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SYMPOSIUM: SHOULD WE END THE FED AS WE KNOW IT?[†]

The Bernanke Fed and "Credit Easing" Policies, 2008–2014

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Abstract
In the aftermath of the financial crisis, the Federal Reserve pursued a "near zero" overnight interest-rate floor and initiatives to manipulate the size and composition of central bank assets. Bernanke referred to this policy as "credit easing." I provide an overview of the succession of unconventional Fed measures that have yielded a more than fivefold increase in its balance sheet since September 2008 but with economic growth below trend. I highlight three areas of concern: the distortion of asset prices and interest rates, the Fed as a debt enabler, and the $2.6 trillion overhang of bank reserves.

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I. Introduction

In the wake of the financial crisis, the Federal Reserve's approach to monetary policy and the tools it deployed underwent unprecedented changes. Conventional policy—based on open-market operations, principally with short-term Treasury bills to adjust short-term rates—lost its punch in a world of policy-induced, near-zero short-term rates. The Central Bank of Japan pioneered an activist policy of balance-sheet expansion in the presence of zero bond rates, largely to little avail.[1]

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[1] In February 1999, the Bank of Japan (BOJ) announced its intention to adopt a zero overnight rate policy. In August 2000, the policy was ended. From March 2001 to March 2006, the bank adopted quantitative easing. More recently, the BOJ announced a new round of QE policies involving doubling in two years the bank's

The Fed's setting of the federal funds rate at zero in December 2008 (and its maintaining of that rate since then) seemingly left its quiver of tools deficient. The Fed believed that the way out of this dilemma required using a variant of "quantitative easing" (QE) that Ben Bernanke referred to as "credit easing" (CE). As he explained in his Stamp Lecture at the London School of Economics (Bernanke 2009), QE technically refers to monetary policy designed to affect the size of central bank balance sheets, while CE manipulates both the size and the composition of central bank assets, and therefore applies also to various lending and credit-allocation measures.

II. Bernankeism and Credit Easing

The Fed's response to the financial crisis as it emerged in the summer of 2007 was to ease monetary policy by lowering the interbank overnight loan rate by 3¼ percentage points by the spring of 2008 and by an additional 1 percentage point in October 2009. By November 2008, the fed funds rate had been pushed down to 0.4 percent, a drop of 4.7 percentage points. Since May 2013, it has been maintained at 0.1 percent. In effect, by November 2008, the Fed had created the "zero-bound" environment.

The Fed began lending operations to financial institutions in earnest in early 2008 and began providing liquidity to targeted credit markets and institutions by December 2007. Until September 2008, these credit easing programs did not expand the Fed's balance sheet (at $0.83 trillion) because they were offset by selling roughly equivalent dollar amounts of traditional security holdings (largely Treasuries with maturities of under three years), which by September 2008 comprised less than half of the Fed's balance sheet.[2] Up to this point, the Fed had not yet engaged in large-scale asset purchases. But from September to December of 2008, the Fed's total assets increased from $0.93 trillion to $2.2 trillion. This increase involved a substantial shift in the Fed's portfolio stemming from loans to financial institutions and credit markets.[3] By way of comparison, of

government bond holdings that would continue until a 2 percent inflation rate was sustainably achieved. See Kihara and White 2013 and Andolfatto and Li 2014.

[2] Over 60 percent of the Fed's security holdings were traditionally in treasuries with maturities of three years or less. In 2013, that figure was about 8 percent, as reported by Federal Reserve Bank of New York (2014a, p. 4).

[3] These loans were routed through Maiden Lane I, II, and III to support specific firms (JP Morgan, Bear Sterns, AIG, Goldman Sachs) and to provide additional liquidity to institutions and specific markets (Term Auction Facility, Term Securities Lending Facility, Primary Dealer Credit Facility, Commercial Paper

this $2.2 trillion, traditional security holdings accounted for about 25 percent of the Fed's total assets, while sixteen months earlier (in August 2007) such holdings comprised 90 percent of total assets.

During this period, the Fed justified its balance-sheet expansion on "lender of last resort" grounds aimed at providing liquidity to selected financial institutions and markets. However, by early 2009, it supplemented its credit-easing policies with actions geared to massively increasing the Fed's balance sheet by unconventional means, more popularly known as "QE1." At its meeting of January 27–28, 2009, the Federal Open Market Committee (FOMC) issued the following domestic policy directive:

> The Committee directs the Desk to purchase GSE [government sponsored enterprise] debt and agency-guaranteed MBS [mortgage-backed securities] during the intermeeting period with the aim of providing support to the mortgage and housing markets. . . . By the end of the second quarter of this year, the Desk is expected to purchase up to $100 billion in housing-related GSE debt and up to $500 billion in agency-guaranteed MBS. (Board of Governors of the Federal Reserve System 2009a, pp. 9–10)

At its next meeting in March, the FOMC's public statement reaffirmed and expanded on its commitment to keep the federal funds rate close to zero and to engage in large-scale expansion of its holdings of unconventional assets:

> The Committee will maintain the target range for the federal funds rate at 0 to ¼ percent and anticipates that economic conditions are likely to warrant exceptionally low levels of the federal funds rate for an extended period. To provide greater support to mortgage lending and housing markets, the Committee decided today to increase the size of the Federal Reserve's balance sheet further by purchasing up to an additional $750 billion of agency mortgage-backed securities, bringing its total purchases of these securities to up to $1.25 trillion this year, and to increase its purchases of agency debt this year by up to $100 billion to a total $200 billion. (Board of Governors of the Federal Reserve System 2009b, p. 6)

The March 2009 statement also stipulated that that "to help improve conditions in private credit markets, the Committee decided

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Funding Facility, Term Asset-Backed Securities Loan Facility, and other programs). See White 2015 for further details.

to purchase up to $300 billion of longer-term Treasury securities over the next six months" (p. 6).

Fears of deflation spurred the next round of credit easing, often referred to as QE2. The core personal consumption expenditure (PCE) measure of inflation since 2004 hovered at or slightly above the 2 percent target rate until 2009, then dipped to a range of 1.0–1.5 percent during 2010. At its meeting in November 2011, the FOMC decided to expand its balance sheet with additional purchases of longer-term Treasury securities, and it authorized purchases of $75 billion per month from November 2010 through June 2011, an increase overall of $600 billion. The FOMC minutes claimed this expansion was necessary "to promote a stronger pace of economic recovery and to help ensure inflation, over time, is at levels consistent with its mandate" (Board of Governors 2011, p. 9). By July 2011, total Fed assets had increased to $2.87 trillion.

From September 2011 through December 2012, the Fed rehabilitated a modern version of "Operation Twist" from the early 1960s. Like that earlier policy, the Fed engaged in sterilized purchases of longer-term Treasuries via the sale of short-term Treasuries. During this period, the Fed's balance sheet held virtually constant at about $2.8 trillion. The objective was to spur investment, especially in the housing market, yet the economy continued to sputter.

The continuing weakness in the economy, especially in employment, induced the Fed to embark upon a third round of CE in September 2012. This round, often referred to as QE3, resumed the Fed's purchases of MBS at a rate of $40 billion per month, which was augmented by an additional $45 billion per month in long-term Treasuries starting in December 2012 (after "Operation Twist" ended). Unlike its previous CE programs, the Fed left open its targeted magnitudes and time frame. However, in August 2013, the Fed announced a program of "tapering" of the $85 billion in monthly purchases. Beginning in December 2013, it decreased its purchases by $10 billion per month (equally apportioned between MBS and longer-term Treasuries) in December 2013, January 2014, and March 2014. As of early July 2014, total Fed assets were $4.45 trillion (Board of Governors of the Federal Reserve System 2014a).

III. Bernankeism in Theory: How Is Credit Easing Supposed to Work?

Modern Keynesian monetary orthodoxy centers its attention on demand management to stimulate a slumping economy. In general

(and prior to the financial crisis), the principal instrument of the Fed (and other central banks) was a short-term interest rate at which the Fed provided funds to the overnight market. This "official rate" was thought to be systematically and quantifiably related to the wider economy, as expressed, for example, by Taylor rules. Thus, for a given inflation target, some corresponding federal funds rate could be inferred for a particular equilibrium value of the non-accelerating inflation rate of unemployment (NAIRU).[4] Yet, when the central bank has driven the federal funds (or overnight) rate to near-zero levels, interest rate manipulation via conventional monetary tools cannot force the overnight rate below its "zero bound." In addition, "the disconnection between official rates and market rates meant that conventional monetary policy ceased to be effective in the aftermath of the financial crisis" (Joyce et. al. 2012, p. 276). The Fed's response, as formulated during 2008 and 2009, was to adopt unconventional means for conducting monetary policy involving large-scale increases in its balance sheet and also targeted changes in the composition and kinds of its asset holdings.

Bernanke has long maintained that monetary policy is transmitted to the wider economy through changes in the prices and yields of assets that affect aggregate demand through "a balance sheet channel" (Bernanke and Gertler 1999, p. 20).[5] Bernanke placed secondary quantitative importance on the wealth channel for affecting consumption, suggesting that various credit market frictions impede borrowing and lending, making cash flows and the condition of balance sheets key factors connecting asset prices and aggregate demand. These balance-sheet effects, in conjunction with the standard wealth effect, can be systematically generated if the Fed's

[4] At the FOMC meeting of January 24–25, 2012, the Fed expressed its "statutory mandate from the Congress" as "promoting maximum employment, stable prices, and moderate long-term interest rates" (Board of Governors of the Federal Reserve System 2012, p. 7). The FOMC also made explicit a long-run inflation goal of 2 percent (as measured by the PCE Index) while averring as to the empirical measure of "maximum employment" because it is "largely determined by nonmonetary factors that affect the structure and dynamics of the labor market" that "may change over time and may not be directly measurable [and] consequently, it would not be appropriate to specify a fixed goal for employment" (p. 8). That said, the FOMC provided a range of "central tendency" estimates of 5.2–6.0 percent (Board of Governors of the Federal Reserve System 2012). Bernanke et al. (1999) argued for the adoption of explicit inflation targeting by the Fed.

[5] This harkens back to earlier literature by Tobin (1961) and Brunner and Meltzer (1973) that emphasized the "portfolio balance" channel.

purchases of specific assets—say, long-term Treasuries—are large enough to alter the relative prices of securities (Bernanke and Reinhart 2004, p. 86).[6]

By far, most of the increases in the Fed's balance sheet since 2007 have been due to the Fed's purchases of MBS and longer-term Treasuries. As of mid-July 2014, the Fed's total assets were about $4.4 trillion, of which $2.04 trillion were longer-term Treasury purchases and $1.67 trillion were MBS purchases. This represents a more than five-fold increase in the Fed's balance sheet since 2009. These asset-purchasing programs are the actions of a big player capable of altering asset prices and yields.[7] At the end of 2013, for example, the Fed had purchased about 45 percent of all outstanding ten- to thirty-year Treasury securities, almost 35 percent of six- to ten-year Treasuries, and over 30 percent of three- to six-year Treasuries (MarketWatch 2014). These programs have reduced long-term Treasury yields with the goal of supporting investment via lower loan rates while also keeping yields of MBS securities (and mortgage rates) at levels to support the housing market. In general, Bernanke's (and now Janet Yellen's) credit easing policies have sought to provide an ongoing stimulus to the economy by forcing lower interest rates in key asset markets in the midst of near-zero short-term rates.

The way credit-easing policies affect the economy is subject to certain conditions. Curdia and Woodford (2011) develop a model of Fed purchases of government bonds under a near-zero overnight interest rate and find that QE is ineffective. This result arises from the perfect substitutability of reserves and short-term Treasuries. Because these assets are indistinguishable, the swap of bonds for reserves is fully neutral.[8] This result, however, requires independence between short-term Treasury yields and longer-term mortgage rates, corporate bonds, and other assets. To the extent that "segmentation is narrow" (Cochrane 2011a), a program of Fed purchases of longer-term Treasuries will largely be confined to altering those yields; alternatively, if assets in general are substitutes, QE will generate wider effects.

These actions have also affected financial markets in other ways. The Fed's asset purchases are transacted with the Fed's "primary

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[6] Bernanke and Gertler (1999) almost presciently note that "the same logic might lead the central bank to consider purchasing assets other than government bonds, such as corporate bonds or stock or foreign government bonds" (p. 86).

[7] On "big players," see Koppl (2002).

[8] This is fully equivalent to Ricardian equivalence in the fiscal arena.

dealers," who are obligated to serve as "trading counterparties of the New York Fed in its implementation of monetary policy" (New York Federal Reserve Bank 2014b).[9] These dealers engage in more diverse lines of business than traditional banks and have extensive global connections. Their clients include hedge funds, holders of international sovereign wealth assets, and ordinary investors. The Fed's credit-easing programs, which have emphasized long-term Treasuries and MBS, have pushed up the prices of these assets while lowering their yields, providing a strong incentive for sellers of these assets to use the proceeds to seek higher yields in equity markets and in real assets, principally in real estate. These effects have been prominent both domestically and internationally, generating an extraordinary period of asset price inflation as a principal byproduct of Bernanke's attempt to exploit the "balance sheet" channel.

Meanwhile, starting in 2008, Congress authorized the Fed to pay interest on depository institutions' reserve balances held at the Fed.[10] Set at a level of 0.25 percent and given the narrow spread between the rate on bank loans and the rate on reserves, the level of excess reserves has increased from $1.9 billion in 2007 to $2.6 trillion as of July 23, 2014. This increase has served the Fed in two ways. First, despite the five-fold increase in the Fed's balance sheet, the magnitude of excess reserves has restrained growth in the money stock and commodity inflation. Second, the payment of interest on reserves provides yet another policy tool for the Fed by establishing a lower bound on the federal funds rate.

IV. Credit Easing: Consequences and Prospects

The economy appears, as of July 2014,[11] to be languishing somewhere between a modest recovery and a low-growth slump. According to the Bureau of Labor Statistics, commodity inflation has been stable at

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[9] The New York Federal Reserve lists twenty-two primary dealers: Bank of Nova Scotia, BMO Capital Markets, BNP Paribas Securities, Barclays Capital, Cantor Fitzgerald, Citigroup Global Markets, Credit Suisse Securities (USA), Daiwa Capital Markets America, Deutsche Bank Securities, Goldman, Sachs & Co, HSBC Securities (USA) Inc., Jefferies, J.P. Morgan Securities, Merrill Lynch, Mizuho Securities USA, Morgan Stanley & Co., Nomura Securities International, RBC Capital Markets, RBS Securities, SG Americas Securities, TD Securities (USA), UBS Securities. See Federal Reserve Bank of New York 2014b.

[10] In 2006, Congress passed the Financial Services Regulatory Relief Act, authorizing the payment of interest on reserves starting in October 2011. This date was changed to 2008 by the Emergency Economic Stabilization Act of 2008.

[11] See postscript for updated comments.

about 2.0 percent for several years. Even though real gross domestic product (RGDP) has at times shown modest growth, its improvement has been fitful since 2010, with RGDP growth below trend. Measured unemployment has fallen from over 9 percent in 2009 to 6.3 percent (as of June 2014), but the labor-force participation rate has declined from about 66 percent in 2009 to 63 percent in 2014, the lowest since the 1970s. In July 2014, the measured number of individuals leaving the workforce exceeded the increase of 200,000 who became employed. Overall, the pace of the recovery has been the slowest of any since the end of World War II.

Other aspects of the Fed's credit easing have not been as evident but still raise relevant concerns centering on the distortion of asset prices and interest rates, the Fed as debt enabler, and the overhang of reserves.

A. Distortions

If we go back to 2009–2010, when the Fed's purchases of long-term Treasuries and MBS had not yet begun, the size of its balance sheet was about $2 trillion, of which about $0.8 trillion was "traditional security holdings" and the remaining $1.2 trillion in assets was from the liquidity and loan programs related to the financial crisis. In July 2014, the Fed's balance sheet was $4.4 trillion, of which $3.4 trillion was in long-term Treasuries and MBS. This growth represents a concentrated, massive, and targeted intervention into financial markets intended to affect the structure of asset prices and their yields and, therefore, how financial capital gets allocated.

The Fed views financial markets and their emergent characteristics (prices and yields) as data to be manipulated, and it has gone to great lengths in doing so for prices of financial assets, negating market assessment by risk suppression and altering relative yields across the spectrum of financial assets. After five years of altering market signals, their informational content becomes detached from market realities, making it reasonable to ask, "What is real?" One consequence is that financial markets have been turned into a "house of mirrors," and the game has become a chaotic Keynesian beauty contest subject to unmoored expectations that can give rise, as Brown (2014) highlights, to unsustainable asset price inflation. The secondary effects of bursting bubbles—asset price deflation and widespread financial disruption—may affect related sectors with the attendant real sector effects required for market corrections.

Entangled with this is the suppression of interest rates in general below their natural levels. According to Austrian business cycle theory, this is a necessary condition for an unsustainable boom to develop. Yet, under Bernanke (and Yellen), the excess reserves the Fed has pumped into the system have been largely sterilized by the banking system and have not, by and large, entered into commercial lending markets. As discussed in section C of this paper, this scenario could quickly change. So far, however, the principal (and temporary) beneficiaries of credit easing distortions have been the equity markets and holders of long-term Treasuries and MBS.

Needless to say, whatever specific distortions arise, consequences follow. Perhaps most obviously, once credit easing tapers off, we would expect asset prices of long-term Treasuries and MBS to stop rising (or to fall) and yields to rise, triggering portfolio adjustments throughout the financial sector. Ironically, this shift would significantly affect the value of the Fed's portfolio, inducing a large capital-value loss on its assets. But it will likely also affect equity markets and pressure prices to fall, as markets work to restore a semblance of order to prices and yield.

B. The Fed as Debt Enabler

The low interest rates promulgated by the Fed's credit easing allow the Treasury to finance government debt at a discount. This outcome can be viewed as simply a byproduct of the Fed independently implementing its dual mandate. Nonetheless, it is actual effects that demand analysis, irrespective of intentions.

The federal debt as of July 2014 stands at $17.5 trillion. Even though deficits are declining, the CBO (2014) expects deficits to begin increasing in 2016 and thereafter. The CBO also projects that under current law, the ratio of debt to GDP will reach 106 percent by 2039 and continue to increase thereafter. Whereas GDP reflects an economy's ability to pay down its public debt, the larger that ratio, the larger are the costs of servicing that debt, and the greater is the proportion of tax receipts spent on interest payments. The simple mathematics among debt, GDP, and the cost of servicing debt under a given tax system allow us to relate the interest rate (as the cost of servicing the debt) to the growth rate of GDP (which represents the system's ability to provide tax revenue, and thus reduce the debt-to-GDP ratio). The following result is obtained: if the interest rate on

government bonds (i) is greater than the nominal growth rate of GDP (n), then the debt-to-GDP ratio increases.[12]

This result indicates that lower servicing costs allow the system to more easily finance debt and to delay the onset of an unsustainable debt-to-GDP ratio. The Fed's policy of exceptionally low interest rates has allowed the government to service the debt at a lower cost and may have reduced pressures for tax hikes or for reductions in government spending.[13] The distortions arising in the private sector from artificially low interest rates are similarly applicable to expenditures made by the government under a regime of low interest rates.[14]

C. Reserves Overhang and Exit Strategy

As of July 2014, depository institutions held excess reserves of $2.624 trillion,[15] a consequence (as noted earlier) of the interest spread on short-term debt and the 0.25 percent interest rate the Fed pays on reserves. While short-term rates remain within the near-zero range,

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[12] We can write $b_t = d_t + b_{t-1}\ (1 + i)$, where this year's nominal debt (b_t) equals this year's deficit (d_t) plus the existing debt and its interest cost ($b_{t-1}[1 + i]$). When we measure these debt and deficit numbers in terms of nominal GDP, and using some algebraic manipulations, we end up the following: $B_t = D_t + B_{t-1}\ [(1 + i) / (1 + n)]$, where

B_t = new debt as a fraction of nominal GDP
D_t = primary deficit as a fraction of nominal GDP
B_{t-1} = existing debt as a fraction of nominal GDP
i = interest cost of debt
n = growth rate of nominal GDP
$(1 + i) / (1 + n)$ = interest on debt relative to growth rate of nominal GDP

Some algebraic manipulation gives the relationship between interest cost (i) and the growth rate in nominal GDP (n), as given in the text. Note that the higher the inflation rate, the higher is GDP and the less onerous the servicing costs for a given interest rate.

[13] The government's failure to address the long-term prospects of public debt can trigger expectations of future higher inflation over which the central bank has little direct control. See Cochrane (2011b).

[14] Interest rate distortions feeding into commercial lending will affect the time structure of production, the analysis of which is the purview of the Austrian theory of capital and business cycles. Yet, absent massive bank lending of reserves, asset price inflation and the fiscal distortions and excesses of government deficits thus far may be the main effects of credit easing. Are these effects cousins to Austrian cycle theory? Unfortunately, a detailed analysis of these connections cannot be undertaken here. I thank Steve Horwitz for raising this point.

[15] Daily averages for the two weeks ending July 23, 2014. See Board of Governors of the Federal Reserve 2014c. Until the Fed ends its ongoing asset purchases, banks will likely continue to increase their excess reserve holdings.

reserves and short-term debt are close enough substitutes that encourage banks at the margin to hold reserves in lieu of issuing liabilities and taking on private-sector debt. Yet, as market rates rise with a modestly improving economy (or with heightened inflationary expectations) together with the unwinding of the Fed's long-term Treasury and MBS purchases (and possible cessation in October 2014), the spread between interest on reserves and bank lending rates is likely to increase. The existing level of excess reserves is capable of supporting a massive expansion of bank credit and a self-reinforcing process of commodity inflation and inflationary expectations.

The contours of the Fed's exit strategy for normalizing monetary policy are still, as of July 2014, unclear. At the June 2014 meeting, the FOMC indicated that under current forecasts, "it likely would be appropriate to maintain the current range for the federal funds rate for a considerable time after the asset purchase program ends, especially if projected inflation continued to run below the Committee's two percent longer-run goal, and provided that longer-term inflation expectations remained well anchored" (Board of Governors of the Federal Reserve System 2014b, p. 11). At that same meeting, substantial discussion centered on "monetary policy normalization" (pp. 2–4) in which "most participants agreed that adjustments in the rate of interest on excess reserves should play a central role during the normalization process" (p. 2). Presumably, as market rates rise, the Fed would ratchet up the interest on excess reserves as a means to control the flow of bank credit.

But the FOMC at its June 2014 meeting also discussed the possibility of other tools, including continuing the Fed's overnight reverse repurchase program, that could be deployed during the normalization process. FOMC statements indicate "general agreement" that an overnight reverse repurchase facility with an interest rate set below the rate on excess reserves "could play a useful supporting role by helping to firm the floor under market interest rates" (pp. 2–3). Other options discussed include the possibility of discontinuing the Fed's current policy of rolling over maturing Treasury securities and MBS.

These discussions have not yet resulted in a firm strategy for normalizing monetary policy. In its June 2014 "Directive," the FOMC makes plain that its strategy going forward is not "pre-set" but "contingent on the Committee's outlook" for labor market conditions, inflation, and its "assessment of the likely efficacy and costs of [asset] purchases" (p. 12). In short, as of July 2014, there is

still considerable uncertainty as to the nature and timing of the Fed's exit strategy.

V. Conclusion

Bernanke (2014) claims that a key determinant of successful monetary policy is the Fed's commitment to transparency, accountability, and consistency. According to him, asset prices and economic activity, even under near-zero short-term interest rates, can be affected by "influencing market participants' expectations of future short-term rates" provided the central bank's commitment is credible (Bernanke and Reinhart 2004, p. 85). Yet, success in these terms masks a variety of potential problems inhering in the credit-easing policies themselves.

Layered on that are other issues that go beyond the limited purview of this paper. For example, the Fed's inability or reluctance to provide relevant information concerning its strategy for normalizing monetary policy adds yet another layer of uncertainty hindering financial markets and the wider economy. It also illustrates an ongoing theme that starting in 2009—and perhaps during the 2007–2008 period, as well—the Bernanke Fed's CE policy was largely experimental and possibly ad hoc. That it has also been ineffective adds to the prospect that the Bernanke Fed has damaged the economy by suppressing market signals and adjustment processes.[16]

Postscript

This paper has discussed the Federal Reserve's "credit easing" policies as of early fall 2014. Since then, the Fed, under Chair Janet Yellen, sworn in on February 3, 2014, has continued the general approach of Bernanke in holding large quantities of longer-term Treasuries and MBS on its balance sheet. In October 2014, the Fed announced it would conclude its asset purchase program by only reinvesting payments from its holdings of MBS and agency debt and rolling over maturing Treasuries. Since then, the Fed's balance sheet has been maintained at about $4.5 trillion.

But the same problems, as discussed earlier, confronting the Federal Reserve under Yellen remain in play; indeed, these problems have recently become more critical and complicated as the time for "normalizing" monetary policy assumed increased importance as the

[16] For a contrary assessment, see Bernanke (2014).

economy and labor markets rebounded, albeit tepidly. In September 2014, the FOMC expanded on its June 2011 statement of normalization by announcing a series of operations it would undertake if conditions warranted normalization of monetary policy. First, the FOMC would adjust the interest it pays on excess reserves to keep the federal funds rate within its target range; at its March 2015 meeting, the FOMC agreed to set the interest on excess reserves at the top of the target range for the federal rate. Second, the FOMC would engage in reverse repurchase (RRP) operations to set a lower bound on the overnight rate. In September 2014, the FOMC authorized up to $300 billion of RRP operations followed by additional authorizations of $300 billion in December 2014 and $250 billion in January 2015 (Frost et al. 2015). Together, these tools of interest on excess reserves and RRP are meant to control the level of short-term rates in an environment of significant excess reserves.

As of October 30, 2015, the FOMC has determined that conditions do not yet warrant commencing with normalizing monetary policy. The Fed has not yet raised the interest on excess reserves, yet, as we have seen, the RRP program has been active since 2014. There is some evidence suggesting that the RRP program is being employed in an attempt to control overnight rates in a money market with a huge overhang of excess liquidity, which might complicate the ability to actually raise rates when the Fed decides rates need to be raised (Burne 2015).

The Fed's hand-wringing over whether or when to raise rates has heightened uncertainties for market players and induced ambiguity in the Fed's conduct of monetary policy. In recent FOMC minutes, Yellen press conferences, and Federal Reserve press releases, the criteria used for monetary policy has expanded in ways that are likely to confuse market players and bring into play "wild cards" that diminish signal quality. Beyond this, some commentators see increasing divisions within the FOMC regarding the timing of normalizing monetary policy. The general view of the FOMC (and Yellen) is that inflation becomes increasingly likely as labor markets tighten. But FOMC members L. Brainard and D. Tarullo in separate speeches recently questioned that claim, urging that raising rates now is premature (Lahart 2015). As O'Driscoll (2015), notes, "Janet Yellen . . . remains wedded to the Phillips Curve. It is unusual for two Governors to so publicly deviate not only from the Chair's policy guidance but also from the policymaking framework." While O'Driscoll wonders if Yellen is "losing control over the FOMC," we

might also speculate whether the Fed has simply painted itself into a corner.

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