Should the Fed samba?

The recent release of the June 2014 FOMC minutes has reignited interest in how the Federal Reserve intends to exit its unconventional policy in general and what will be the role of reverse repos in particular. Despite market commentary suggesting that the Fed's technical exit task is daunting and novel[1], tightening the supply of bank reserves is—in fact-- conceptually quite simple with ample worldwide precedents conducted under more difficult financial circumstances than the Fed faces today.

Since I wrote about exit modalities last summer (see "Orchestrating the Exit", http:// bit.ly/19yzjZS), there has been considerable discussion and some confusion surrounding the Fed's intention to use reverse repos, notwithstanding Simon Potter's excellent speech to the Money Marketeers of NYU last December.[2] This current note is intended to provide a bit more clarity to the issue by considering the Central Bank of Brazil's monetary operations framework. This framework relies quite heavily on liquidity absorbing repos (LAR)[3] to manage bank reserves and, thereby, short term interest rates. In discussing the logic and advantages associated with the Brazilian operational framework I answer the rhetorical title of this note in the affirmative—the Fed should learn to do the samba.[4]

Modern monetary operations frameworks—including that of the pre-crisis Federal Reserve for at least two decades—center on the provision of reserves to the financial system at an interest rate determined by the central bank. Although this concept is widely misunderstood it should not be. Basic economic theory states that not even a monopolistic supplier may control both quantity and price simultaneously. Slightly more advanced theory is rather conclusive that using market determined prices to allocate resources is superior to quantity rationing. Consequently, it should not be difficult to understand that central banks almost universally act to set a price target (a short term interest rate) by providing the financial system the quantity of reserves desired at that price. That is:

"In designing open market operations, the Desk aims to satisfy banks' preferences for holding Fed balances on a daily basis, as suggested by historical patterns and as revealed by rate pressures evident each morning, consistent with their maintenance period-average demands".[5]

The exit challenge facing the Fed is how to raise rates when, as an unintended consequence of large scale asset purchases (LSAPs), the financial system holds reserves far in excess of the quantity it desires. Exactly how much is difficult to say but the quantity is surely in the trillions of dollars. In 2007 the FRB of New York estimated that banks had a minimum desired level of reserve deposits of $10 billion.[6] Post crisis perhaps this number is closer to $ 250 billion but that still would place the system with approximately $ 2.5 trillion in "excess" reserves.

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[1] E.g., "The process of draining the liquidity back out will be an unprecedented macroeconomic experiment", Eric Veiel, manager T. Rowe Price's Financial Services Fund, Winter 2014 issue of the *T. Rowe Price Report*.

[2] Available at http://www.newyorkfed.org/newsevents/speeches/2013/pot131202.html.

[3] From this point I will refer to what the FR calls "reverse repos" as "LAR" and to what the FR calls "repos" as "LPR" or "liquidity providing repos". Consequently, LAR are liabilities of the FR and LPR assets.

[4] Although I had been intending also to make allusions to the desirability of playing football Brazilian style, even casual observers of the 2014 World Cup will understand why that idea became a victim of collateral damage. For a taste of samba, try João Gilberto and Stan Getz's bossa nova version of "The Girl from Ipanema".

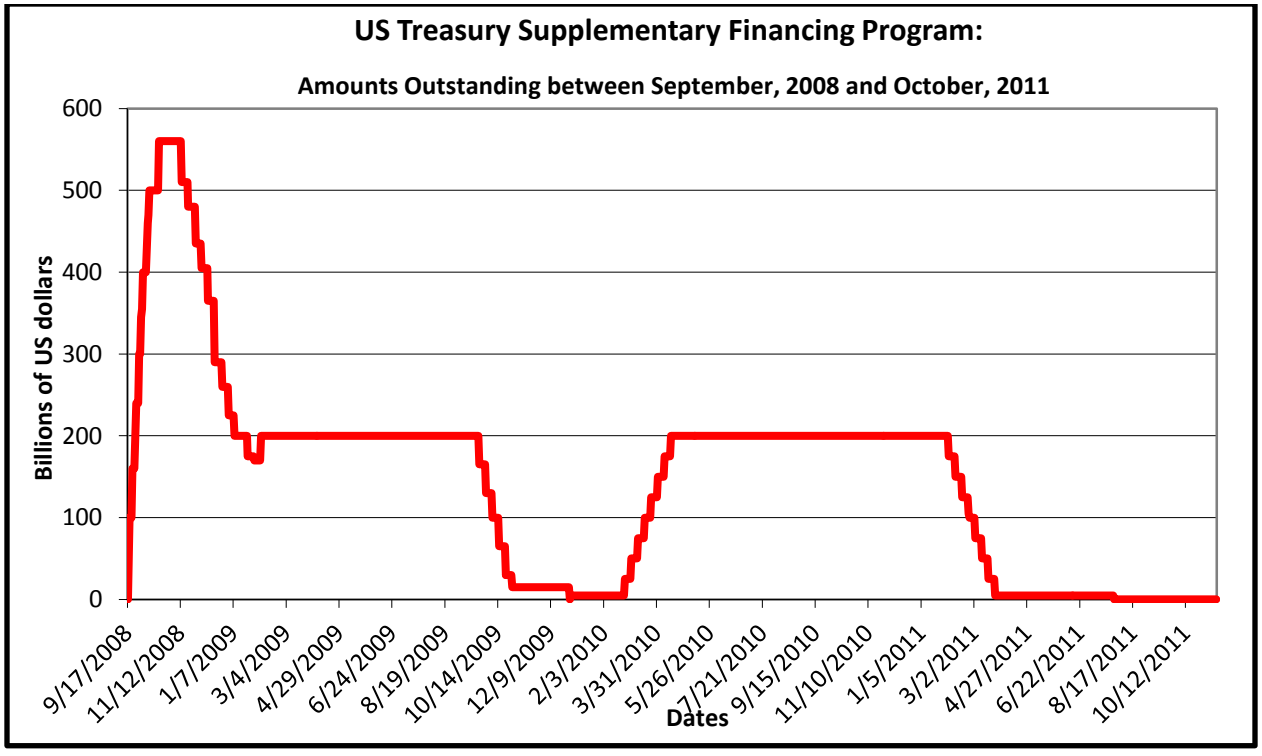
[5] FRBNY "2007 Domestic Open Market Operations", page 8.

[6] Ibid, page 7. Daily average reserve holdings pre-crisis were closer to $20 billion.

The many central banks who have found themselves historically with large expansions in their balance sheets—owing to intervention during financial crises and/or large foreign exchange purchases—have not resolved the situation through asset sales but with transformations of the liability side of their balance sheets. In other words, bloated balance sheets are extremely difficult to shrink.[7]

Transforming central bank liabilities from bank reserves to longer term obligations essentially comes in two flavors—central banks who issue their own debt securities, a bad idea and one the Fed fortunately rejected when it was mooted in late 2008—and alternative instruments, among which the most common are government deposits, bank time deposits (either required by law or freely auctioned) and LAR using government securities. Essentially the Fed is deciding between time deposits and LAR.

Although the US Treasury did assist the Fed to absorb liquidity with its Supplementary Financing Program, this modality proved unrealiable owing to the US Federal gross borrowing limit. As may be seen in the chart below, the supplemental amount of US Treasury deposits held at the Fed fell dramatically both times the Treasury approached the US debt ceiling. Naturally the Treasury could not credibly request an increase in the debt ceiling—by implicitly threatening default—while it held significant deposits at the Fed. After the first post-crisis increase in the debt ceiling, in 2010, it is evident the Treasury resumed its liquidity absorption on behalf of the Fed. After the second "crisis", in 2011, the Treasury evidently decided to suspend the program, nor was it needed given the then consensus belief that the Fed would live with excess reserves for an extended period of time. Thus, this instrument—so effectively employed in countries as diverse as Brazil, Singapore, Mexico and Israel—is unlikely to be available to US macro policymakers.



Source: US Treasury website and author's calculations.

[7] Of the many examples I could cite, consider the Central Bank of Chile's excessive balance sheet dating from 1982.

Brazil

Brazil passed through the stage of central bank debt. Decades of central bank quasifiscal operations, crises interventions and foreign exchange accumulation left the Central Bank of Brazil in the 1990s heavily indebted and in an effort to contain its losses--imposing high and distorting reserve requirements, i.e. imposing the inflation tax on financial institutions, aka "financial repression". The Brazilian Treasury, through the 2000 Fiscal Responsibility Act, took dramatic action to eliminate the bifurcation in the domestic debt market resulting from the circulation of both central bank and treasury securities. The Law forbade the central bank from issuing its own debt instruments starting two years from the passage of the law. Although Brazil continues to impose high reserve requirements, LAR replaced central bank debt securities as the primary monetary operations instrument, an instrument that proved its mettle during the recent years of heavy foreign exchange accumulation.

Brazil's reliance on LAR is shown below:

			Central Bank of Brazil: Distribution of Liquidity Absorbing Repos at end 2013					
				(in billions of Reais)				
			Up to 1 month	1-6 months	6-12 months	1-5 years	> 5 years	Total
Maturity of Repos			481.7	76.3	11.3			569.3
Maturity of Underlying Instruments				63.7	103.6	230.6	138.6	536.5
(collateral provided)								
Source: Banco Central do Brasil Financial Statements December 31, 2013								
			Central Bank of Brazil: Distribution of Liquidity Absorbing Repos at end 2013					
				(in billions of US$)				
			Up to 1 month	1-6 months	6-12 months	1-5 years	> 5 years	Total
Maturity of Repos			205.6	32.6	4.8			243.0
Maturity of Underlying Instruments				27.2	44.2	98.4	59.2	229.1
(collateral provided)								
Source: Banco Central do Brasil Financial Statements December 31, 2013 and author's calculations								
			Central Bank of Brazil: Distribution of Liquidity Absorbing Repos at end 2013					
				(in percent of GDP)				
			Up to 1 month	1-6 months	6-12 months	1-5 years	> 5 years	Total
Maturity of Repos			9.9	1.6	0.2			11.7
Maturity of Underlying Instruments				1.3	2.1	4.8	2.9	11.1
(collateral provided)								
Source: Banco Central do Brasil Financial Statements December 31, 2013; Economic Indicators; and author's calculations								

There are a number of important facts to glean from the Brazilian operational framework:

- The maturity structure of LAR need not be related to the maturity structure of the underlying collateral—an overnight LAR may provide a 5 year bond to the market

- The bulk of the LAR is for a period of less than one month (the average maturity of LAR has fallen to as low as 18 days) while the bulk of collateral consists of bonds with a maturity > 1 year

- The value of the collateral is less than the value of the LAR as the central bank provides collateral with a standard 2 percent haircut[8]

- The total value of short term LAR (less than one month) is "large", 10 percent of GDP

- The total value of LAR is "large", 12 percent of GDP

- Although a repo is legally a sale and repurchase transaction, accounting convention is to treat LAR as collaterized borrowing. Consequently the securities provided as collateral by the central bank remain on the asset side of the balance sheet. An increase in LAR is reflected only on the liability side of the balance sheet—bank deposits fall and LAR rise by an offsetting amount. Contrast this with an outright sale of a central bank security—that "textbook" open market operation (not a single such sale was undertaken by the pre-crisis Fed for almost 20 years!) results in a decline in securities held (asset side) and a decline in bank reserves (liability side)

- Although the volume of *overnight* LAR may be "small", the Brazilian policy target (set by the COPOM) is the SELIC rate—the interest rate for *overnight interbank loans collateralized by government bonds* registered with and traded on the Sistema Especial de Liquidação e Custódia. The SELIC target is fixed for the period between regular COPOM meetings

- Excluding Treasury deposits, about half of the CBB's total liabilities are LAR (see chart below)

- The CBB has absorbed the purchase of about US$ 291 billion since end-2006 primarily using LAR

Central Bank of Brazil Balance Sheet
(end 2013 in percent of GDP)

Net Foreign Assets	18.0		Banknotes and coin	4.2
Federal Securities	19.7		Treasury Deposits	14.2
Net Other Assets	0.5		Bank & other FI Dep	7.6
			Liquidity absorbing repos	11.8
			Equity	0.4
Total Assets	38.2		Total Liabilities	38.2

Source: Banco Central do Brasil Financial Statements December 31, 2013; Economic Indicators; Author's calculations

[8] In market-based repo, the cash borrower provides collateral in excess of the amount borrowed—the *lender* imposes a haircut on the collateral value to manage risk. In the case where the central bank is the cash borrower, there is—of course—no risk that the lender will not receive its cash "back" since the central bank merely creates it through its electronic book entry system. Consequently the central bank may provide less (or indeed no) collateral.

Returning now to the issue of *why* Brazil adopted a clear strategy to replace central bank debt securities with treasury securities. As noted above, this eliminated the bifurcation in the domestic sovereign debt market and brought the country's debt strategy under the management and strategic development of one issuer—the Treasury. The use of LAR in monetary policy allows the central bank a wide degree of flexibility in designing its liquidity absorption strategy—the duration of the instruments is determined entirely by the central bank—while avoiding any impact on the secondary market price of treasury debt that would be associated with outright sales and purchases. Furthermore, the Central Bank of Brazil explicitly allows securities obtained in LAR to be sold and traded by the market…as is customary in repo markets. Consequently the CBC's liquidity absorbing repos have provided an enormous amount of collateral to the Brazilian Treasury securities market facilitating secondary market trading and market deepening. This was particularly important in the long part of the yield curve as previously trading was limited owing to the buy-and-hold behavior of a number of institutional players, e.g. pension funds.

Federal Reserve

The table below provides the current consolidated Federal Reserve Banks balance sheet organized for ease of comparison with that of the Central Bank of Brazil.

Consolidated Federal Reserve Banks Balance Sheet
(as of June 4, 2014 in percent of GDP)

Net Foreign Assets	0.1		Banknotes	7.1
Treasury, Agency, MBS	24.3		Treasury Deposits	0.2
Net Other Assets	0.2		Bank & other FI Deposits	15.7
			Liquidity absorbing repos	1.3
			Equity	0.3
Total Assets	24.6		Total Liabilities	24.6

Source: Federal Reserve Statistical Release H.4.1; International Monetary Fund, World Economic Outlook Database, April 2014; Author's calculations

A few important points:

- Since the Fed has not intervened in foreign exchange markets for decades, it is not surprising that it holds virtually zero foreign reserves[9]
- Treasury deposits are much smaller in the US than in Brazil. At the peak of the SFP, UST deposits at the Fed amounted to about 7 percent of GDP
- Bank deposits at the Fed are much larger than in Brazil despite required reserves being much higher in the latter

[9] The US Treasury Exchange Stabilization Fund holds foreign reserves equal to those on the Fed balance sheet.

- LAR are about 10 times higher in Brazil—as a percent of GDP—than in the US

From a bird's eye conceptual view the operational aspect of the exit will entail managing the transition from the balance sheet shown above to the one shown below "dated" 2020. Assuming the Fed would allow some asset shrinkage owing to "natural" causes, that is, the amortization of some of the Treasury and MBS securities currently in its portfolio, the ratio of those securities to GDP is assumed to fall to 22.3 .[10] In that case, assuming banknotes, Treasury deposits and equity remain unchanged with respect to GDP, the lines "bank and financial institution deposits" plus "LAR" would need to sum to 15 percent of GDP. Assuming further that the Fed and market arrived at 0.5 percent of GDP as an appropriate level of overnight deposits for smooth operation of the payments system (about $ 800 billion), this would reduce the operational task to dividing the residual 14.5 percent of GDP into LAR and time deposits.

Consolidated Federal Reserve Banks Balance Sheet
(Hypothetical 2020 in percent of GDP)

Net Foreign Assets	0.1		Banknotes	7.1
Treasury, Agency, MBS	22.3		Treasury Deposits	0.2
Net Other Assets	0.2		Financial Inst o/n Dep	0.5
			Time Dep + LAR	14.5
			Equity	0.3
Total Assets	22.6		Total Liabilities	22.6

In deciding the division between time deposits and LAR, the case of Brazil demonstrates that a heavy reliance on LAR is both possible and desirable. Compared with time deposits, which presumably could neither be traded among banks nor between banks and nonbanks, LAR provide an enhanced ability to distribute liquidity within money, collateral, and debt markets. Furthermore, LAR provide the central bank unsurpassed operational flexibility regarding the duration of its liquidity absorption instruments without any deleterious impact on secondary market prices. Lastly, the ability of the Fed to operate at different maturities and with alternative collateral instruments provides both an easy transition—should it be desired—to a collateralized operational target (as in Brazil) as well as important direct insight into an expanded market of financial instruments than it had pre-crisis. This capacity may become an important element of the nascent introduction of macroprudential tools.

Central banks tend to be slow but steady innovators. Brazil is an exception rather than the rule. The ideas provided here may take time to be absorbed and introduced. But in the meantime I do not think there is any danger to our all signing up for some samba lessons.

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July 2014
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[10] Shrinkage in the ratio to GDP would also occur under a full reinvestment policy owing to GDP growth.