

FEDERAL RESERVE MISCHIEF AND THE CREDIT TRAP

Daniel L. Thornton

The Federal Reserve's monetary policy response to the financial crisis is a disaster. The financial crisis began on August 9, 2007, when BNP Paribas suspended redemption of three investment funds. The Fed responded first by reducing its lending rate (the primary credit rate) and then by reducing its target for the federal funds rate from 5.25 percent on September 17, 2007, to 2 percent on May 1, 2008. Despite these actions the recession worsened and the financial crisis intensified (see Thornton 2014a).

Instead of increasing the monetary base (the Fed's contribution to the supply of credit) as it should have, and as Friedman and Schwartz (1963) recommended, the Fed sterilized the effect of its lending on the supply of credit by selling an equivalent amount of Treasury securities. This forced the market to reallocate credit to the institutions to which the Fed made loans (see Thornton 2009). It did this so it could continue to implement monetary policy with the federal funds rate. Had the Fed not sterilized its lending, the reserves created would have made it impossible to keep the funds rate much above zero. Indeed, the Fed attempted to sterilize its massive lending following Lehman's September 2008 announcement by having the Treasury issue supplemental financing bills and deposit the proceeds with the Fed (as much as \$559 billion). Despite these efforts,

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the monetary base exploded, doubling in size from August to December 2008. The funds rate headed for zero, well below the Fed's 2 percent target and well in advance of the FOMC reducing the target to zero on December 15 (see Thornton 2015).

Then, instead of simply allowing its balance sheet to shrink back to its pre-Lehman level as the economy improved and lending was repaid, as would have been appropriate, the Fed engaged in a massive purchase of long-term securities—quantitative easing (QE)—in an attempt to stimulate economic growth by reducing long-term yields.

However, in this article I show why both QE and the FOMC's forward guidance policy actually had virtually no effect on long-term yields. On the other hand, the FOMC's 8-year low interest rate policy has caused long-term yields to be lower than they would have been otherwise. It is important to draw this distinction because it pinpoints the real source of the Fed's mischief.

The FOMC's low interest rate policy has resulted in excessive risk taking by citizens, pension funds, banks, and other financial institutions; a large and likely an unsustainable rise in asset prices; and an unprecedented increase in the money supply. The low interest rate policy has also distorted the allocation of economic resources in a variety of ways, many of which are impossible to determine, and may have effects that are impossible to predict. These results are the consequence of a policy that was ill conceived, motivated by fear, and lacking theoretical foundations. The last point applies to the FOMC's low interest rate policy as much as to QE and forward guidance, as it is predicated on a model that lacks empirical support and has a theoretically weak central premise. In short, the FOMC's low interest rate policy has not only failed to deliver but has also had terrible and potentially drastic consequences. An increasing number of analysts are beginning to realize this. Unfortunately, none of them are members of the FOMC.

In what follows, I will discuss the consequences of the FOMC's low interest rate policy and speculate on how it might end. I will conclude by arguing that the Fed's mischief is just the latest installment in the long history of the credit trap—a trap facilitated, if not caused, by the widespread acceptance of Keynesian economics. I will begin, however, by showing why QE and forward guidance should not have had—and, in fact, did not have—a significant effect on long-term yields.

Doomed to Fail

QE and forward guidance were doomed to fail because their theoretical foundations are made of sticks, not bricks. Bernanke (2012), Gagnon et al. (2011), and others argued that QE reduced long-term interest rates through the so-called portfolio-balance channel, and by reducing term premiums on long-term debt. However, their version of the portfolio-balance channel requires that markets are segmented beyond the degree determined by the risk characteristics of bonds and market participants' aversion to risk. Specifically, it requires the market to be segmented along the yield curve, which is at odds with over 50 years of finance theory. Bernanke and others suggest that such circumstances prevailed after Lehman Brothers' bankruptcy announcement. But even this seems unlikely: the collapse of the interbank and other markets was more likely due to the fact that most banks and other financial institutions had a large quantity of mortgage-back securities (MBS) and other derivatives on their balance sheets. These securities were "toxic"—that is, no one knew exactly what they owned and, by extension, the real value of those holdings. Banks did not know the credit risk of their own MBS, let alone those of other banks. Consequently, the interbank market froze up. Other markets were also impaired. Credit risk premiums skyrocketed. But only temporarily, as is shown in Figure 1, which displays the spread between the 3-month CD and T-bill rates weekly over the period January 2007 through December 2009. This spread, which had risen from 56 basis points the week before the financial crisis began to 119 basis points the week before Lehman's announcement, jumped to 344 basis points the week of that announcement. The spread peaked at 437 basis points for the week ending October 17. Yet just as economic theory would predict, financial markets soon healed and credit risk premiums declined. By the week ending January 9, 2009, the spread was down to 96 basis points—below the pre-Lehman level. By early May, the spread dropped well below its pre-financial crisis level and remained there.

Other credit-risk spreads behaved similarly, although some returned to their pre-Lehman level more slowly. For example, Figure 2 shows the bi-weekly spread between Baa and Aaa corporate bonds yields over the same time period. The spread increased after the onset of the financial crisis and exploded following Lehman's announcement. It peaked in late December at 350 basis points.

FIGURE 1
THE 3-MONTH CD/T-BILL SPREAD (WEEKLY DATA)

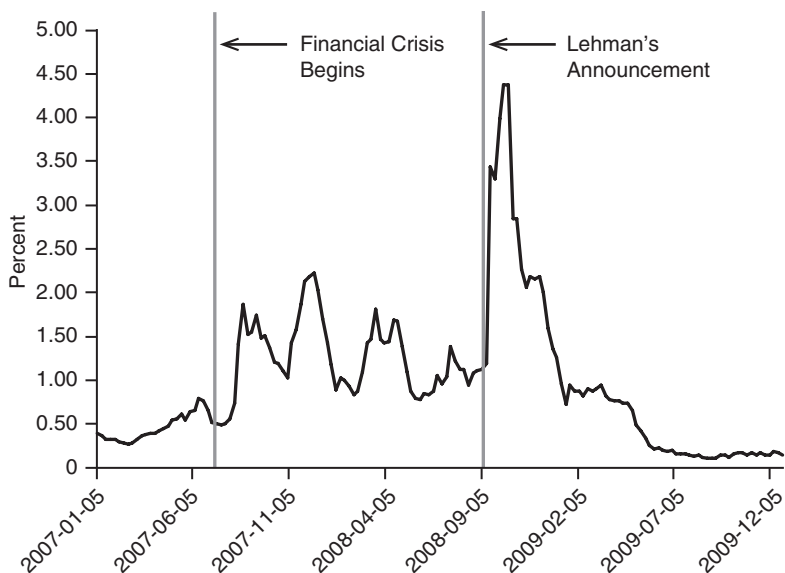
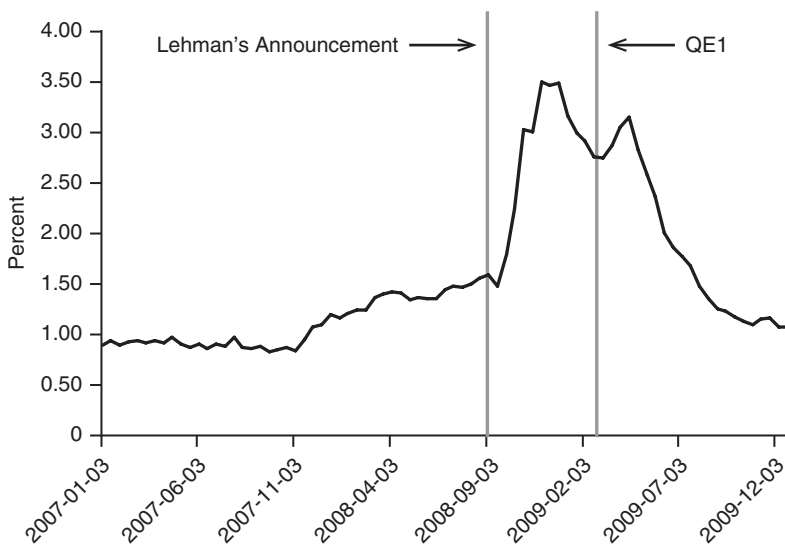


FIGURE 2
BAA/AAA CORPORATE BOND SPREAD
(BIWEEKLY DATA)



Its decline was briefly interrupted when the FOMC announced that the Fed would purchase a total of \$1.75 trillion in long-term debt, because Baa yields rose relative to Aaa yields. However, this spread returned to its pre-Lehman level, about 150 basis points, by the two-weeks ending August 12. It continued to fall as the Baa yield fell relative to the Aaa yield as both yields declined.

There is no reason to believe that markets were segmented along the term structure on May 18, 2009. By these spreads and other indicators, markets were functioning well by the time the FOMC launched its massive QE program. Consequently, there is no reason to believe that QE had any significant effect on long-term yields—or on the structure of rates generally—through the portfolio-balance channel. While large by historical standards, the Fed's purchases were simply too small to have any significant effect on the level of the overall structure of interest rates (Bauer and Rudebusch 2014). Any such effect would be so small as to be undetectable.

The idea that QE reduced term premiums, which was hypothesized to occur because the Fed's purchases removed a large quantity of interest rate risk from the market, is equally fanciful. The term premium of a long-term bond relative to a short-term bond depends on two things; both are independent of the amount of bonds in the market. The first is the relative duration risk of the two bonds, which is determined solely by the relative durations of the bonds, which in turn rests on those bonds' characteristics (e.g., their relative maturities, call provisions, collateral, and so on). The second is the risk aversion of market participants, which is innate to each investor. In the case of default-risk-free Treasuries, this means the risk premium could decline only if the Fed's purchases caused the most risk-averse investors to leave the market. This seems unlikely: the most risk-averse investors are surely more likely to *remain* in the default-risk-free Treasury market, while the least risk-averse investors seek higher returns elsewhere. In that scenario, term premiums would rise, not fall. In any event, whether the term premium falls or rises depends solely on who stays in and who leaves the market.

The empirical evidence for QE significantly reducing long-term yields is no more compelling. Gagnon et al.'s (2011) present time-series evidence suggests that the FOMC's \$1.75 trillion bond purchase reduced the term premium on 10-year Treasuries by between 38 and 82 basis points. However, as I pointed out in Thornton (2014b), that finding rests on an error that the authors made in constructing their

“supply” measure, and was arrived at only because the authors ignored common trends in their supply, bond yield, and term premium variables.¹ When these problems are corrected, there is no evidence that QE reduced the 10-year term premium *or* the 10-year Treasury yield.

The most commonly cited evidence that QE reduced long-term yields comes from event-studies. Event-studies look at the high frequency response of long-term yields to the FOMC’s QE or forward guidance announcements. However, for QE to be said to have a significant effect on output and employment, the effect on long-term rates must be permanent. This is not the case: long-term yields are most often higher for an extended period following the most important QE announcements (see Thornton 2015: 20).

Furthermore, that QE event-study evidence does not meet the minimum evidentiary standard (see Thornton 2016a); namely, that announcement effects must be statistically significant and must be due solely to QE news. Only the March 18, 2009, announcement effect satisfies these requirements. But this announcement effect was so short-lived that it caused Janet Yellen to alter her opinion about the effectiveness of Treasury purchases on Treasury yields (Thornton 2015: 10–11). In any event, the estimated announcement effects are typically small unless they are summed over the entire QE period, as is the case with some researchers (e.g., Gagnon et al. 2011 and Neely 2015). That approach can be justified only if interest rates are true random walk processes—which they certainly *are not*.

The theory and evidence that forward guidance significantly reduced long-term yields is equally weak. Forward guidance is based on the expectations hypothesis of the term structure of interest rates, which suggests that the long-term interest rate is determined by market participants’ expectations for the short-term rate over the holding period of the long-term security, plus a maturities-specific term premium. The expectations hypothesis has been massively rejected using a variety of long- and short-term rates, sample periods, and monetary policy regimes (Campbell and Shiller 1991; Sarno, Thornton, and Valente 2007; and Della Corte, Sarno, and

¹Specifically, from the public’s holding of Treasuries the authors subtract foreign official holdings of non-Treasuries, which causes their measure of the public’s holding of Treasuries to be negative after November 2007.

Thornton 2008). This is not surprising, for a number of reasons: not the least of which is the fact that the expectations hypothesis is not a fully-specified theory (see Thornton 2017).

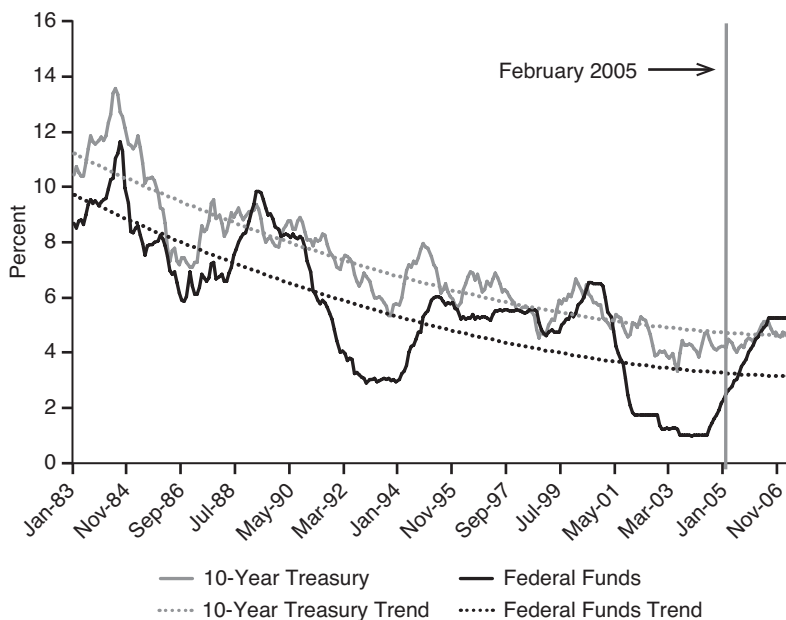
Furthermore, as Woodford (2012) notes, the effectiveness of forward guidance depends on the creditability of the Fed's commitment. That means the FOMC essentially eliminated forward guidance at its December 2012 meeting, when it replaced its state-contingent forward guidance with the statement, "To support continued progress toward maximum employment and price stability, the Committee expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the asset purchase program ends and the economic recovery strengthens." Saying "we won't raise the funds rate until we decide to" can hardly be considered creditable and effective forward guidance. Consistent with these observations, Kool and Thornton (2016) find that no central bank's forward guidance policies actually produced the intended effect.

It is particularly interesting that QE and forward guidance are based on diametrically different theories of financial markets. The expectations hypothesis assumes a high degree of substitutability among bonds across the term structure, while the effectiveness of QE is based on the assumption that markets are segmented across the term structure. Hence, if QE is effective, forward guidance cannot be, and vice versa. This suggests that, in its response to the financial crisis, the FOMC was either highly irrational or hedging its bets.

The Effect of the FOMC's Low Interest Rate Policy

Given their lack of theoretical foundations, and the absence of empirical evidence to support them, it seems unlikely that QE or forward guidance caused long-term rates to be lower than they would have been otherwise. Nevertheless, I am certain that the FOMC's low interest rate policy did, in fact, have this effect. I base this conclusion on my investigation of Greenspan's famous "conundrum" (see Thornton 2016b). In his February 2005 congressional testimony, Greenspan (2005) observed that the 10-year Treasury yield was essentially unchanged despite the fact that the federal funds rate target had been increased by 150 basis points. This is shown in Figure 3, which displays the federal funds rate and the 10-year Treasury yield over the period March 1983 to March 2007 (the vertical line denotes February 2005). Greenspan considered several possible explanations

FIGURE 3
FEDERAL FUNDS AND 10-YEAR TREASURY RATES



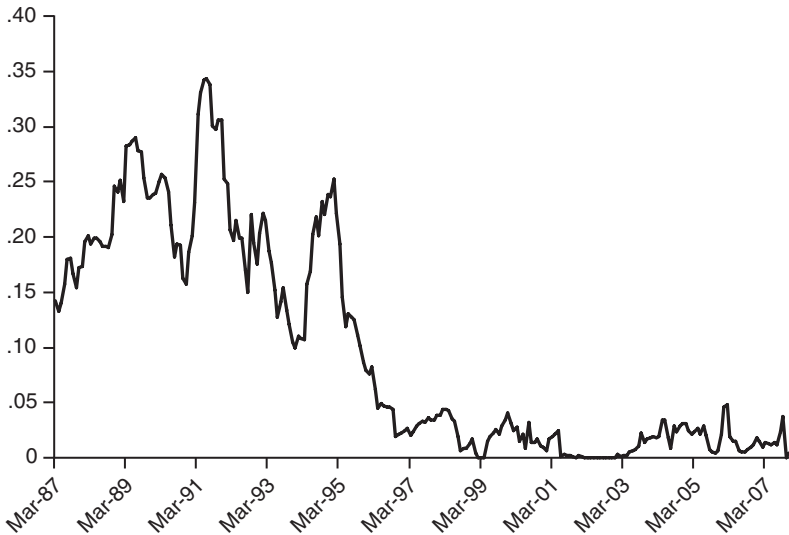
for what he saw as the 10-year yield’s aberrant behavior. Rejecting them all, he declared it a conundrum.

My investigation of this conundrum suggests that the change in the relationship between the funds rate and the 10-year yield occurred in the late 1980s, long before Greenspan noticed it. Moreover, the change was not due to aberrant behavior on the part of the 10-year Treasury, as Greenspan and subsequent researchers assumed. Rather, it occurred because the FOMC began using the federal funds rate as its policy instrument.

The effect of this change on the relationship between the funds rate and the 10-year Treasury yield is shown in Figure 4. The figure presents the 48-month rolling estimate of R^2 from a regression of the change in the 10-year Treasury yield and the federal funds rate (the data are potted for the last observation in the window). Estimates of R^2 fluctuate around 20 percent until the mid-1990s, then fall to zero and stay there.

I did a statistical test to determine the most likely date of the change; the test indicated May 1988. The FOMC transcripts also

FIGURE 4
48-MONTH ROLLING ESTIMATES OF R^2



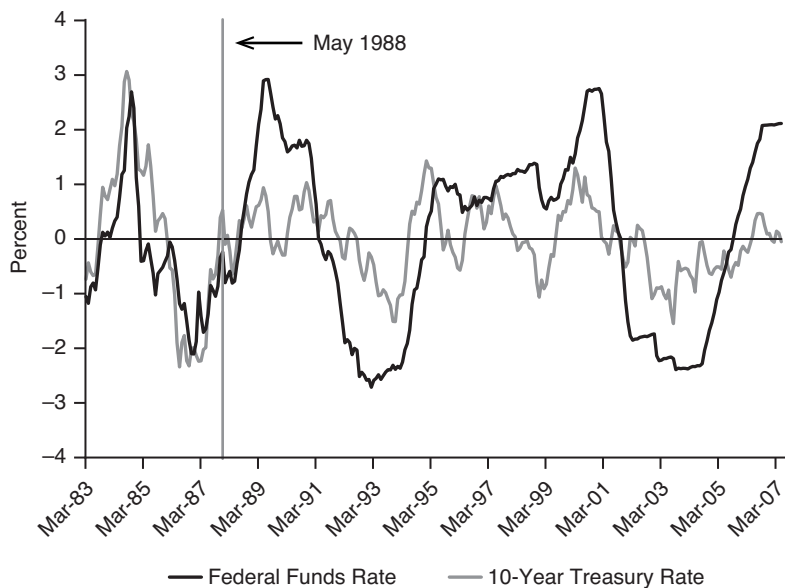
support this date. Greenspan couldn't explain the aberrant behavior of the 10-year yield because that wasn't what changed. What really happened is that, once the FOMC started targeting the funds rate, that rate changed only when the FOMC moved its target. The 10-year Treasury yield, on the other hand, continued to respond to economic fundamentals.

Figure 4 also shows this change in the behavior of the federal funds rate. After the late 1980s, the funds rate moves with the FOMC's target and is less affected by news about economic fundamentals. The relationship between the funds rate and the FOMC's funds rate target became increasingly close as the FOMC became increasingly open about the target rate.

This change in the relationship between the 10-year Treasury yield and the funds rate went unnoticed for so long because both rates were trending down. The common trends in the two rates can be seen in Figure 3. The spread between the trends is 141 basis points.² Greenspan noticed the change in early 2005 because by then

²These trend lines are restricted to be identical. However, the trends are nearly identical to those shown even without that restriction.

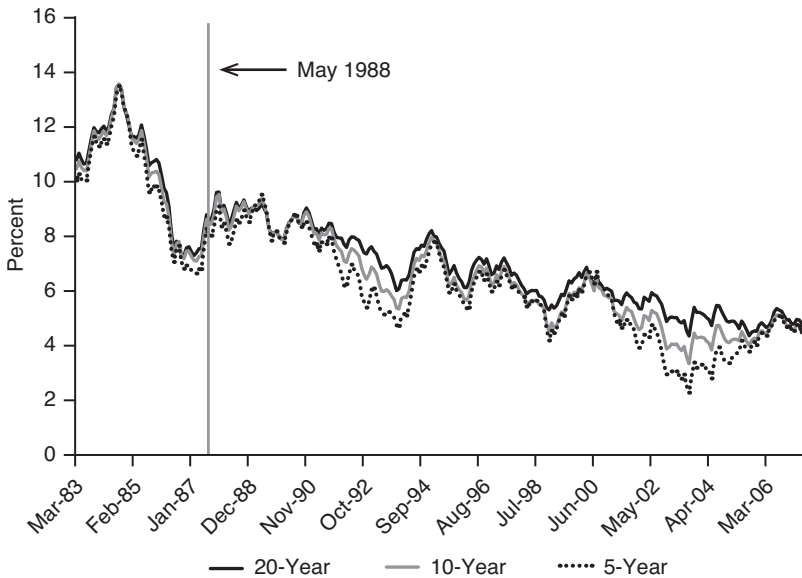
FIGURE 5
DETRENDED 10-YEAR TREASURY AND
FEDERAL FUNDS RATES



the trends were flattening out. However, the dramatic effect of the FOMC's adoption of the funds rate as its policy instrument on the relationship between the levels of the rates is obvious when the common trends are removed, as shown in Figure 5. Both rates move closely together until the late 1980s, but move more independently thereafter. There are periods when the rates are positively correlated, negatively correlated, or uncorrelated.

The FOMC's adoption of the funds rate as its policy instrument changed the relationship between the funds rate and *all* Treasury rates. The effect of a change in the funds rate target is larger on shorter-term rates than on longer-term rates. Consequently, the shift to targeting the funds rate also affected the relationships *among* Treasury rates. This can be seen in many ways. For example, Figure 6 shows the federal funds rate and the 20-, 10-, and 5-year Treasury yields from March 1983 to March 2007 (the vertical line denotes May 1988). The three yields move closely together as they rise and fall until the late 1980s. Thereafter, not only are the spreads larger on

FIGURE 6
20-, 10-, AND 5-YEAR TREASURY YIELDS



average, but they also widen when the funds rate declines and narrow when the funds rate rises.

The effect of this change on the spread between the 5- and 10-year Treasury yields from July 1954 to September 2016 is shown in Figure 7 (the vertical line denotes May 1988). The spread fluctuated around zero until the late 1980s and averaged just 11 basis points up to May 1988. In contrast, the spread was much larger after May 1988. It averaged 55 basis points, and was seldom negative. It reached 100 basis points or more on some occasions. Note that the spread became particularly large during the three periods when the funds rate was reduced to atypically low levels. Consequently, it seems the FOMC's low interest rate policy caused the 5-year yield to be lower than it would have been otherwise. Though not shown here, the spread between the 20- and 10-year Treasury rates changed similarly, so the policy also depressed the 10-year yield relative to what it would have otherwise been.

Figure 8 shows the spread between the 1-year Treasury rate and the 3-month T-bill rate. The spread narrowed after the late 1980s, reflecting the fact that shorter-term rates were more affected by

FIGURE 7
FEDERAL FUNDS RATE AND THE 10-YEAR/5-YEAR SPREAD

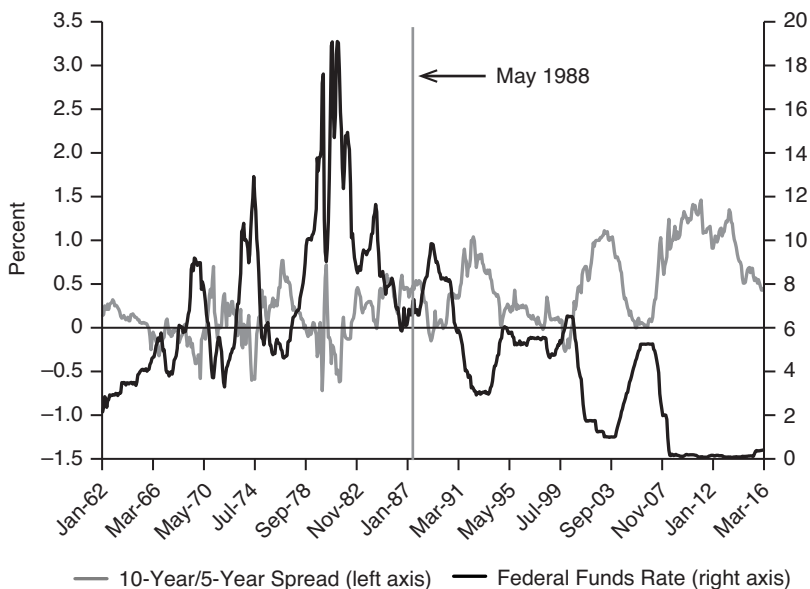
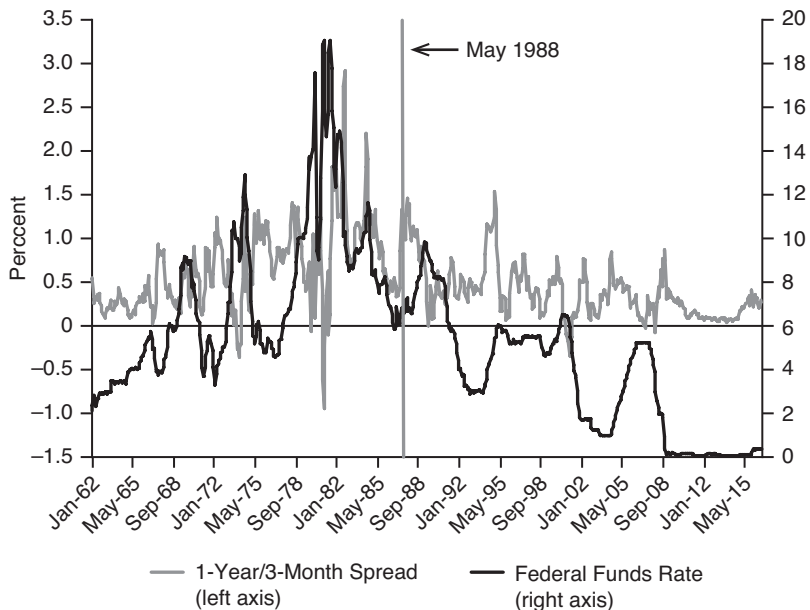


FIGURE 8
FEDERAL FUNDS RATE AND THE 1-YEAR/3-MONTH SPREAD



changes in the funds rate than longer-term rates. The spread has been particularly low since the FOMC began its low interest rate policy. The spread between the funds rate and the 3-month T-bill rate behaves similarly.

Of course, inflation and output growth were considerably more stable in the 1990s and 2000s than they had been previously. Hence, some might argue that the smaller spread was due to these factors, and not the FOMC's use of the funds rate as a policy instrument. If that were the case, however, the effect on long-term and short-term rate spreads should have been similar. That it was not suggests that shifting patterns of growth and inflation cannot explain the change in the behavior of short-term rates.

In my view, the FOMC's use of the funds rate as a policy instrument caused interest rates along the yield curve to be pulled by opposing forces after the late 1980s. Market fundamentals were pulling longer-term yields in the direction of those fundamentals, while the FOMC's funds rate policy was pulling rates in the opposite direction. Figure 7 shows that, when the FOMC funds rate was more or less in line with economic fundamentals, long-term spreads were lower and at levels more consistent with those of the prior period. Shorter-term spreads, however, continued to be more heavily influenced by the behavior of the funds rate.

This explains why I am certain that the FOMC's low interest rate policy has caused interest rates across the yield curve to be lower than they otherwise would have been. I will now turn to discussing the practical consequences of that policy.

Distorting the Allocation of Resources

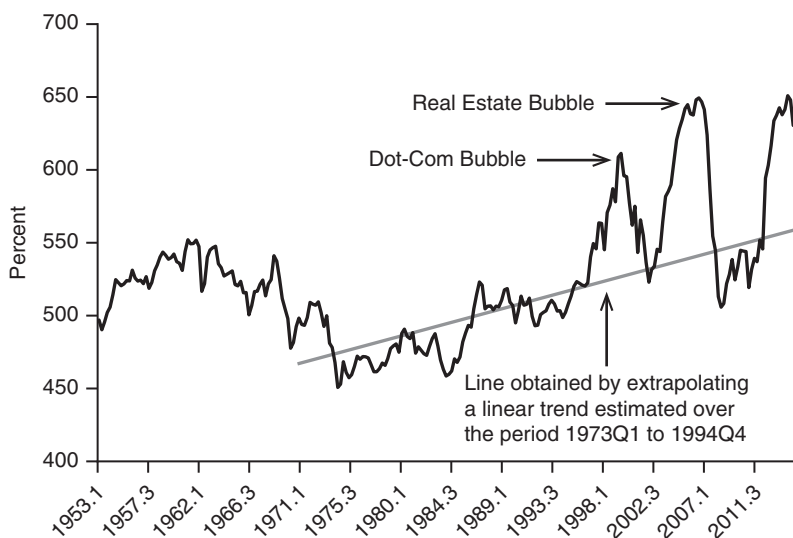
The FOMC's low interest rate policy has distorted bond yields. Consequently, it has also distorted the allocation of real economic resources. This, of course, was the FOMC's intention. The problem is myopia: the FOMC could see only good things happening—that is, that lower rates would increase spending, output, and employment. But this is not what actually occurred, and for good reasons.

For one thing, economists have known for some time that consumer and business spending is not very interest rate-sensitive. Indeed, as Bernanke and Gertler (1995) noted in their highly cited “Black Box” article, there is little reason to believe that low interest rates should have much effect on spending. Moreover, what effect lower interest rates do have on spending should be particularly weak

during financial crises and recessions, when investment prospects are poor, and flights to safety are widespread. This is truer still for the 2007–09 recession, which was accompanied by a tremendous overhang of residential real estate and associated infrastructure—roads, utilities, and so on.

The distortions brought about by atypically low interest rates are difficult to know and, hence, impossible to predict. However, it is clear that the FOMC’s policy has inflated equity and real estate prices. That these prices are inflated is reflected in Figure 9, which I call “my scary graph.” The figure shows household net worth as a percentage of personal disposable income since the first quarter of 1952. Household net worth increased gradually from 1974 to the mid-1990s, but then increased by nearly 120 percentage points between the fourth quarter of 1994 and the first quarter of 2000. This increase was fueled by a dramatic rise in equity prices spawned by easy credit and an unbridled—and in some instances unwarranted—optimism about technology. The dot-com bubble burst in the first quarter of 2000 and household net worth went with it.

FIGURE 9
HOUSEHOLD NET WORTH AS A PERCENTAGE OF
DISPOSABLE INCOME



Household net worth began increasing again in early 2003 and reached an even higher peak in the fourth quarter of 2006. This rise was fueled by aggressive monetary policy, lax lending standards, ill-conceived and ill-advised government policy, and the misguided belief that house prices could not fall nationally. The Fed kept the funds rate target at the then historically low level of 1 percent from June 2003 to June 2004, and subsequently increased it slowly at what the FOMC called a “measured pace.” Household wealth increased dramatically as house prices rose, only to collapse as house prices fell.

Household wealth has risen again above its previous peak. This latest increase is fueled by equity prices and house prices—not by real assets. I don’t see any way that household wealth can increase much further. Indeed, I find it hard to believe that it can stay at its current, inflated level. The question is: Will household wealth fall precipitously, as it did on the previous two occasions, or will it decline slowly over time? I believe the FOMC’s aggressive low interest rate policy has set the economy up for another financial crisis and recession. What remains unknown is the triggering mechanism.

The Fed’s low interest rate policy has also caused excessive risk taking. Pension funds were affected in two ways. First, the Fed’s purchase of over \$2 trillion in long-term Treasuries deprived pension funds of over \$2 trillion of safe assets. When the FOMC announced it would purchase an additional \$600 billion in long-term Treasuries, I told my colleagues at the St. Louis Fed that the FOMC should call this the “make-pension-funds-take-more-risk” policy. Second, the FOMC’s persistent low interest rate policy caused longer-term yields to be lower than they would have been otherwise, which also forced pension funds to hold more risky portfolios.³

The Fed’s low interest rate policy has penalized savers, inflated the prices of existing assets, but generated relatively little new capital. Retirees and others on fixed incomes have been hit particularly hard. They face two bad choices: live on substantially less or invest in significantly more risky assets.

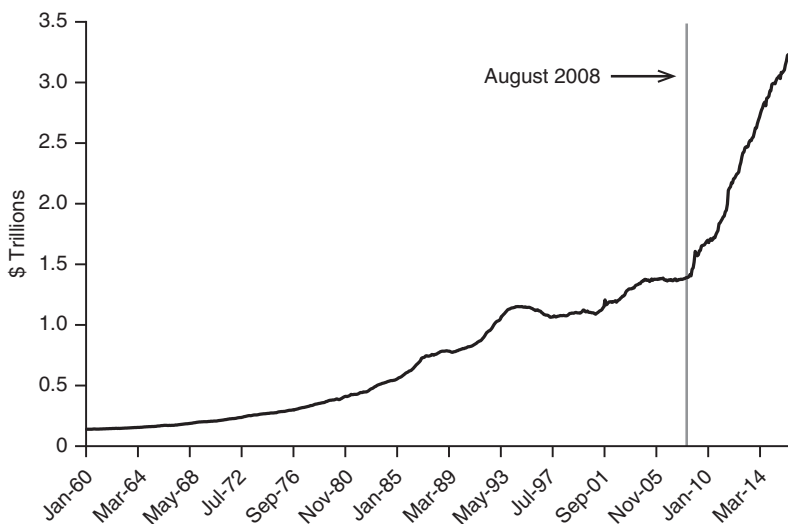
It is interesting that an impending disaster caused by the FOMC’s QE policy has gone essentially unnoticed. The FOMC’s QE policy has produced a massive increase in the money supply. This is illustrated

³For other negative effects of the FOMC’s policy, see Dowd and Hutchison (2017).

in Figure 10, which shows the M1 money measure from January 1960 to September 2016 (the vertical line denotes September 2008). There has been a massive increase in reserves. The increase was initially fueled by the Fed’s lending following Lehman’s announcement, but ballooned with the FOMC’s QE program. The Fed’s lending increased total reserves by \$775.1 billion from August to December 2008. Bank lending during this period caused total checkable deposits to increase by \$162.4 billion—a 26 percent increase in just four months. The reason, of course, is that banks were no longer financing their lending with large certificates of deposit and other loans, as they did when excess reserves were only about \$2 billion. Instead, banks were financing their loans with reserves supplied by the Fed. If banks had transformed the additional \$775.1 billion in reserves into required reserves, they would have had to make at least \$9.3 trillion in news loans or investment. Try as they might, banks just couldn’t make that many loans. Consequently, most of the new reserves (\$765.4 billion) accumulated as excess reserves.

The FOMC’s QE program exacerbated this problem. The Emergency Economic Stabilization Act of 2008, passed on

FIGURE 10
M1 JANUARY 1960–SEPTEMBER 2016
(TRILLIONS OF DOLLARS)



October 3, 2008, allowed the Fed to pay interest on excess reserve balances (IOER). The IOER rate was 25 basis points until December 16, 2015, when it was increased to 50 basis points. It was thought that IOER would cause banks to hold excess reserves rather than make loans and investments, and thus prevent a large expansion of the money supply. However, required reserves have nearly quadrupled since Lehman's bankruptcy announcement, increasing from \$43.9 billion in August 2008 to \$166.6 billion in October 2016. This increase has been associated with a massive increase in total checkable deposits and, hence, M1. Figure 10 shows that M1 has increased more since August 2008 than it did in the previous 48 years, rising from \$1.4 trillion to \$3.3 trillion. Yet banks still hold nearly \$2 trillion in excess reserves. The ratio of checkable deposits to required reserves has averaged 11.5 since January 2015. Banks would have to make an additional \$23 trillion in loans to return excess reserves to the pre-Lehman level of about \$2 billion—an impossible task!

The conventional wisdom that banks are voluntarily holding excess reserves is nonsense. Banks have an incentive to make any loan or investment with an expected risk-adjusted rate of return that is higher than the IOER. Hence, banks have made riskier loans than they would have made otherwise. They will continue to do this as long as the risk-adjusted return on loans is higher than the IOER. Of course, the FOMC could raise the IOER to a level sufficiently high to quell banks' incentive to make risky loans.⁴ But this seems improbable, because the rates on loans and investments increase with the IOER—and it's unlikely the dog will manage to catch its tail. It is more likely that banks will instead continue making risky loans and the money supply will continue to increase at a rapid pace.

Bernanke (2016), Cochrane (2014), and others have suggested that the Fed can operate indefinitely with a large balance sheet. Specifically, Bernanke notes that “with the enormous quantity of reserves now available . . . small changes in the supply of reserves no longer suffice to control the funds rate,” erroneously inferring that the Fed historically controlled the funds rate through open market operations.⁵ He suggests some “pros” and “cons” for

⁴However, Selgin (2016) has noted this would be illegal.

⁵See Thornton (2014c), in which I show why the Fed cannot in reality control the federal funds rate with open market operations. See also Friedman (1999).

having a permanently large balance sheet, but ignores the effect on the money supply and its likely drastic consequences. The Fed could operate this way if it set reserve requirements at 100 percent, but this would require the Federal Reserve Act be amended, which is unlikely.

Some might say: “Who cares about M1? Goods and services inflation is well-contained.” Well, yes—but for how long? So far inflation has shown up primarily in equity and home prices. But I believe that, if the rapid pace of money growth—11 percent for the past eight years—continues (which it assuredly will unless the FOMC begins normalizing its balance sheet very soon), this money will eventually be reflected in consumer prices as well. If that does happen, QE will have created an inflation disaster.

Why a disaster? First, the Fed has historically been slow to respond to increased inflation pressures. I suspect this time will be no different. Indeed, several members of the FOMC have suggested they would be comfortable with inflation somewhat in excess of the FOMC’s 2 percent target. Second, the FOMC will find it nearly impossible to shrink the balance sheet fast enough to avoid further increases in M1. Third, there is no hope that the FOMC would reduce M1 to avoid the impending inflation disaster. The only way this could be done is by a marked increase in reserve requirements. This too seems highly unlikely. In any event, by the time the FOMC got around to implementing such a policy, the inflation-expectations cat would be out of the bag.

When Did the Credit Trap Begin?

I am inclined to believe that the horrendous monetary policy the FOMC has pursued since the financial crisis is a reflection of a broader societal problem. It seems to me that society has steadily increased its reliance on credit over the last 50 years. The increased reliance on credit is reflected in a variety of ways—not only in the FOMC’s monetary policy. For example, debt-reliance is reflected in the fact that the federal government has run a persistent budget deficit since at least 1970. Prior to 1970, budget deficits in some years were partially, or in some cases fully, offset by surpluses in subsequent years. Since then, deficits have been large by historical standards, and more often than not have

increased as a percentage of GDP. There have been only four surplus years (1998–2001) since 1970. The public debt is now 52 times larger than it was then, while GDP is only 17 times larger. Hence, the federal debt, which was 35 percent of GDP in 1970, is now 105 percent of GDP.

The increased reliance on credit is also reflected in the willingness of federal, state, and local governments to take on ever-larger unfunded liabilities. The federal government's pension funds and other promises (e.g., Social Security, Medicare, and Medicaid) are grossly unfunded, and most state and local pensions are woefully underfunded—by some estimates as much as \$3 trillion short of what is needed.

Credit-reliance is also reflected in financial innovations such as collateralized debt obligations, securitization, and credit default swaps. Collateralized debt obligations compound rather than reduce risk. Securitization and credit default swaps distance the lender from the assets that secure the loans. The result is a tendency to create more promises than there are real assets to back them. As a consequence, asset prices rise above their long-run value. I don't believe the house price bubble could have occurred if most real estate loans were made and held locally.

It is hard to know exactly the cause of this credit trap. Indeed, it is likely that there are a number of contributing factors. But I believe the widespread adoption of Keynesian economics is an important one. Credit is the hallmark of Keynesian economics: if the economy is growing too slowly, the response is to borrow more and spend more. Deficit spending—whether public or private—is seen as the cure for all ills. Meanwhile, the belief that saving is essential for investment and economic growth has more or less vanished from economic discussion. When the economy is not performing to expectations, the cure is always more credit, more spending, and less saving. The FOMC's response to the financial crisis, and its policies since, are part and parcel of this approach to economic management.

Conclusion

After the Volker Fed brought an end to the Great Inflation, the FOMC once again began equating the stance of monetary policy

with the level of the federal funds rate. The FOMC didn't want to be seen as returning to a failed practice, so it said it was using a borrowed reserves operating procedure (see Thornton 2001, 2006). The FOMC's reliance on the funds rate as an indicator of the stance of monetary policy came to a head in the late 1980s when the FOMC adopted the funds rate as its policy instrument shortly after Greenspan became chairman. Greenspan later described the metamorphosis as follows:

As you may recall, we fought off that apparently inevitable day as long as we could. We ran into the situation, as you may remember, when the money supply, nonborrowed reserves, and various other non-interest-rate measures on which the Committee had focused had in turn fallen by the wayside. We were left with interest rates because we had no alternative. I think it is still in a sense our official policy that if we can find a way back to where we are able to target the money supply or net borrowed reserves or some other non-interest measure instead of the federal funds rate, we would like to do that. I am not sure we will be able to return to such a regime . . . but the reason is not that we enthusiastically embrace targeting the federal funds rate. We did it as an unfortunate fallback when we had no other options [Board of Governors 1997: 80–81].

Yet the adoption of the funds rate as the policy instrument was not *only* due to the lack of a relationship between money and reserve aggregates, on the one hand, and things policymakers care about on the other. In fact, it was driven in large part by a theoretical model of the economy in which money and reserves do not exist in any meaningful way, or are at best implicit (see McCallum 2008 and Woodford 2008). In the New Keynesian model, monetary policy works exclusively through the interest rate channel. It is a tragedy that this school of thought is so dominant because—as I have noted elsewhere (Thornton 2014a)—the best monetary policy antidote for a financial crisis is a massive but temporary increase in credit, brought about by the expansion of the monetary base. In contrast, the Fed's preferred alternative, a persistent-verging-on-permanent low interest rate policy, is nothing more than a recipe for disaster.

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