Monetary Policy as a Carry Trade

Marvin Goodfriend
Carnegie Mellon University

Shadow Open Market Committee Meeting

New York, New York
November 3, 2014

MONETARY POLICY AS A CARRY TRADE

Marvin Goodfriend[1]

Revised October 2014

ABSTRACT: Quantitative monetary policy at the zero interest bound should be understood as a "bond market carry trade." Net interest earnings on the front end of the monetary carry trade should be retained—to guard against the central bank having to create reserves (or borrow) to pay interest on reserves or managed liabilities on the back end, and to show that interest expenses are paid for in large part by earnings from the front end. In the United States, the Federal Reserve balance sheet reflects the front end of a carry trade in that by the end of 2014, about $3 trillion of reserves paying 0.25% will finance (carry) a like quantity of security holdings averaging 10 years or more in maturity earning 2.5%. The Fed has long asserted independent authority to retain net interest income thought necessary as surplus capital against prospective exposures on its balance sheet. The Fed recognizes that the retention of net interest earnings to build up surplus capital incurs no resource cost for the Treasury or taxpayers. Yet, the Fed has chosen not to build up surplus capital against the carry trade exposure and risk on its balance sheet, jeopardizing the operational credibility of monetary policy for price stability.

[1]Friends of Allan Meltzer Professor of Economics, Tepper School of Business, Carnegie Mellon University. The author would like to thank Al Broaddus, Huberto Ennis, Hiroshi Fujiki, Ichiro Fukunaga, Robert Hetzel, Todd Keister, Elizabeth Klee, Pierre Liang, Allan Meltzer, Charles Plosser, Chester Spatt, and Charles Steindel for discussions and correspondence that greatly improved the paper. The paper benefitted from an initial presentation at the May 2014 BOJ-IMES Conference "Monetary Policy in a Post-Financial Crisis Era" at the Bank of Japan, and from subsequent presentations at the Federal Reserve Bank of Richmond, the 2014 International Business Cycle Conference of the Kiel Institute for the World Economy in Berlin, and the 2014 Swiss National Bank (SNB) Research Conference "Exit Strategies." Formal discussions of the paper at the SNB conference by David Archer and Thomas Moser were especially appreciated. Research for the paper was undertaken initially for a presentation, "The 1951 Fed-Treasury Accord: Its Historic Significance and Relevance for Current Policy," at the 10th Philadelphia Fed Policy Forum in December 2013. The paper is forthcoming in *Monetary and Economic Studies*, Bank of Japan, November 2014.

1) INTRODUCTION

Ordinarily, an interest rate policy benchmark such as the Taylor Rule works well to steer monetary policy. A policy rule acts against the inflationary temptation to slide into discretionary stimulus (whose benefits come early and costs later) and to guide monetary stimulus when needed to counteract deflation. Often overlooked or taken for granted is that an interest rate rule works well because it is "operationally credible," meaning: i) the central banker has the operational power(s) to manage short-term interest rates according to the rule, ii) the central banker is demonstrably willing to employ interest rate policy according to the benchmark rule, on occasion more aggressively if need be to enforce its credibility, and iii) the public and the monetary policy oversight committees in the legislature accept (i) and (ii).

The credible interest rate rule for monetary policy geared to low inflation was a long time coming. For instance, in the United States the Fed won independence for its interest rate instrument from the Treasury in the 1951 Accord; later, the Fed learned from the Great Inflation that rising inflation produced rising unemployment; the 1980s Volcker Fed showed that aggressive interest rate policy could bring inflation down at considerable, but temporary, cost in unemployment: the 1990s Greenspan Fed demonstrated that well-timed interest rate policy actions could sustain price stability without recession; and the public came to regard interest rate policy actions as acceptable and necessary to sustain low inflation and the lowest unemployment that monetary policy alone could deliver.

By the end of 2014, it will be six years that interest rate policy in the United States has been immobilized at the zero bound. Only one of the abovementioned understandings that produced operationally credible monetary policy from the earlier period carried over intact at the zero bound--the case for price stability. The Federal Open Market Committee reinforced that understanding by formally adopting a 2% inflation objective in January 2012. The remaining operational understandings regarding monetary policy no longer applied.

Section 2 explains that quantitative monetary policy credibility against deflation at the zero interest bound necessitates a willingness to create bank reserves via the acquisition of long-term securities on an unprecedented scale far beyond limits ordinarily thought prudent. Section 3 explains that interest on reserves secures credibility for aggressive enlargement of the balance sheet against deflation by enabling the central bank to raise interest rates against inflation, if need be, flexibly and precisely without first shrinking its balance sheet.

Section 4 observes that quantitative monetary policy at the zero bound should be understood as a "bond market carry trade," involving as it does the acquisition of higher-interest long-term bonds with funds acquired by issuance of lower-interest short-term liabilities. In the United States, the Federal Reserve balance sheet reflects a carry trade in that by the end of 2014, about $3 trillion of reserves paying 0.25% will finance (carry) a like quantity of security holdings averaging 10 years or more in maturity earning an average 2.5%. When interest rate policy exits the zero bound, the Fed will have to pay interest on reserves in line with market interest rates to carry $3 trillion of securities on its balance sheet.

The "bond market carry trade" framework is useful because it identifies financial and fiscal issues that an independent central bank should address to attain operational credibility for quantitative monetary policy at the zero bound. In particular, the central bank should retain net interest income earned on the front end of its carry trade (when interest paid on reserves is at or near zero) against expected interest costs and risk on the back end of its carry trade (when interest paid on reserves must follow market interest rates higher). Retained earnings guard against the central bank having to create reserves (or borrow) to pay interest on reserves on the back end its carry trade. And retained earnings mitigate criticism of the cost of interest on reserves by making clear that interest on reserves is paid for in large part by earnings from the front end of the carry trade.[2]

Section 5 documents that the Federal Reserve has long asserted independent authority to retain net interest earnings thought necessary as surplus capital against prospective exposures and risk on its balance sheet. Moreover, the Fed recognizes that withholding net interest earnings to build up surplus capital incurs no resource cost for the Treasury or taxpayers. Yet the Fed has chosen not to build surplus capital above its modest longstanding level while remitting around $80 billion per year to the Treasury since 2010 on the front end of its monetary carry trade. The Fed should suspend transfers to the Treasury and build up surplus capital against the enormous, unprecedented carry trade exposure and risk on its balance sheet.

Section 6 acknowledges that the retention of net interest earnings by the Fed to build up surplus capital creates a problem for the Treasury under the federal debt ceiling. However, legislation signed into law in February 2014 suspended the debt ceiling

[2] Archer and Moser-Boehm (2013), Carpenter et al. (2013), Christensen, Lopez, and Rudebusch (2014), Del Negro and Sims (2014), Hall and Reis (2013), and IMF (2013) assess empirically and theoretically questions of central bank insolvency.

through March 2015. The Fed could stop transferring net interest income to the Treasury while the debt ceiling is suspended, and work with the fiscal authorities to facilitate the buildup of its surplus capital thereafter, perhaps by obtaining an exemption for its holdings of Treasuries from the debt ceiling, at least until the Fed can normalize its balance sheet.

2) MONETARY POLICY AT THE ZERO INTEREST BOUND

A central bank drives short-term nominal interest rates to zero by satiating banks with reserves. Transactions services provided by bank reserves, deposits, and currency are then no longer scarce, and the narrow liquidity channel of monetary policy transmission is exhausted. At that point, ordinary interest rate policy is severely attenuated, and "forward guidance" must be relied upon to deliver additional interest rate policy stimulus.

Broad liquidity is not satiated at the zero interest bound, however, and provides the means for quantitative monetary policy to deliver additional monetary stimulus.[3] Broad liquidity services are provided by assets according to how easily they can be turned into cash if need be, either by their sale or by serving as collateral for external financing. Bank reserves, transactions deposits, and currency provide broad liquidity services at the zero interest bound; and time deposits, money market instruments, and Treasury bills are the most broadly liquid non-monetary assets.

Expansive monetary policy at the zero interest bound works much like ordinary monetary policy—through a portfolio rebalancing channel and a credit channel much intertwined. The common total, risk-adjusted expected return on any security or asset is composed of a pecuniary return plus an implicit broad liquidity service yield. The more liquid an asset, the higher is its implicit liquidity service yield and the lower is its pecuniary yield. An injection of broadly liquid assets by the central bank drives down implicit broad liquidity service yields on all assets and gives households and firms an incentive to trade broadly liquid assets for less liquid assets with a higher pecuniary rate of return. Portfolio rebalancing drives the pecuniary yield on less liquid assets down and their prices up.

Lower long-term interest rates and higher asset prices raise desired consumption relative to current income. And higher asset prices relative to their cost of production stimulate investment. Strengthened consumption and investment stimulate employment. Higher utilization rates and profits raise asset prices further.

[3] This section draws from Goodfriend (2000).

Because asset prices are higher, collateral values are higher, net worth is higher, and bank capital is higher. Higher net worth and collateral valuations to back loans bring down the external finance premium. Credit spreads narrow. Bank lending and spending are stimulated as the cost of borrowing against future income prospects falls. The credit-channel stimulus occurs alongside the portfolio rebalancing channel.

The central bank's primary policy problem upon hitting the zero interest bound is to establish from scratch and on short notice operational credibility for quantitative monetary policy against deflation. To do so, the central bank must be prepared (and convince markets that it is prepared) to increase the stock of broadly liquid assets immediately and aggressively as needed to act against deflation. In addition, the central bank must extend the maturity of its open market purchases from short-term securities to less liquid long-term securities so that each dollar of bank reserves created to buy securities delivers a large net increase in broadly liquid assets.[4] And the central bank must recognize that to exert significant monetary stimulus via broad liquidity, quantitative monetary policy must act on a very large scale given the large stock of broadly liquid assets in the economy.

In the United States, the stock of broadly liquid assets was around $15 trillion in 2008.[5] The logic above suggests that the Federal Reserve's extraordinarily aggressive quantitative monetary policy was called for in the wake of the Great Recession. The Fed's aggressive monetary stimulus likely played a critically important, if not the decisive role in averting deflation that might have occurred otherwise.

3) THE ROLE OF INTEREST ON RESERVES

The Fed began to pay interest on reserves in October 2008 after asking Congress to expedite authorization granted in the Financial Services Regulatory Relief Act of 2006.[6] Interest on reserves would create a floor below which banks would not lend to each other in the federal funds market.[7] As initially envisioned, interest on reserves would enable the Fed to create bank reserves on a massive scale to re-intermediate distressed

[4] A given net broad liquidity stimulus delivered via the acquisition of short-term securities alone would require much more reserve creation, which would take time and involve potential complications regarding the immobilization of reserves discussed in Section 4.3.
[5] Goodfriend (2011a), page 120.
[6] Authority for the Fed to pay interest on reserves was initially legislated to begin in 2011.
[7] The federal funds rate has fallen below interest on reserves because some large non-depository lenders in the federal funds market are ineligible to earn interest on their balances at the Fed. See Goodfriend (2011b), pp. 7,8, and 11 and Federal Reserve Bank of New York (2014) , pp. 20-21.

banking and money market borrowers without lowering the federal funds rate target.[8] As it happened, the Fed cut interest on reserves to ¼% in December 2008 to fight the Great Recession, and interest rate policy has been immobilized at zero since then. Nevertheless, expedited authority to pay interest on reserves was then crucial for establishing operational credibility for monetary policy against both inflation and deflation. [9]

To build operational credibility quickly against deflation, the Fed had to demonstrate a willingness to follow its initial open market purchases of long-term securities with trillions more, if need be. In other words, the Fed had to show itself (and the public had to believe the Fed to be) undeterred from overshooting its balance sheet expansion against deflation for fear of triggering inflation. The October 2008 emergency acquisition of the power to pay interest on reserves enabled the Fed to do just that, because interest on reserves gave the Fed the operational capability to reverse field and raise market interest rates quickly and aggressively against inflation without first shrinking its balance sheet. Without authorization to pay interest on reserves, the Fed would have had to sell securities to drain nearly all the reserves created against deflation in order to lift the federal funds rate much above zero, which would have been difficult, if not impossible to do in a timely and orderly manner.[10]

4) MONETARY POLICY AS A CARRY TRADE

Operationally credible monetary policy at the zero bound should be understood as a "bond market carry trade," involving as it does the acquisition of higher-interest long-term bonds with funds acquired by issuance of lower-interest short-term (bank reserve) liabilities. The Federal Reserve balance sheet reflects a carry trade in that by the end of 2014 about $3 trillion of reserves paying 0.25% will finance (carry) a like quantity of security holdings averaging 10 years or more in maturity earning an average 2.5%.[11] When interest rate policy exits the zero bound, the Fed will have to pay interest on reserves in line with market interest rates to carry $3 trillion of securities on its balance sheet.

---

[8] Goodfriend (2002).

[9] Chairman Bernanke in his written testimony for the July 2009 *Monetary Policy Report to Congress* (page 3) emphasized that the authority to pay interest on reserves would be the most important tool enabling the Fed to raise interest rates without shrinking its balance sheet.

[10] The utilization of reserve requirements alone to absorb reserves on such a large scale would have been problematic. See Section 4.3.

[11] See Board of Governors of the Federal Reserve System (2008, 2014).

The Fed created $1 trillion of reserves to re-intermediate short-term credit markets in the fall and winter of 2008-09 and will have created about $2 trillion more in three waves of quantitative easing (QE) by the end of 2014.[12] In all, Fed assets will have expanded to around $4.5 trillion, from $1 trillion in September 2008 when Fed assets were financed almost entirely by currency and only about $25 billion of bank reserves.[13] During this period, the Fed also more than doubled the average maturity of its portfolio of securities. From December 2007 to December 2012 the average maturity of Treasury securities in the Fed portfolio increased from around 5 years to over 10 years.[14] And to April 2014 the Fed acquired $1.6 trillion of mortgage backed securities with average maturity over 10 years.[15]

The "bond market carry trade" framework is useful because it identifies financial and fiscal issues that an independent central bank should address to secure operational credibility for quantitative monetary policy against inflation and deflation at the zero interest bound and in the exit from the zero bound. Section 4 addresses four aspects of the monetary carry trade in turn: i) why run a carry trade, ii) cash flows, risk, and expected returns, iii) immobilization of bank reserves, and iv) the negative cash flow problem.

4.1) Why Run a Carry Trade?

The central bank could unwind its carry trade before short-term interest rates are expected to exit the zero bound. Open market sales then could drain reserves without realizing capital losses on sales of long-term securities. Preemptive shrinking of the central bank balance sheet, however, has operational problems. Selling trillions of long-term securities takes time, and might inadvertently signal a premature elevation of future short-term interest rates and induce an unwelcome elevation of long-term rates. A "catch-22" problem would deter the central bank from attempting to unwind its carry trade well before interest rates need to rise. At that point, however, the central bank could not avoid capital losses on the sale of its long bonds.

Such considerations suggest that the best that can be hoped for is to unwind the central bank balance sheet over time according to a gradual pre-announced timetable or rule.[16]

---

[12] The first rounds of QE known as QE1 began in November 2008 and March 2009, QE2 began in November 2010, and QE3 began in September 2012.
[13] Currency outstanding grew by around $500 billion during this period. See footnote 34.
[14] Greenlaw at al. (2013), page 70.
[15] Federal Reserve Bank of New York (2014), pp. 4-7.
[16] The rule could allow long bonds to run off at maturity and manage the shrinkage of the balance sheet more precisely via operations in shorter-term securities.

The rule for normalizing the central bank's balance sheet could be announced after interest rate policy has exited the zero bound. The presumption should be that the central bank must be prepared to raise market interest rates against inflation, if need be, by raising interest paid on reserves well before unwinding its carry trade.[17] It is worth noting that the quantitative monetary stimulus remaining in place on the back end of the carry trade potentially necessitates higher short-term interest rates than otherwise to deliver a given degree of monetary restraint against inflation.

4.2) Cash Flows, Risk, and Expected Returns

A central bank that runs a monetary carry trade can expect unconditionally the following sequence of returns. Initially, the central bank earns the favorable spread between long-term securities on its balance sheet and near-zero interest on reserves. When the time is judged to be appropriate, the central bank revives interest rate policy by paying higher interest on bank reserves to support higher short-term money market interest rates. As the central bank carries the long bonds on its balance sheet, unconditionally it can expect to give back (as interest on reserves) all net interest earnings accumulated previously on the carry trade up to those reflecting the return to risk-bearing and forgone liquidity associated with the term premium on long bonds.[18] If the central bank acquired its long bonds at prices which discounted future short-term interest rates accurately, and if the central bank plans to hold the bonds to maturity or nearly so, then if its carry trade has little effect on market prices and returns, the unconditional expected return on the monetary carry trade would just be the market-determined term premium.[19]

Monetary carry trade risk arises primarily from possible errors forecasting future short-term interest rates.[20] For instance, the carry trade would take unexpected losses if future short rates rise sooner than expected, or if short rates rise higher than expected perhaps to fight an inflation scare, or if short rates settle higher than expected. Losses could be especially large if the central bank allows rising inflation to take expected inflation and the inflation premium in nominal interest rates higher as well.

---

[17] International Monetary Fund (2013), page 27.

[18] Gurkaynak and Wright (2012) discuss the macro-econometrics of the term premium. On page 349, they report estimates of the 10-year term premium in the United States from 1971 to 2009 from Christensen, Diebold, and Rudebusch (2007). The estimated term premium is as high as 5% in the early 1980s and falls gradually to range between 2% and 0% since 2000.

[19] Empirical evidence indicates that the expectations hypothesis of the term structure of interest rates works reasonably well unconditionally at long horizons. Cochrane (1999), pp. 46-8.

[20] Risk also arises from errors forecasting the term premium. The analysis in the paper presumes implicitly that the central bank purchases default-free securities only.

Quantitative monetary policy undertaken aggressively to act against deflation would tend to reduce expected returns on the monetary carry trade for two reasons. Quantitative policy potentially depresses the term premium on long bonds acquired by the central bank. And quantitative stimulus remaining on the central bank's balance sheet potentially necessitates higher short-term interest rates against inflation than otherwise.

4.3) Immobilization of Bank Reserves

When the time comes to exit the zero interest bound, the large volume of bank reserves created by the central bank would continue to press the rate at which banks lend to each other down to the interest-on-reserves floor. In so doing, the large volume of bank reserves would continue to be immobilized as it was at the zero interest bound because the zero opportunity cost of holding bank reserves would be perpetuated even as the central bank raises interest rates.

Recent experience has shown that depositories are willing to hold large quantities of reserves at zero opportunity cost. For instance, as of April 2014 commercial banks in the United States held around 25% reserves against deposits.[21] Nevertheless, a central bank running a monetary carry trade should prepare other means of immobilizing bank reserves in case aggregate reserves come to exceed the volume that depositories are willing to hold. Excess reserves could become highly inflationary in that case, necessitating sharply higher short-term interest rates and the potentially disruptive, rapid draining of reserves via the sale of securities from the central bank portfolio. A central bank can immobilize reserves in two additional ways: by borrowing reserves via managed liabilities and by imposing reserve requirements on depository institutions.

Managed liabilities could be issued flexibly and in quantity to help absorb and immobilize bank reserves on short notice, if need be. For instance, the Fed has begun to offer term deposits and reverse repurchase agreements to borrow reserves from both depositories and a wide variety of money market counterparties.[22] Interest that the Fed pays on term deposits and reverse repurchase agreements should be expected to differ relatively little from interest on reserves.[23] So managed liabilities would not change much the interest cost of the Fed's monetary carry trade. Fed managed liabilities would

[21] McCauley and McGuire (2014).
[22] See Federal Reserve Bank of New York (2014), pp. 22-3. Reverse repurchase agreements extinguish reserves by selling securities temporarily from the Fed portfolio. Term deposits shift the type of depository balance at the Fed from reserve balances to time deposits.
[23] Potter (2013).

be subject to rollover risk in times of financial turmoil if cash came to be more highly valued than safe short-term loans to the Fed. So the Fed should use managed liabilities relatively sparingly to immobilize reserves. Mainly, managed liabilities will be useful for fine-tuning money market interest rate spreads relative to interest paid on bank reserves in the implementation of interest rate policy.[24]

Reserve requirements could be utilized to help absorb and immobilize bank reserves. However, reserve requirements would be costly to enforce and administer on a large scale, especially if little or no interest were paid on required reserves. The reserve requirement tax would hurt bank profits, raise the cost of depository financial intermediation, and encourage tax avoidance behavior by depositories of the sort that has been a problem in the past. So if reserve requirements were employed extensively to immobilize reserves, required reserves would have to pay interest near the interbank interest rate, in which case reserve requirements would save little on the interest cost of the monetary carry trade.

4.4) The Negative Cash Flow Problem

It is not difficult to imagine circumstances in which a deeply negative net interest margin on the back end of a monetary carry trade could produce a negative cash flow problem for a central bank. For instance, a central bank acting against persistent deflation could acquire trillions of dollars of long bonds at very low interest which proves insufficient to cover interest-on-reserves expenses on the back end of the carry trade. On the other hand, a central bank (carrying trillions of dollars of long bonds with a like quantity of reserves) that is too slow to exit the zero bound might unhinge inflation expectations and incur interest-on-reserves expenses to fight inflation in excess of interest earnings on its holdings of long bonds. And the above circumstances could arise easily in tandem—if a protracted expansion of the central bank balance sheet against deflation overshoots and inadvertently triggers an inflation scare.

The power to create money in the form of bank reserves uniquely positions a central bank to address a negative cash flow problem. As a mechanical matter, a central bank can create reserves to pay interest on reserves and managed liabilities. However, a central bank committed to a low inflation objective must be sensitive to the effect that creating reserve-money to stabilize the value of money might have on its credibility for low inflation. A period in which the central bank is seen as having to create reserves (to pay interest on its liabilities) to stabilize the purchasing power of money will rightly unnerve and very possibly unhinge inflation expectations, especially if the period is at

[24] See footnote 7.

all protracted. Moreover, the creation of reserves to supplement negative cash flow puts more interest-bearing reserves on the balance sheet without the acquisition of interest-earning assets, worsening the cash flow problem. A central bank should position itself to steer clear of ever having to create reserves to stabilize the purchasing power of money.

Borrowing to pay interest on central bank liabilities via reverse repurchase agreements or term deposits, for example, is also problematic. Borrowing avoids potential immobilization complications and perhaps some negative credibility consequences of reserve creation. But borrowing to pay interest likewise expands interest-bearing liabilities on the central bank balance sheet without acquiring interest-earning assets.[25]

Negative cash flow is best addressed with retained earnings held in the central bank's surplus capital account. Sales of short-term securities held as surplus capital to help pay interest on central bank liabilities would realize little if any capital loss and would not disturb monetary policy operations. Retaining earnings on the front end of the monetary carry trade as surplus capital would facilitate greatly the operational credibility of monetary policy against inflation by i) guarding against the central bank having to create reserves (or borrow) to pay its interest expenses and ii) mitigating criticism of its interest expenses by making clear that interest on reserves and managed liabilities is paid for largely, if not in full, by net interest earnings from the front end of the monetary carry trade together with interest earned on the back end.

5) FED SURPLUS CAPITAL AND THE MONETARY CARRY TRADE

The Fed has long claimed independent authority over the size of its surplus capital account and the transfers it withholds from the Treasury to maintain its surplus capital. Furthermore, the Fed recognizes that the retention of transfers incurs no resource cost for the Treasury or taxpayers. Yet the Fed has chosen not to build surplus capital above its modest longstanding level while remitting around $80 billion per year to the Treasury since 2010 on the front end of its monetary carry trade, even though Fed assets will have risen from $1 trillion in September 2008 to around $4.5 trillion by the end of 2014, and $3 trillion of securities with an average maturity of over 10 years will then be financed with market interest on reserves and short-term managed liabilities. This section reconsiders the management of Fed surplus capital from the carry trade perspective, and recommends that the Fed suspend transfers to the Treasury and build up surplus capital to help secure operational credibility for its 2% inflation objective.

[25] Central bank borrowing to finance interest on its liabilities has no net effect on aggregate bank reserves.

5.1) A Brief History of Fed Surplus Capital[26]

The Federal Reserve Act of 1913 requires that each member bank subscribe to the capital stock of the Fed an amount equal to 6% of the capital and surplus of the member bank. As member bank capital and surplus changes, the holding of stock is to be adjusted. Only one-half of subscribed capital has ever been paid-in.

Initially, the Federal Reserve Act authorized the Fed to build up a surplus by retaining interest earned from its asset portfolio until surplus reached 40% of paid-in capital of member banks. After surplus reached 40%, net earnings were to be transferred to the Treasury as a "franchise tax." In 1919 the Federal Reserve Act was amended to allow surplus to be raised to 100% of subscribed capital (twice paid-in capital.) The Banking Act of 1933 transferred half of Fed surplus, $139 million, to capitalize the newly established Federal Deposit Insurance Corporation. In return, Congress abolished the franchise tax and allowed the Fed to retain all subsequent net earnings to rebuild surplus.

The present basis for Fed-Treasury transfers was set in 1947 as part of what would become the 1951 Fed-Treasury Accord freeing the Fed from its World War II interest rate pegging policy. As part of the Accord, the Federal Reserve Board voluntarily resumed Fed-Treasury transfers as "interest on Federal Reserve notes," transferring 90% of net earnings to the Treasury as part of the agreement to float the Treasury bill rate. Fed surplus capital continued to accumulate until 1959, when the Fed appealed to the principle that Congress had established in 1919. The Fed then voluntarily announced its decision to maintain surplus at 100% of subscribed capital, to immediately transfer to the Treasury all surplus currently in excess of that amount, and to transfer to the Treasury 100% of net earnings after maintaining surplus at the level of subscribed capital thereafter.

Growth of member bank assets and liabilities yielded a 35% increase in subscribed Fed capital from 1959 to 1964 at a time of federal budget deficits. And in 1964 the Fed announced voluntarily an immediate 50% reduction in surplus to the level of paid-in capital that added $524 million dollars to the amount transferred to the Treasury in 1965. With minor exceptions, the Fed has transferred to the Treasury 100% of net earnings after maintaining surplus at paid-in capital to this day.[27]

---

[26] This history of Fed surplus capital draws on Goodfriend and Hargraves (1983), pp.11-14.

[27] The 1993 Deficit Reduction Act contained a provision to transfer $213 million from the Fed surplus account to help meet federal budget targets in fiscal years 1997-98 but the Fed was free

5.2) Fed Independence, Surplus Capital, and Fed-Treasury Transfers

Bringing matters up to date, the Federal Reserve Board asserts in the 2012 *Annual Report* its independent authority over the size of the Fed surplus capital account and the transfer of excess earnings to the Treasury.[28] The United States General Accounting Office (GAO) has concurred. GAO (1996) states

> …Currently, and in the past, the levels of the surplus account have been discretionary because the requirement to have the surplus account equal to paid-in capital has been a matter of Federal Reserve policy; it was not required by law…Congress may wish to determine whether these surplus accounts are necessary and, if so, set permanently in law an appropriate amount for these accounts.[29]

Despite the GAO (1996) report's suggestion, Congress has declined to set in law requirements for Fed surplus and transfers, and continues to allow the Fed latitude to determine independently its policy toward surplus and transfers to the Treasury. GAO (2002) repeats

> The amount and timing of the Reserve Banks' payments to the Treasury are not regulated by law. The Federal Reserve Board has discretion over the amounts the Federal Reserve System transfers to the Treasury.[30]

GAO (2002) reports the Fed's rationale for retaining surplus capital

> The *Financial Accounting Manual for the Federal Reserve Banks* says that the primary purpose of the surplus account is to provide capital to supplement paid-in capital for use in the event of loss. According to Board officials, the capital surplus reduces the probability that total Reserve Bank capital would be wiped out by a loss as a result of dollar appreciation, sales of Treasury securities below par value, losses associated with discount window lending…[31]

Finally and importantly, the Fed comment letter on GAO (2002) emphasizes that

---

to restore surplus to paid-in capital shortly after fiscal 1998 by withholding of transfers to the Treasury. The 2000 Consolidated Appropriations Act directed the Fed to transfer $3.752 billion during fiscal 2000. Again the Fed was permitted to retain earnings thereafter and shortly restored surplus to paid-in capital by withholding transfers to the Treasury.

[28] Board of Governors of the Federal Reserve System (2012), page 260.

[29] Government Accounting Office (1996), pp. 67-68.

[30] Government Accounting Office (2002), page 1.

[31] Ibid., page 7.

> …while the benefits of the surplus account can be debated, it is costless to the taxpayer and the Treasury…[32]

And GAO (2002) reports that the Congressional Budget Office agrees that

> …the transfer of surplus funds from the Federal Reserve to the Treasury has no import for the fiscal status of the Federal government…Where the funds reside has no economic significance. Hence, any transfer of the Federal Reserve surplus fund to the Treasury would have no effect on national savings, economic growth, or income. [emphasis in original][33]

Thus, there is general agreement that the retention of net interest earnings by the Fed to build up surplus capital has no resource cost for the Treasury or taxpayers. Briefly, the reasoning is this. If the Fed sells a security and transfers the proceeds of the sale to the Treasury, the Treasury loses the interest on that security, interest it would have received from the Fed. It is as if the Treasury issued a new security to borrow the funds in the first place. Hence, the reduction of Fed surplus yields no new revenue for the government. Conversely, retaining earnings that would have been transferred deprives the Treasury of no revenue because the acquisition of a security for the Fed's capital account and the transfer of that new interest is as if the Treasury retires an outstanding security that it had borrowed against previously.

5.3) Why the Fed Should Retain Its Monetary Carry Trade Earnings

By the end of 2014 around 1/3 of the Fed's $4.5 trillion of securities with an average maturity of around 10 years will be financed with around $1.5 trillion of non-interest bearing currency.[34] Taking currency into account and the roughly 2.5% average coupon interest per annum on Fed assets, Fed interest earnings alone could then finance at most 3.75% interest per annum on the Fed's $3 trillion of reserve balances and money market liabilities. The Federal Open Market Committee projects a longer run federal funds rate target slightly below 4% which, roughly speaking, the Fed would have to pay on

[32] Ibid., page 24.
[33] Ibid., page 17.
[34] The demand for currency tends to grow with GDP over time. For instance, the stock of currency will have grown from around $1 trillion at the end of 2008 to around $1.5 trillion by the end of 2014. The growing demand for currency is financed by a drawing down of bank reserves, helping to reduce the interest expense of the Fed's monetary carry trade gradually over time. See Federal Reserve Bank of New York (2014), pp. 10-11.

reserves and managed liabilities to finance its carry trade.[35] Plausibly, interest paid by the Fed might have to go even higher as the economy gathers strength, especially if the Fed allows inflation expectations to drift upward and must push short-term interest rates much higher against an inflation scare. So currency does not provide as much of a financial cushion for the Fed as one would like.

With a balance sheet such as that described above, the Fed would halt remittances to the Treasury if interest rate policy considerations call for interest on reserves and monetary liabilities to rise above 3.75%.[36] The Fed could then draw down its modest surplus capital to finance interest payments above 3.75%. After exhausting surplus capital, the Fed would be forced to create reserves or to borrow via managed money market liabilities to finance interest payments above 3.75%. In so doing, the Fed would grow its interest-bearing liabilities without acquiring new assets, exacerbating the negative cash flow problem. As emphasized in Section 4.4, the credibility of the Fed's 2% inflation objective would be jeopardized if the Fed were ever forced to create bank reserves or to borrow to pay interest on its liabilities.[37]

Fed remittances to the Treasury averaged around $80 billion per year from 2010 through 2013 as the Fed expanded its balance sheet to $4 trillion and earned the

[35] Federal Open Market Committee (2014), page 3, reports the average projection of the federal funds rate target deemed appropriate at the end of 2015 and 2016, respectively, as 1% (with a 0% to 3% range) and 2.5% (with a 3/4% to 4.25% range), and over the longer run as slightly below 4% (with a range from 3.5% to 4.25%).

[36] As a mechanical matter, in practice the Fed would halt remittances to the Treasury if interest income from its portfolio were ever insufficient to maintain surplus equal to paid-in capital after i) paying the 6% dividend on member bank paid-in capital, ii) paying interest on reserve balances and money market liabilities necessary for monetary policy, iii) funding other net operating expenses, and iv) retaining earnings to cover realized losses on sales of domestic securities or revaluation losses on foreign securities, if any. At that point the Fed could choose to create reserves, borrow via managed liabilities, or draw down its surplus capital to address its negative cash flow problem. As an accounting matter, the Fed plans to record reserves and managed liabilities created to offset negative cash flow in a "negative liability account to the Treasury." If the negative liability account were ever to exceed the size of surplus and paid-in capital, the Fed would be technically insolvent. The negative liability account would reflect an implicit interest-free loan to the Treasury with an implicit promise that the Fed could retain future net interest income (seigniorage) to extinguish the implicit loan to the Treasury before restarting any remittances to the Treasury. See Eisenbeis (2011) and Fry (1993).

[37] This concern is expressed by Swiss National Bank Governor Thomas Jordan, Jordan (2011), pp. 10-11 and by former Bank of England Governor Mervyn King, King (2012), page 6.

favorable 2% net interest margin on the front end of its carry trade.[38] Had the Fed understood its quantitative monetary policy at the zero bound as a carry trade, it would have had good reason to withhold that $320 billion of net interest earnings to guard against ever having to create reserves or borrow to meet its interest expenses, and to make the public understand that interest on reserves and managed liabilities the Fed must pay eventually to sustain 2% inflation is paid for in large part, if not in full, by net interest earned on the front end of its carry trade together with interest earned on the back end.[39]

Instead, the Fed has continued its long-standing practice of transferring to the Treasury 100% of net earnings after maintaining surplus at paid-in capital, a level geared to the historically low exposures and risks on the Fed balance sheet.[40] As of April 2014, surplus capital was only about $25 billion, 0.66% of the Fed's $4 trillion balance sheet, down from about 2% in September 2008 in spite of the Fed's acquisition of enormous monetary carry trade exposure and risk.[41]

It is not too late for the Fed to build up surplus capital in support of its monetary carry trade. With short-term interest rates near zero, the front end of the Fed's monetary carry

[38] Federal Reserve Bank of New York (2014), page 7. Fed-Treasury transfers averaged around $30 billion per year from 2002 to 2008 and rose to $40 billion in 2009 after the Fed began to expand its balance sheet during the 2008 credit turmoil and the Great Recession.

[39] International Monetary Fund (2013), pp. 27-8 projected as of April 2013 that the Fed would eventually lose between 2% and 4.3% of US GDP as it normalized interest rate policy in coming years for a scenario similar to the November 1993 to February 1995 Fed tightening. Interestingly and very roughly, presuming that the Fed would exit the zero interest bound at the end of 2015, it would by then have transferred around $500 billion to the Treasury on the front end of its monetary carry trade, which is roughly around 3% of 2014 US GDP.

[40] By way of comparison, the Bank of Japan is authorized by law to retain 5% of net income each fiscal year for its surplus account. In May 2014, while implementing its own monetary policy carry trade at the zero interest bound to bring an end to deflation and achieve its 2% inflation objective, the Bank of Japan with the authorization of the Minister of Finance moved to reserve 20% (rather than 5%) of net income.

[41] Federal Reserve Bank of New York (2014), pp. 8-11 projects income net of interest expenses of the System Open Market Account to likely decline noticeably as the outlook for the economy and monetary policy normalizes. But it finds that on a cumulative basis, net income earned from the Federal Reserve System's balance sheet policies is very likely to remain quite high, with SOMA net income exceeding pre-crisis levels even under many alternative scenarios. Moreover, it concludes that "a temporary reduction in net income, even if large enough to prompt a halt to remittances to the Treasury, would not affect the Desk's capacity to conduct open market operations or the FOMC's ability to manage short-term interest rates (page 11)." The conclusion ignores risks to the operational credibility of the Fed's 2% inflation objective emphasized in this paper.

trade should continue to generate around $80 billion per year in net interest earnings. By retaining these earnings the Fed could build capital well above the current $25 billion surplus before interest rate policy exits the zero bound. Each additional $100 billion of surplus capital could finance an additional 3.3% interest on $3 trillion of Fed liabilities for a year, or 1% additional interest for three years. In its role as bank regulator, the Fed sees to it that depositories build up surplus capital commensurate with their prospective financial exposures and risk. The Fed would do well to follow its own guidance.

6) POSTSCRIPT: THE DEBT CEILING AND FED SURPLUS CAPITAL

The federal debt ceiling has the potential to complicate a suspension of Fed-Treasury transfers. The retention of net interest income by the Fed for its surplus capital account forces the sale of more debt if the Treasury doesn't raise taxes or cut spending. The Fed could buy an equivalent amount of Treasury debt in the open market for its enlarged surplus account and return the accrued interest to the Treasury. So there need be no net effect on Treasury finances. However, Treasury securities acquired by the Fed still count as public debt outstanding under the federal debt ceiling; so the sale of new debt by the Treasury to accommodate the build-up of Fed surplus capital would absorb debt capacity under the federal debt ceiling.

As it happens, legislation signed into law in February 2014 suspended the federal debt ceiling through March 2015, allowing the Treasury to sell debt it deems necessary until then.[42] The Fed could use this window of opportunity to suspend transfers to the Treasury, build up surplus capital, and work with the fiscal authorities to facilitate the buildup of its surplus capital after March 2015, perhaps by obtaining an exemption for its holdings of Treasuries from the debt ceiling, at least until the Fed normalizes its balance sheet.

[42] Hook (2014).

REFERENCES

Archer, D. and P. Moser-Boehm (2013) "Central Bank Finances," Monetary and Economic Department, Bank for International Settlements Paper No. 71, (April)

Bernanke, B. S. (2009) "Testimony," *Semiannual Monetary Policy Report to Congress*, Before the Committee on Financial Services, United States House of Representatives, Washington, D.C., July 21, 2009

Board of Governors of the Federal Reserve System (2012) *Annual Report*, Washington, D.C.

Board of Governors of the Federal Reserve System, *Factors Affecting Reserve Balances, H.4.1 Release*, Federal Reserve Board, Washington, D.C. (September 2008, April 2014)

Carpenter, S. B., J. E. Ihrig, E. C. Klee, D. W. Quinn, and A. H. Boote (2013) "The Federal Reserve's Balance Sheet and Earnings: A Primer and Projections," Finance and Economic Discussion Series 2013-01, Division of Research and Statistics and Monetary Affairs, Federal Reserve Board, Washington, D.C.

Christensen, J. H. E., F. X. Diebold, and G. D. Rudebusch (2007) "The Affine Arbitrage-Free Class of Nelson-Siegel Term Structure Models," Federal Reserve Bank of San Francisco Working Paper 2007-20

Christensen, J. H. E., J. A. Lopez, G. D. Rudebusch (2012) "Stress Testing the Fed," Federal Reserve Bank of San Francisco *Economic Letter* (March 24)

Cochrane, J. H. (1999) "New Facts in Finance," Federal Reserve Bank of Chicago *Economic Perspectives* 23, pp. 36-58

Del Negro, M. and C. A. Sims (2014) "When Does a Central Bank's Balance Sheet Require Fiscal Support?" (March 18)

Eisenbeis, R. (2011) Fed Accounting—Is the Problem Solved? *Financial Sense* (http://www.financialsense.com), January 27

Federal Open Market Committee (2014) *Summary of Economic Projections*, (March 18-19)

Federal Reserve Bank of New York (2014), "Domestic Open Market Operations During 2013," (April)

Fry, M. (1993) "The Fiscal Abuse of Central Banks," Fiscal Affairs Department, International Monetary Fund Working Paper 93/58 (July)

Goodfriend, M. (2000) "Overcoming the Zero Bound on Interest Rate Policy," *Journal of Money, Credit, and Banking* (November), pp. 1007-1035

_____ (2002) "Interest on Reserves and Monetary Policy," Federal Reserve Bank of New York *Policy Review* (May), 77-84

_____ (2011a) "Money Markets," *Annual Review of Financial Economics*, vol. 3, pp. 119-37.

_____ (2011b) "Central Banking in the Credit Turmoil: An Assessment of Federal Reserve Practice," *Journal of Monetary Economics* 58 (January), pp. 1-12

_____ and M. Hargraves (1983) "A Historical Assessment of the Rationales and Functions of Reserve Requirements," Federal Reserve Bank of Richmond *Economic Review*, (March/April), 3-21

Government Accounting Office (1996) *Federal Reserve System: Current and Future Challenges Require System-wide Attention*, June

Government Accounting Office (2002) *Federal Reserve System: The Surplus Account*, September

Greenlaw, D., J. D. Hamilton, P. Hooper, F. S. Mishkin (2013) "Crunch Time: Fiscal Crises and the Role of Monetary Policy," NBER Working Paper 19297 (August)

Gurkaynak, R. S., J. H. Wright (2012) "Macroeconomics and the Term Structure," *Journal of Economic Literature* 50:2, pp. 331-367

Hall, R. E., and R. Reis (2013) "Maintaining Central-Bank Solvency under New-Style Central Banking," (February 18)

Hook, J. (2014) "Senate Approves Suspension of U.S. Debt Ceiling," *The Wall Street Journal* (WSJ.com), (February 12)

International Monetary Fund Staff Paper (2013) "Unconventional Monetary Policies—Recent Experience and Prospects," International Monetary Fund, Washington, D.C. (April 18)

Jordan, T. J. (2011) "Does the Swiss National Bank Need Equity?" (September 28)

King, M. (2012) "Speech to the South Wales Chamber of Commerce at the Millennium Centre, Cardiff, October 23

McCauley, R. and P. McGuire (2014) Non-US Banks' Claims on the Federal Reserve, *BIS Quarterly Review* (March), pp. 89-97

Potter, S. (2013) "Recent Developments in Monetary Policy Implementation," Remarks Before the Money Marketeers of New York University, New York City (December 2)