

## US Rates Strategy Notes

### Fed funds and repo rates headed lower

- **Fed funds effective 5bp lower** – Over a 9 month period we expect the Federal Reserve to expand reserves by around \$570bn. Historically \$100bn in reserve expansion has been worth 1.2bp lower fed funds effective, but this relationship is likely weaker due to already substantial reserve balances. We also expect the GSEs to maintain or increase their preference for liquidity, putting further downward pressure on fed effective. These factors should drive fed effective 5bp lower.
- **Tsy repo to stabilize around 15bp** – Since the beginning of operation twist short dated paper has built up on dealer balance sheets. Balance sheet constraints at the largest dealers have led them to step away from the market and a 6bp spread has opened up between treasury GC repo and fed effective. We expect this spread to compress in the months following the expiration of twist in December. The spread compression together with the decline in fed effective should take treasury repo to around the 15bp level by the end of 1H 2013.

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**Andrew Hollenhorst**

+1-212-723-3623

[andrew.hollenhorst@citi.com](mailto:andrew.hollenhorst@citi.com)

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# Fed funds and repo rates headed lower

## The fed funds market

**Fed funds effective to drop 5bp on increased total reserves and increased selling demand from GSEs.**

Since the beginning of 2012, the 20 day moving average federal funds effective rate (FF) has backed up 8bp to its current 15bp level. While in the near term fed funds will likely move only 1-2bp lower, we expect FF effective to drop about 5bp through the first half of 2013, driven by reserve creation under QE3 and increased interest in selling FF by GSEs.

Over the last three and a half years, FF has traded in a range between 0 and 25bp. (Figure 1) The Fed pays interest on reserves held at the Fed (IOR)<sup>1</sup> of 25bp to banks and certain other depository institutions. No bank should then be willing to receive less than 25bp on FF lent to others, making 25bp a theoretical floor on the FF rate if all actors in the market were eligible to receive IOR. GSEs (FNMA, FHLMC, and FHLBs) are not paid IOR and are willing to lend funds at below 25bp, which drives FF below 25bp.<sup>2</sup>

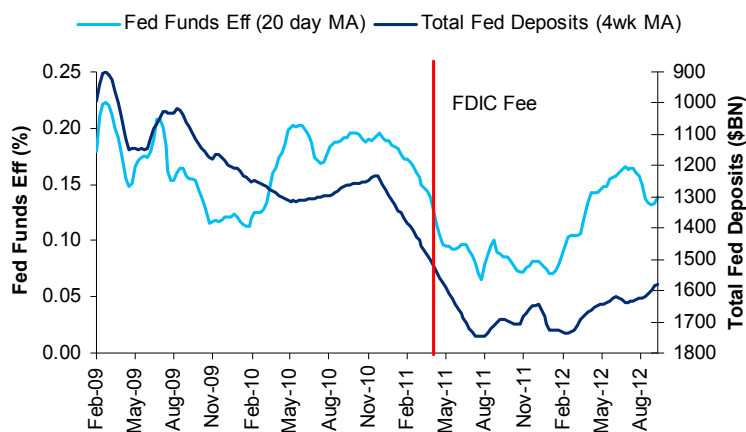
## Fed funds to decline by 5bp through 1H 2013

Given this market structure, an increase in total reserves coupled with GSEs tilting portfolios toward more liquid assets will take Fed funds 5bp lower.

**\$570bn in new reserves over 9 months is worth about 7bp based on history, but the impact will be muted by already large balances.**

**\$570bn in new reserves** – In our baseline scenario the Fed will continue its \$40bn/mth in MBS purchases at least through the next 9 months and add \$35bn/mth in unsterilized treasury purchases when operation twist (OT) expires in December, implying \$570bn in Fed balance sheet expansion. Prior to 2008 the Fed actively managed total reserves to keep the effective funds rate close to its target. In textbook economics fashion, increasing the supply of reserves would drive down the rate. With FF trading below 25bp already, this transmission mechanism is extremely muted, but on the margin GSEs with funds to lend will face a market even more flush with funds, putting downward pressure on rates.

Figure 1. Fed Funds has moved lower as total Federal reserves have expanded

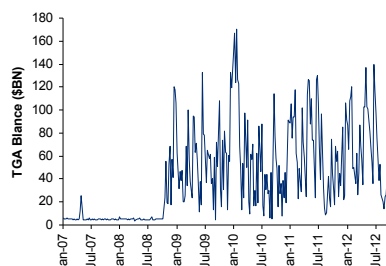


Source: Citi Research, Bloomberg, Haver. FDIC began assessing fees on Fed funds in April 2011.

<sup>1</sup> The Fed currently pays interest on both excess and required reserves.

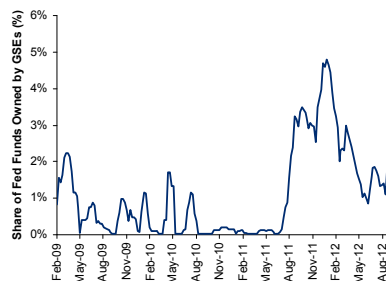
<sup>2</sup> Theoretically an institution that needs to borrow Fed Funds may be willing to borrow at a rate higher than 25bp, and such transactions do occur as evidenced by daily trading range highs, usually around 38bp over the last year. However, the large expansion in total reserves since 2008 has made such transactions relatively less frequent. In a [2009 FRBNY working paper](#), Bech and Klee conclude that for much of the period from January 2009-July 2009 50% of trades have occurred below 25bp and for around half the days considered this ratio is above 80%.

**Figure 2. Volatile Treasury holdings of Fed Funds have had little impact on the market**



Source: Citi Research, Haver Analytics

**Figure 3. GSEs have increased reserves held at the Fed**



Source: Citi Research, Haver. GSE share is computed from Fed H.4.1, Table 8, category "Other" which mainly represents GSEs. 4 week average.

Since 2009, the empirical relationship between fed funds effective and total reserves of depository institutions suggests each \$100bn increase in reserves is worth about 1.2bp lower in FF. (Figure 1) This suggests the reserve expansion will lower FF by as much as 7bp. However, this is likely an overestimate as the already large reserve balances have likely decreased the marginal impact of adding reserves. An indication that this is the case is that weekly swings of up to \$100bn in the US Treasury's reserve holdings, which effectively drain or add reserves to the bank sector, have led to little if any discernible effect on FF effective.<sup>3</sup> (Figure 2)

**Larger GSE Liquidity Portfolios** – Despite not being eligible for IOR, GSEs keep reserves at the Fed to make principal and interest payments in the case of FNMA and FHLMC and to warehouse liquidity ahead of advancing it to member banks in the case of FHLBs. Since August 2011 GSEs have held a larger than usual share of FF deposits, peaking at close to 5% in February and today at close to 2%. (Figure 3) We think this dynamic will continue, and perhaps increase for three reasons.

1. **FHFA Regulation** – The FHFA has put increasingly strict requirements on FNMA and FHLMC liquidity portfolios. These rules mandate that the GSEs must hold cash like securities equal in value to, for instance, "50% of average projected cash needs over the previous three months."<sup>4</sup> This increases the total supply of Fed Funds held by GSEs and puts downward pressure on the rate at which they can be sold.
2. **Portfolio Runoff** – Both FNMA and FHLMC have been instructed to run off their retained portfolios, currently a combined \$1.2trn, at 15% a year. This works out to \$135bn in proceeds that won't be reinvested in long term securities over the next 9 months. While proceeds from these sales don't need to stay in Fed funds and will ultimately be offset by negative net debt issuance, they will likely temporarily increase GSE reserve holdings.
3. **US Fiscal Uncertainty** – In response to the 2011 debt ceiling crisis, GSE's shifted funds toward more liquid investments on concerns that US, and hence GSE, credit ratings could be negatively impacted.<sup>5</sup> With the debt ceiling forecast to bind in late 1Q 2013, a replay of these concerns and the corresponding increase in GSE liquidity portfolios is increasingly likely.

The expansion of reserves is worth 7bp in lower FF effective based on history but we would shade this number significantly lower since we think the marginal impact of additional reserves is lower. On the other hand, increased supply of Fed Funds from GSEs argues for slightly larger decrease in FF effective. On balance, we think FF effective will fall about 5bp through June 2013.

<sup>3</sup> The Treasury maintains the Treasury General Account (TGA) at the Fed for depositing tax receipts and making disbursements. Prior to the recent balance sheet expansion, the level of reserves in this account was kept stable at around \$5bn so as not to disrupt the Fed's adjustment of total reserves to keep FF effective close to its target. Post-crisis, the TGA has allowed these reserves to fluctuate. A regression of FF rate changes on changes in TGA balances yields a coefficient close to zero, as does an instrumental variables specification where TGA balances are used as an instrument for depository institution balances.

<sup>4</sup> See FHLMC's 2012 Q2 10-Q.

<sup>5</sup> From FHLMC's 2011 10-K: "As a result of the potential that the U.S. would exhaust its borrowing authority under the statutory debt limit and market concerns regarding the potential for a downgrade in the credit rating of the U.S. government, beginning in the third quarter of 2011, we changed the composition of our portfolio to hold more cash and overnight investments."

## Repo rates to close the gap with fed funds

**Repo-FF spread has widened as dealer balance sheets are clogged with short dated paper.**

**Larger dealers are balance sheet constrained.**

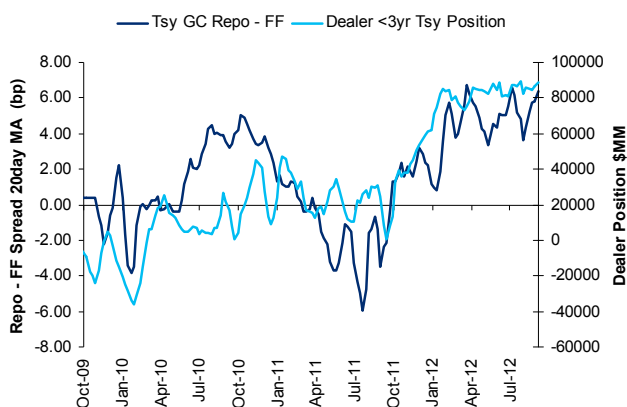
**GC tsy repo should settle near 15bp by end of 1H 2013.**

The spread between repo and FF effective is currently at a recent high of just over 6bp. This differential would usually be arbitrated away by dealers who can access both markets. However, since October 2011 when the Fed began OT, short dated paper has been building up on dealer balance sheets, leaving dealers little room to extend repo financing and drive repo rates more in line with FF. (Figure 4)

This explanation is born out by data from the tri-party repo market that shows that the market share of the top 3 dealers in repo financing of treasuries declined from between 40-50% of the market to around 30% of the market, coincident with the increase in short dated paper. (Figure 5) This indicates that balance sheet constraints have pushed those who want to repo out securities in the tri-party market to trade with smaller dealers who offer higher rates.

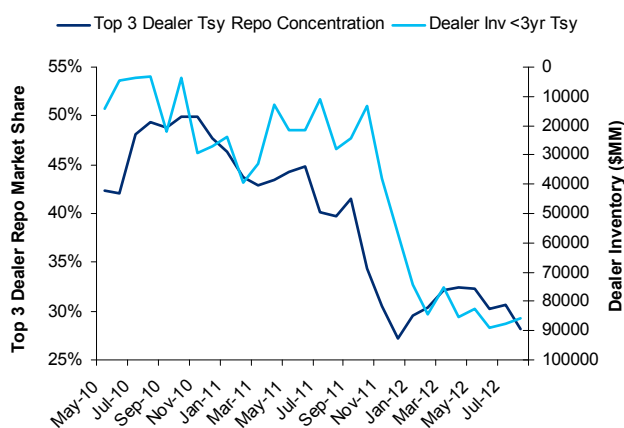
We expect the repo-FF dislocation to move back in line after December when the Fed is scheduled to end its front end sales under OT. This should bring repo rates down 6bp relative to fed funds. Adding this to our forecast of a decline of 5bp in fed funds puts the 20 day MA treasury repo rate 9 months from now at 15bp.

**Figure 4. Repo-Fed funds spread increased as short end inventory limits arbitrage**



Source: Citi Research, Bloomberg, Haver Analytics. Repo and FF rates are 20 day moving averages.

**Figure 5. Constrained dealer balance sheets have pushed tri-party repo activity away from the largest dealers**



Source: Citi Research, FRBNY, Haver Analytics. Market share is share of tri-party market.

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