close rapidly, it is likely that many institutional investors will enter directly into markets themselves and limit any dislocations in the supply of credit.

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<sup>16</sup> It is unlikely that MMFs would shut down in a disorderly or quick way as sponsors have several options available to them and are likely to proceed in a way that preserves as much reputation as possible: (1) decline to permit additional investments; (2) liquidate; or (3) merge with another vehicle; consolidating funds requires end investor approval, though.

<sup>17</sup> For a more detailed comparison of euro-area and U.S. MMFs see “Contrasting U.S. and Euro Money Funds post ECB Deposit Facility Rate Cut” by John Falcone and John Levy, posted to MarketSource on August 31, 2012.

*Bank Net Interest Income, Deposit Liabilities, and Pricing*

Despite the relatively large absolute level of reserves currently held by banks, the direct impact of a 10 basis point cut in the IOER rate on the banking industry's net interest income is estimated to be relatively small, reflecting both the small size of the rate cut and the relatively small portion of total assets accounted for by reserves. Mechanically applying a 10 basis point cut to the level of reserves implies a reduction in net interest income for banks with domestic deposit insurance of around 0.1 percent, and this does not appear to vary substantially across banks of different sizes.<sup>18</sup> The effect on the interest income of FBOs will likely be greater, reflecting their higher reserve holdings as a share of assets.<sup>19</sup> Given other effects on bank liabilities and assets, however, the overall impact on net interest income is likely to be somewhat less negative and conceivably even net positive. Rates on banks' wholesale short-term liabilities would be expected to decline relatively quickly in response to the IOER rate cut.<sup>20</sup> Banks might also attempt to shift from holding reserves that now yield a lower return into higher-yielding instruments, but in the aggregate they cannot reduce the level of reserves they hold.

Any tendency for cuts in rates on bank deposits to lag behind declines in rates in wholesale funding markets, such as would occur if market rates turned modestly negative and deposit rates did not fall below zero, as well as any actual closures of MMFs due to declining revenue, could encourage inflows into bank deposits.<sup>21</sup> To better manage their balance sheets in the face of such inflows, as well as to maintain profit margins, banks might seek to cut their deposit rates, either effectively through increased fees and charges or through explicit rate cuts, and their doing so would enhance the pass-through from a decline in the IOER rate to market rates generally.

In the past, headline risk has curbed banks' efforts to increase various service charges, and public reaction to explicitly negative rates on deposits could be highly negative. In 2011, Bank of New

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<sup>18</sup> For a discussion of bank net interest income, and recent movements in margins in aggregate and by bank size, see "Banks: Trends in Net Interest Margin Compression" by Sarah Lantz, posted to MarketSource on September 4, 2012.

<sup>19</sup> Quantifying the effect on net interest income is less straightforward for FBOs as the supervisory data they provide is less detailed.

<sup>20</sup> Historically, net interest income has risen in immediate response to cuts in the policy rate, reflecting the direct effects of a decline in the target federal funds rate on banks' short-term funding costs, while rates on their assets, which tend to have longer maturities, fell more slowly. Such a net outcome is possible with a cut in the IOER rate, even in an era where banks are holding substantial reserve assets, so long as reserves still account for a relatively small share of total assets.

<sup>21</sup> Other developments also have the potential for affecting the demand for bank deposits in the near term, potentially in offsetting ways. For example, the expiration at year-end of unlimited insurance on noninterest-bearing transaction deposits under the Dodd-Frank Act conceivably could lead to deposit withdrawals. It is not clear that flows into or out of bank deposits for any of the reasons discussed here would be associated with changes in leverage ratios or the FDIC assessment base, which is total assets less tangible equity, for the entire banking sector, unless banks were also induced, presumably by changing yields, to adjust their total asset holdings.

York Mellon imposed an explicit fee on “excessive deposits” in its custodial accounts in the face of large inflows, but the factors behind these inflows were short-lived.<sup>22</sup> Nonetheless, an explicit reduction in the IOER rate that applies to all banking institutions simultaneously in the context of already very low market rates could create pressure sufficient to overcome previous resistance to negative deposit rates. Moreover, being able to cite a cut in official rates as a direct cause might allow banks to deflect “blame” for their actions. There is some reputational risk for the Federal Reserve associated with negative deposit rates, especially to the extent that retail depositors with few other investment possibilities might be adversely affected, although the potential for negative rates would likely be greater for wholesale depositors.

*Significant erosion in remaining federal funds trading volume*

Even a 10 basis point cut in the IOER rate would increase considerably the risk that the federal funds rate could fall to a level at which the sole remaining investors of significance in this market—the FHLBs—might sharply curtail most of their remaining activity. According to recent anecdotal information, selling by the FHLBs may account for as much as 95 percent of average daily trading volume in the federal funds market. Available evidence suggests that about half of the remainder reflects selling by banks at rates above the IOER rate, likely needed to cover unexpected reserve deficiencies at other depository institutions. While it is not clear what minimum positive federal funds rate is needed to induce FHLBs to lend in this market, as the rate approaches zero they will increasingly prefer to hold reserves at the Federal Reserve that carry no risk rather than lend on an unsecured basis.<sup>23</sup> Even if some residual portion of FHLB activity in the federal funds market were to remain, if reduced sufficiently, when paired with the remaining idiosyncratic bank-to-bank activity, the federal funds rate could react differently to a cut in the IOER rate than other market rates—becoming more volatile and in general being a less reliable indicator of the overall degree of policy accommodation. Conceivably, the federal funds rate could even rise on average, although trading in this market would probably have to shrink dramatically before the small amount of lending by banks at relatively high rates made up a significant share of total trading.

Such an outcome could present a communications challenge for the FOMC. Even if the effective federal funds rate were to be less connected to rates in other market segments, so long as this rate were to remain within its current target range, no change in communication about the operating objective for this rate might be necessary. However, it could have implications for the appropriateness of any recalibration of the target range for the federal funds rate following a cut in the IOER rate.<sup>24</sup> The Committee might also explore setting a target level or range for a

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<sup>22</sup> For a discussion of the circumstances behind this imposition of an explicit fee on deposits, see “BNYM Fee Draws Attention, But Other Custodial Banks Do Not Follow,” by John P. Falcone and Eric LeSueur, posted on MarketSource on September 9, 2011.

<sup>23</sup> In 2011, when the federal funds rate was consistently as low as 7 basis points, the FHLBs continued to invest in federal funds, suggesting that rates would have to fall at least somewhat below that level before the FHLBs would prefer to hold elevated balances at the Federal Reserve.

<sup>24</sup> In the unlikely event that the federal funds rate became idiosyncratic to the point that it were to rise above the upper end of its target range, arranging more repos in accordance with the Desk’s operating directive would probably not be effective in bringing down the rate.

different market rate, or a constellation of rates.<sup>25</sup> Another approach might be to de-emphasize for a temporary period any formal target for overnight rates, highlighting the high degree of policy accommodation that could be confidently expected with a high level of excess reserves in the context of a low IOER rate. Closer to the time when policymakers were first seeking to tighten financial conditions by lifting short-term rates, they may revisit the appropriate choice and setting of an operating target.

### **Conclusion**

Lowering the IOER rate by 10 basis points, to a level of 15 basis points, would likely show through to overnight money market rates, in whole or in part, although given current levels, these rates would not likely turn persistently negative. Modestly negative rates would become much more likely were factors behind the increases in money market rates over the past year to unwind, or if there were a further substantial increase in the level of reserves. Negative market rates, and even yields just being closer to zero, carry some potential for inducing shifts in patterns of financial intermediation in money markets, for increasing pressure on banks to impose negative deposit rates, and for significantly diminishing activity in the federal funds market. In general, the risks of these types of reactions occurring do not seem high, or where they might be, their associated costs seem manageable. That said, the expected economic benefit of a 10 basis point cut in the IOER rate that is fully or mostly passed through to market rates is relatively slight.

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<sup>25</sup> Some possibilities were discussed in a previous memo to the FOMC, "Alternative Interest-Rate Operating Targets," on January 19, 2010 by Tobias Adrian et al.

## **Appendix: Additional Negative Rate Implications**

### *Infrastructure for Negative Rates in the Treasury Market*

The Treasury Department announced in its August 2012 quarterly refunding statement that it is "in the process of building the operational capabilities to allow for negative rate bidding in Treasury bill auctions." Although the Treasury has not made a formal determination to allow negative rate bidding at this time, most of their systems have been certified as ready to support negative rate bidding in bill auctions, with final components expected to be ready by mid-October. The Federal Reserve's automated systems that support the auction and settlement process are also now ready to support negative rate bidding and awards in bill auctions.

The Treasury Department has not publicly indicated that it is considering changing its regulations and systems to allow for negative rate bidding at nominal coupon auctions. Nevertheless, it is expected that only minimal changes to auction systems would be needed to accommodate such a change, since negative rates are already accepted in TIPS auctions. However, it is not clear how much time would be required to completely test the ability to handle negative rates in nominal coupon auctions across all affected systems.

During prior periods of negative secondary market bill rates (late 2008, mid-2011, and late 2011), small volumes were reportedly transacted at negative rates, and contacts did not indicate any problem with their trading, quoting, or clearing systems. Anecdotal reports suggest that not all other markets would be as robust to negative rates, although some market participants are in the process of making necessary systems changes and temporary workarounds are likely available in many cases. For example, some of the GSEs are in the process of adapting their systems to accept negative rates on their discount note programs.

### *Impact of Negative Rates on CBIAS Facilities*

A cut in the IOER rate that led to persistently negative short-term market interest rates could also have important implications for the provision of banking and custody services to foreign and international monetary authorities (FIMA) by the Federal Reserve through its Central Bank and International Account Services (CBIAS) function. Keeping a zero floor on the rates for FIMA deposit accounts and for the overnight investment facility (i.e., the Foreign Repo Pool) would encourage FIMA customers to place much higher funds with the Federal Reserve. But there are significant hurdles to applying a negative rate to the Repo Pool, including the need to amend all the existing account agreements with participants in the Foreign Repo Pool, as currently these agreements only reference the ability to credit accounts for income earned and not the ability to debit accounts.<sup>26</sup> Moreover, doing so might be ineffective in the absence of also being able to impose a negative rate on FIMA deposit accounts. A different approach could be to attempt to impose a cap on FIMA customer Foreign Repo Pool participation and cash balances. But given

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<sup>26</sup> The application of a negative rate to FIMA customers might be inconsistent with how other central banks, namely the euro-zone national central banks (NCBs), have treated central bank deposits at their institutions, including those of the Federal Reserve and Treasury Exchange Stabilization Fund. As the reference rates for NCB euro-denominated deposit services for foreign central banks have gone negative, the NCBs have applied a zero floor to the rates they offer to their official sector customers.

the circumscribed ability of CBIAS to forcibly turn away funds from customer accounts, this approach would require a degree of moral suasion with customers to implement and guard against unwanted use.

