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**Paying Interest on Reserve Balances:
It's More Significant Than You Think**

by

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Paying Interest on Reserve Balances: It's More Significant Than You Think

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It has long been recognized that uncompensated reserve balances act like a tax on banks and that banks as a result expend scarce resources to avoid holding them. The Fed itself has historically supported legislation to enable it to pay interest on reserve balances (e.g., Kohn 2003), as have economists (e.g., Goodfriend 2002), both for reasons of economic efficiency and to improve the implementation of monetary policy. The traditional argument against interest payment has been that it would reduce the Fed's earnings that are subsequently turned over to the Treasury (Feinman 1993b; Abernathy 2003). The purpose of this paper is to demonstrate the implications of paying interest on reserve balances on the daily operations of both the Fed and the Treasury. While the arguments here—for different reasons—generally are in favor of enabling the Fed to pay interest on reserve balances, more important than the actual payment of such interest is the perspective gained when considering in detail the operations of both in an environment where reserve balances earn interest.

The Accommodative Nature of the Fed's Operations and Interest Payment on Reserve Balances

In the federal funds market banks borrow and lend reserve balances held in reserve accounts at the Fed; most of the trades are accomplished either through pre-existing lines of credit or arranged via brokers. The Fed uses open market operations, overdrafts (provided automatically *whenever* a bank's reserve account moves into negative balance), and overnight loans to ensure the quantity of reserve balances circulating is such that the federal funds rate remains as close as possible to the FOMC's target rate. Since reserve balances are liabilities on the Fed's balance sheet, banks in the aggregate have no effect upon their quantity; by definition, only changes in the Fed's balance sheet can alter the quantity of reserve balances.²

The Fed's necessary accommodation of the demand for reserve balances is obvious when one considers daily operations in the absence of reserve requirements. Without reserve requirements, banks hold non-interest-bearing reserve balances only to settle payments such as checks drawn on customer accounts or Fedwire funds transfers for direct payments to other banks, the Treasury, or as settlement of netted clearinghouse transactions. In order to avoid the Fed's overdraft charges (discussed in Fullwiler 2003), banks desire to hold sufficient reserve balances to settle their net payment commitments for the day. A bank holding less than this amount would attempt to borrow more reserve balances, while one holding more would attempt to lend the excess. In the aggregate, too many or too few reserve balances circulating leads to wide swings in the federal funds rate since such lending/borrowing among banks does not affect the aggregate quantity of reserve balances. Too few balances could also threaten the smooth functioning of the payments system, which the Fed is charged in the Federal Reserve Act with protecting. Larger quantities of reserve balances do not "fund" more money creation since there is no *operative* constraint on bank lending beyond the existence of willing, creditworthy borrowers. In other words, loans create deposits while reserve balances *only* settle payments (Moore 1988; Wray 1998, 2003-4; Fullwiler 2003).

Adding reserve requirements is simply one way to reduce potential volatility in the federal funds rate. First, reserve requirements require banks to hold more reserve balances and thereby reduce the likelihood of overnight overdrafts. Second, because reserve requirements are met on average across a lengthy maintenance period, deficiencies or surpluses on most days can be offset later in the maintenance period. Together these provide “room for error” for the Fed as it attempts to correctly forecast the demand for reserve balances at the target rate (Fullwiler 2003). However, reserve balances still do not “fund” money creation and are still necessarily supplied endogenously to accommodate banks’ demand for them—albeit as a daily average across the maintenance period.

Concerns expressed in recent years about increased variability in the federal funds rate due to falling required reserves (reviewed in Fullwiler 2003) or due to e-money-related innovations to the payments system (reviewed in Fullwiler 2004) often did not consider the regulatory factors enabling such volatility in the first place. Specifically, the possible range of variability in the federal funds rate is determined by the spread between the rate the Fed pays on reserve balances and the rate the Fed charges for overnight overdrafts (hereafter, referred to as simply the “spread”). As reserve balances have historically been non-interest bearing while the Fed also strongly discouraged borrowing at the discount window to cover an overdraft (which themselves carry significant penalties if not covered by the end of the business day), the “spread” has effectively been very wide. The Fed had earlier relied on reserve requirements and its ability to correctly forecast the demand for reserve balances to keep federal funds rate volatility at manageable levels, though the volatility became less manageable in the late 1990s as banks avoided reserve requirements through use of retail sweep accounts and the demand for reserve balances became more closely tied to less predictable settlement needs (Fullwiler 2003). Narrowing the “spread” itself—by providing overnight loans to any bank at a modest penalty above the target rate and paying interest on reserve balances at a discount below the target rate—is more direct and more effective at reducing volatility, as nations that have eliminated reserve requirements have shown (Woodford 2001).

In January 2003 the Fed abandoned its traditional discouragement of borrowing at the discount window; the Fed now lends to any qualifying bank desiring a loan at the primary lending rate, set as a one percent penalty above the federal funds rate. In its first year, the primary lending rate was predictably “effective in limiting increases or capping the fund rate on days when strong upward pressures did emerge”³ (Federal Reserve Bank of New York 2004, 24). Paying interest on reserve balances—at a rate set some fixed magnitude below the FOMC’s target—would obviously further contain potential volatility in the federal funds rate by setting a floor on how low the federal funds rate could fall. A substantially reduced “spread” in which the Fed set both “bid” and “ask” rates on federal funds would effectively make the Fed a real-time market maker in the federal funds market and would be the monetary policy implementation procedure most consistent with the Fed’s necessary accommodation of the demand for reserve balances.

That reserve balances only settle payments or meet reserve requirements means that the demand for them is insensitive to changes in the federal funds rate. Though there is overlap, this point can be separated from variability in the federal funds rate, whose potential is determined by the width of the “spread.” Due to this inelasticity, the Fed is able to alter the federal funds rate without altering the quantity of reserve balances at all, regardless of the width of the “spread”⁴ (Krieger 2000; Fullwiler 2003, 2004). With interest-bearing reserve balances, clearly the Fed could simply alter both the primary lending rate and rate paid on reserve balances together to move the federal funds rate to a new target. This would again be consistent with the Fed’s preferred practice of simply announcing a new target rate and preferable to earlier times (pre-

1994) when federal funds traders learned of a new target through the Fed's "signals" sent via open market operations that would later be offset (Feinman 1993a; Fullwiler 2003).

In summary, as the Fed itself argues, its ability to manage the federal funds rate would be simplified through interest payment on reserve balances. More importantly and much like consideration of the Fed's operations without reserve requirements, considering monetary operations with a narrow "spread"—where reserve balances are interest bearing—is a useful starting point—or even general case—for understanding their nature. With a narrow "spread," the Fed accommodates the demand for reserve balances in real time and is able to adjust the federal funds rate target without additional operations by simply raising or lowering the "bid" and "ask" rates on reserve balances. There is no question that the Fed can achieve the federal funds rate target with minimal volatility and also alter the target as desired via announcement. With a wide "spread," Fed operations must anticipate banks' demand for reserve balances to avoid swings in the federal funds rate. Nonetheless, changes to the federal funds rate target even with a wide "spread" require essentially no change to reserve balances since banks *can do nothing more* than settle payments and meet reserve requirements with them. Because the general and special cases have been historically confused, economists have been led to publish volumes of research on deposit multipliers, liquidity effects, and the possibility that the Fed might not be able to manage volatility in the federal funds rate.

The Offsetting Nature of the Treasury's Security Operations and Interest Payment on Reserve Balances

As a liability on the Fed's balance sheet, changes to the Treasury's account necessarily and *by definition* change the quantity of reserve balances circulating, *ceteris paribus*. That is, reserve balances increase *whenever* the Treasury spends and decrease *whenever* the Treasury receives a payment. Daily net flows to/from the Treasury's account as credits/debits to bank reserve accounts are substantial and are regularly the largest and least predictable of all changes to the Fed's balance sheet (e.g., Meulendyke 1998; Federal Reserve Bank of New York 2004). The Treasury has historically manipulated balances held in correspondent accounts at thousands of banks across the country—called Treasury Tax and Loan (hereafter, TT&L) accounts—to offset net changes to its account and to thereby minimize the net impact upon reserve balances (Lovett 1978; Hamilton 1997; Meulendyke 1998; Wray 1998; Bell 2000; Bell and Wray 2002-3; Fullwiler 2004). From the logic of the Fed's balance sheet, absent Treasury transfers to and from these accounts to offset daily net flows to/from the Treasury's account, the Fed itself would be required to carry out operations of the same size to accommodate the demand for reserve balances and achieve the FOMC's target. Indeed, during 1974-1977, there was no TT&L system and the Fed's daily operations became significantly more complicated as a result (Lovett 1978).

To support the Fed's operations, TT&L balances are called in to offset Treasury induced modest and temporary net additions to reserve balances. Operationally, when larger or more permanent net additions to reserve balances are made by the Treasury, offsetting sales of bonds are used to drain the reserve balances. Treasury bond sales have thus been referred to as "interest rate maintenance operations" (Mosler 1995; Wray 1998) since—just as without the TT&L system for smaller and shorter-term deficits—without them it would be necessary for the Fed itself to drain the same quantity of reserve balances through open market sales to support a non-zero federal funds rate target. Instead of the complexities of the TT&L system and bond sales, the more direct and more efficient method of interest rate support would be for the Fed to simply pay interest on reserve balances. With interest-bearing reserve balances (IBRBs), absent offsetting Treasury or Fed operations to drain excess balances created by a deficit, the federal funds rate would simply settle at the rate paid on reserve balances. The nature of Treasury bond sales as

offsetting, interest-rate support rather than finance would be obvious. While the private sector is offered an interest-bearing liability of the government in the presence of a deficit to support a non-zero interest rate target, this does not necessitate that the Treasury sells bonds.

Such actions are sometimes feared to undermine the independence of monetary policy by creating excess balances, though with IBRBs replacing bond sales the Fed's independence and ability to exogenously adjust the federal funds rate target would be uncompromised and would simply require increasing or decreasing the rate paid on IBRBs. Regardless of the quantity of excess balances, the federal funds rate would not fall below this rate and would continue to influence other rates in the economy via arbitrage since banks use reserve balances to settle their customers' tax liabilities (Fullwiler 2004). Holders of deposits so desiring could convert to short-term, private liabilities—just as they can now—the rates for which would be set primarily via arbitrage with the Fed's target. Long-term rates—just as now—would be largely dependent upon the current and expected future paths of short term rates. Those desiring fixed- instead of flexible-rate investments—perhaps banks holding IBRBs—could do so through swaps that would be priced similarly. Without Treasuries, government agency securities and swaps could emerge as benchmarks for pricing of private assets, as is increasingly the case already and for which they are better suited than Treasuries anyway. In sum, with a deficit the transmission of monetary policy via IBRBs is identical to that with non-interest bearing reserve balances (NIBRBs) and bond sales to drain excess balances.

With IBRBs, all Treasury securities could eventually be replaced; the interest rate on the national debt would then be the rate paid on IBRBs. Treasury securities themselves are simply fixed-rate liabilities and from the private sector's perspective not functionally different from IBRBs aside from the flexible-rate nature of the latter. Note that consideration of IBRBs demonstrates how interest on Treasury debt is determined: with IBRBs and no securities issued, the interest rate is the rate paid on IBRBs; where short-term securities are issued, as above these rates are set via arbitrage with the Fed's target; as longer maturities are issued, again as above these rates are set largely via arbitrage with the expected path of the Fed's target. The "crowding out" view of the loanable funds market is irrelevant; the rates on various types of Treasury debt are set by the current and expected paths of monetary policy and according to liquidity premia on fixed-rate debt of increasing maturity. Since long-term rates are normally higher than short-term rates, total interest on the national debt would be significantly reduced if IBRBs eventually replaced Treasuries. Those—like the Treasury—fearful that IBRBs would reduce seigniorage income neglect that this would be far outweighed by the reduction in total interest paid on a national debt increasingly held as IBRBs. Indeed, there is no inherent reason for Treasury liabilities to exist across the entire term structure except as support operations for longer-term rates (Mitchell and Mosler 2002).

Deficits unaccompanied by bond sales are disapprovingly labeled "monetization," although there is no meaningful difference from when bonds *are* issued. A government deficit *always* creates net financial assets for the private sector (Mosler 1997-8; Mosler and Forstater 1999); that is, when a deficit occurs, by definition the total credits to recipient bank accounts due to government expenditures are greater than the total debits from bank accounts to pay taxes. Whether bonds are issued to drain excess balances has *no* effect upon the private sector's net financial assets: the bond purchaser replaces a bank liability with the bond, while her bank's liabilities and reserve balances are both debited; if the bond is sold directly to a bank, then the bond simply replaces reserve balances (see Bell and Wray 2002-3 or Wray 2003-4 for further discussion). (Even where the Fed is prohibited legally from lending directly to the Treasury, bond sales themselves create net financial assets *when* the bonds are credited since no bank assets/liabilities are debited until deficit spending simultaneously re-credits them.) Whether bonds are sold, the ability of banks to finance further private spending is unaffected by debiting

reserve balances or deposits created through deficit spending; recall that since loans create deposits, if there are willing, creditworthy borrowers then desired spending is financed in any event. For deficits, what matters for the determination of aggregate spending and inflation is *not* whether bonds are sold but whether the deficit is too large given the private sector's desire to net save.

To summarize, consideration of interest payment on reserve balances demonstrates that bond sales are offsetting, interest-rate maintenance operations, not financing operations. With IBRBs eventually the entire national debt could be held exclusively as reserve balances. As Abba Lerner (1943) envisioned, Treasury bond sales would occur simply because the private sector desired Treasuries for use as collateral or as risk-free, fixed-rate investments. With NIBRBs all reserve balances except those necessary to settle payments are drained via security sales by either the Fed or the Treasury. Reserve requirements necessitate that some additional reserve balances be left in circulation. Thus, when a deficit is incurred, the quantity of bonds sold depends upon the method of interest-rate maintenance. As the impacts upon the net financial assets of the private sector from replacing credited NIBRBs with an interest bearing bond or simply crediting IBRBs at the outset are identical, it is arbitrary to refer to the former as "financing" and to the latter as "monetization." While government spending might be limited as a result of self-imposed legislation or lack of public support, the federal government is not *financially* constrained even where the Treasury issues bonds.

Concluding Remarks

This paper has discussed how interest payment on reserve balances could both simplify monetary policy operations of the Fed and free the Treasury and the Fed from selling bonds to support the Fed's interest rate target. The more significant point is that consideration of interest payment on reserve balances demonstrates the accommodative nature of the Fed's operations and the offsetting (rather than "financing") nature of the Treasury's security operations.

Notes

1. Presented at the annual meetings of the Association for Evolutionary Economics, January 2005, Philadelphia, PA. Special thanks to Warren Mosler for comments on an earlier version of this paper. Any remaining errors are mine.
2. Even more to the point, reserve balances are transferred from one member bank to another via simultaneous debit/credit by the Fed. Reserve balances never "go" anywhere else.
3. The New York Fed reported that in 2003, "As measured by both the standard deviation and the daily trading range, average intraday volatility decreased, falling from 2002's already low levels" (2004, 23). It added that "the daily fed funds high rate deviation exceeded 100 basis points on only one occasion in 2003, compared with seven and fifteen occasions in 2002 and 2001, respectively" (24).
4. While a change in the federal funds rate might alter deposits, and therefore reserve requirements and the demand for reserve balances, this change occurs with a lag. Regardless, any change to reserve balances would be the *result* of the change in the federal funds target which might then affect deposits and reserve requirements; this is distinct from a liquidity effect where a change in reserve balances is necessary to move the federal funds rate to a new target. (Recall that banks cannot "use" reserve balances for anything other than settling

payments or meeting reserve requirements; they do not “fund” additional lending.) The case of Japan (where interest rates were near zero while demand deposits creation stagnated) demonstrates that such effects on deposits from low interest rates are far from certain at any rate.

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