The Lower and Upper Bounds of the Federal Open Market Committee's Long-Run Inflation Objective

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It is widely acknowledged that the Fed can control the average inflation rate over a period of time reasonably well. Because of this and the Federal Open Market Committee's (FOMC's) long-standing commitment to price stability, the author argues that the FOMC has an implicit long-run inflation objective (LIO)—lower and upper bounds to the long-run inflation rate. He shows that the statements made by the FOMC in 2003 clarified the lower bound of its LIO and that the average of long-run inflation expectations responded by rising about 80 basis points. Moreover, consistent with reducing the market's uncertainty about the FOMC's LIO, long-run inflation expectations became more stable. The FOMC has recently been more specific about the upper bound of its LIO as well. The FOMC could eliminate the remaining uncertainty by establishing an explicit, numerical inflation objective. (JEL E50, E52, E58)

Federal Reserve Bank of St. Louis *Review*, May/June 2007, *89*(3), pp. 183-93.

Currently there are at least 21 countries with inflation targets.[1] Inflation targeting is marked by a numeric inflation objective that the central bank attempts to achieve over a reasonably well-specified time horizon. The numeric target is most often a range in which inflation is permitted to vary over a multiyear horizon. Among the industrialized nations of the world, the central banks of the United States and Japan stand out in not adopting a formal, numeric inflation target.

Economists and policymakers have raised a number of objections to establishing an explicit numeric inflation target in the United States. The most important of these objections are discussed in Federal Reserve Bank of St. Louis (2004) and, hence, will not be discussed here. When he was a Federal Reserve System Governor, Bernanke (2004) suggested that the Fed take an "incremental move toward inflation targeting, in the form of the announcement of a long-run inflation objective"[2] (LIO), which I take to be congruent with Bernanke's optimal long-run inflation rate, which he defined as "the long-run (or steady-state) inflation rate that achieves the best average economic performance over time with respect to *both* the inflation and output objectives."[3] I argue that (i) the Federal Open Market Committee (FOMC) already has what can be reasonably characterized as an implicit LIO and (ii) having an implicit LIO is a consequence of the conventional wisdom that the Fed (indeed, all central banks) can control the long-run inflation rate. I present evidence

[1] See Rasche and Williams (2005) for a list of these countries and the details of their inflation targets.

[2] Bernanke (2004, p. 165).

[3] Bernanke (2004, p. 166).

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that the market believes that the FOMC has an implicit LIO by showing the market's reaction to statements made by the FOMC in 2003.

The adoption of inflation targeting by many of the world's central banks is directly linked to changing views about the central bank's ability to control inflation. The now conventional wisdom that the Fed and other central banks control long-run or steady-state inflation is the primary reason central banks have an explicit or implicit LIO. Hence, the paper begins with a brief review of the evolution of thinking about the ability of central banks to control inflation during the nearly 100 years of the Federal Reserve System.

CENTRAL BANKS AND INFLATION

Although it is now widely believed that the FOMC has an implicit LIO, this has not always been the case. Indeed, there has been an ebb and flow in economists' and policymakers' thinking about the ability of the central bank to control inflation over the near 100 years of the Federal Reserve System. The quantity theory of money was the dominant theoretical paradigm in the economics profession at the time of the Fed's founding. The quantity theory was embodied in the gold standard, where long-run price stability was maintained through an automatic equilibrating process known as the price-specie-flow mechanism. In essence, the quantity theory asserts a strong causal link between money growth and inflation. In fiat monetary systems, where the currency is not backed by gold or other precious metals, the quantity theory asserts that central banks control inflation by controlling the rate of growth of the money supply. Permitting the money supply to grow more rapidly than is warranted by labor force and productivity growth causes inflation. Too slow money growth results in deflation. The quantity theory hypothesizes that inflation *is always and everywhere a monetary phenomenon* that central banks can control.

The early Fed was skeptical of the quantity theory and followed what is called the *real bills doctrine*. The real bills doctrine hypothesized that reserves supplied by the Fed for "productive purposes"—to enhance the production of goods and services—would not be inflationary.

Economists' thinking about what central banks could and could not do about inflation changed markedly following the publication of Keynes's *The General Theory of Employment, Interest and Money* in 1936 and the subsequent Keynesian Revolution. For various reasons, perhaps the most important of which were concerns that the central banks had limited ability to control the supply of money and the belief that the demand for money was not stable, economists and policymakers came to question central banks' ability to control (or even substantially influence) inflation. The conventional wisdom was that inflation was not the consequence of an excess supply of money, but of an excess of aggregate demand—the demand for all goods and services—which could occur independent of the relative supply of money.[4] Moreover, it was believed that monetary policy had relatively little impact on aggregate demand.[5] A small effect on aggregate demand translates into a small effect on inflation. Consequently, it was thought that the Fed could do relatively little to control inflation.

A high point of the belief that inflation is not a monetary phenomenon in the United States occurred in 1974 with the federal government's WIN (Whip Inflation Now) campaign. The WIN campaign was an attempt to spur a grassroots movement to reduce inflation through a combination of public and private measures to reduce aggregate demand and, consequently, "demand-pull" inflation. Fiscal policy, increased saving, and other factors—not monetary policy—were thought to be the keys to curing the nation's inflation woes.[6]

The monetarist counterrevolution and the success with anti-inflation monetary policy in

[4] See Nelson (2005a,b) and Nelson and Nikolov (2004) for a discussion of how neglect of monetary factors and belief that other factors caused inflation played a role in several of the great inflations of the 1970s.

[5] See Bernanke (1993) for an excellent and concise discussion of some of these arguments.

[6] On this note it is interesting to observe that inflation has been trending lower despite a corresponding negative trend in the United States saving rate.

the late 1970s and early 1980s dramatically changed economists' and policymakers' thinking about what central banks could do about inflation.[7] Despite the fact that the Fed and nearly all other central banks now use a short-term nominal interest rate instrument and not monetary aggregates to conduct policy, it is widely acknowledged that central banks can control inflation on average over a period of time.[8]

If central banks can control the average long-run inflation rate, it follows that they are responsible for it, whether they, or the governmental agencies to whom they report, establish a specific numerical objective for it or not or whether, by their actions, they effectively abdicate their responsibility: The Fed was responsible for the great inflation of the 1970s, even though it was not intended. For most central banks, the realization that they control the long-run inflation rate has led to the adoption of formal inflation objectives or inflation targets. Although it has never adopted a specific inflation target, the Fed has had a long-standing objective of "price stability." Former Chairman Greenspan repeatedly noted that the primary role of monetary policy is to promote sustainable economic growth over time by fostering price stability.[9] Chairman Bernanke has reiterated the causal link between price stability and economic growth, noting that "price stability is essential for strong and stable growth of output and employment."[10] Given the belief that the Fed can control the long-run inflation rate and its stated objective of price stability, it follows that the FOMC has an implicit LIO.[11] That is, the FOMC has an implicit range of inflation that is consistent with its objective of "price stability."

Despite his repeated assertion that sustainable economic growth is inexorably linked to price stability, former Chairman Greenspan opposed adopting a specific numerical LIO on the grounds that no price index adequately reflected price stability and because of political concerns (Greenspan, 2002; FOMC, 1995). In contrast, Chairman Bernanke has been a steadfast proponent of inflation targeting (e.g., Bernanke, 2002, 2003, 2004). Several other FOMC participants also have expressed a preference for announcing an explicit LIO recently (e.g., Poole, 2006; Lacker, 2005; Stern, 2005; and Yellen, 2006).

DOES THE MARKET BELIEVE THE FOMC HAS A LIO?

Given the belief that the Fed is responsible for the average long-run inflation rate and the FOMC's commitment to price stability, it is reasonable to assume that market participants have a perception of the FOMC's implicit LIO. For example, it is doubtful that anyone believes that the FOMC would be content with long-run inflation of 5 percent or with persistent and protracted deflation. Hence, it seems safe to assert that most market analysts believe that the FOMC's implicit LIO is somewhere between zero and, say, a maximum of 5 percent. Of course, some may believe the implicit target to be narrower. Assuming that market participants expect the FOMC to behave consistently with its implicit LIO, the average of these expectations provides a point estimate of the FOMC's implicit LIO.

The only market-based measure of inflation expectations is the spread between Treasury inflation-indexed securities (TIIS) and the corresponding non-indexed Treasury issue. TIIS are indexed to inflation as measured by the consumer price index (CPI). Nominal long-term bond yields reflect both the market's expectation for the real yield and expectations for inflation, whereas the corresponding TIIS reflects only the real yield; accordingly, the TIIS spread—the difference between the nominal yield and the corresponding TIIS yield—is, in principle, a measure of the market's expectation of inflation over the holding period of the long-term asset. The spread is not a pure measure of inflation expectations because

[7] See Federal Reserve Bank of St. Louis (2005) for a detailed discussion and analysis of this period in U.S. monetary policy.

[8] See Bernanke (2003) for a discussion of the role of money and monetary aggregates in the inflation process.

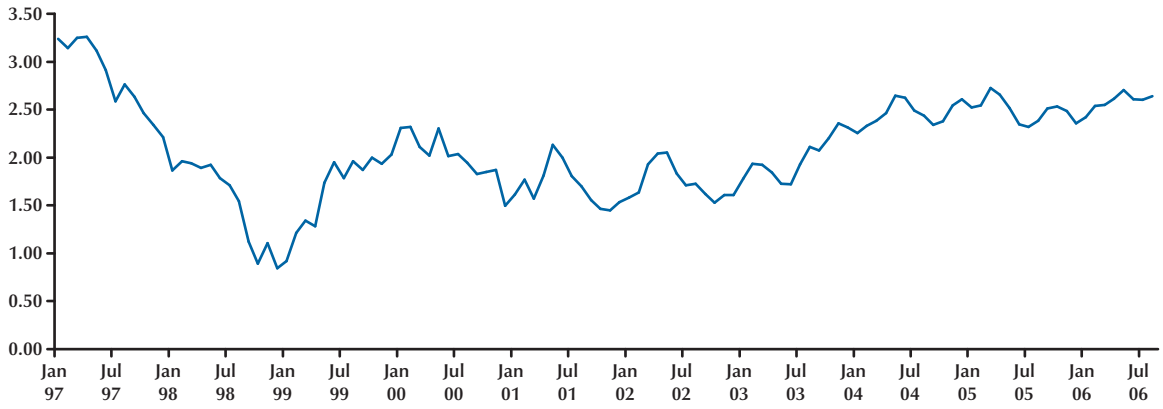
[9] See Rasche and Thornton (2006) for more details.

[10] Bernanke (2006).

[11] For example, Yellen (2005) notes that "inflation…is what the Fed can undeniably control in the long run."

Figure 1

10-Year TIIS Spread (monthly average)



the spread also may reflect risk and liquidity premiums.[12] That is, the spread is equal to

$$TIIS_t^{sp} = \pi^e + rp - lp,$$

where $TIIS_t^{sp}$ denotes the spread between nominal and inflation-indexed Treasury securities, π^e denotes expected inflation, rp denotes the inflation risk premium, and lp denotes the liquidity premium.

The possibility of a non-zero inflation risk premium arises from the fact that investors in nominal debt are uncertain about the inflation rate that will occur over the holding period of the assets. This is due in part to uncertainty about the FOMC's LIO. Of course, no one expects the FOMC to achieve its LIO exactly at each point in time. Consequently, the inflation risk premium might exist because of stochastic variation in inflation around a known LIO. Either way, the greater the uncertainty, the more investors will have to be compensated—the larger the risk premium—assuming that investors are risk averse.[13]

The liquidity premium stems from the fact that the market for TIIS is less liquid than the market for nominal Treasury securities. Consequently, TIIS investors likely receive a liquidity premium in the form of a higher return for holding TIIS rather than more-liquid conventional securities.

The risk and liquidity premiums have opposing effects on the spread as a measure of inflation expectations. The existence of a risk premium causes $TIIS_t^{sp}$ to overestimate the market's expectation for inflation. The existence of a liquidity premium causes $TIIS_t^{sp}$ to underestimate inflation expectations. Consequently, $TIIS_t^{sp}$ only approximates CPI inflation expectations. Nevertheless, if one is willing to assume that the sum of these premiums is relatively stable over time, marked changes in the TIIS spread should reflect changes in market participants' expectations of inflation.

Inflation-indexed securities were first issued in January 1997. Figure 1 presents the monthly *on-the-run* $TIIS_t^{sp}$ for 10-year government securities since January 1997.[14] $TIIS_t^{sp}$ fluctuated considerably during the early years of the market

[12] Also, it is impossible to match the maturities of TIIS and nominal government securities exactly. Even if the maturities were an exact match, the two securities have different payment flows. See Sack and Elsasser (2004) and Kwan (2005) for additional details.

[13] Even if investors were risk neutral, the risk premium would not vanish for technical reasons; see Sack (2000) and Sack and Elsasser (2004) for details.

[14] On-the-run securities are the most recent issue. The on-the-run spread reported here is obtained by subtracting the yield on the most recently issued TIIS from the constant maturity yield on the most recently issued nominal Treasury security that most closely matches the maturity of the on-the-run TIIS.

but settled down by early 2001. From January 2001 to June 2003, $TIIS_t^{sp}$ averaged 1.72 percent. In the summer of 2003 the spread began to widen, but by January 2004 it appeared to have settled down again. From January 2004 to March 2006, the spread averaged 2.49 percent, 77 basis points higher than from January 2001 to June 2003. What is responsible for the widening of the spread?

The 2003 Experience

At the conclusion of the May 2003 meeting, the FOMC stated in its press release that "the probability of an unwelcome substantial fall in inflation, though minor, exceeds that of a pickup in inflation from its already low level." This statement was widely analyzed in the press as suggesting the possibility that inflation was at the "lower bound" of the rate acceptable to the Committee. This interpretation was reinforced by the release of the minutes of the May meeting on June 25 and by the FOMC's June 2003 press release. The minutes indicated that "substantial additional disinflation would be unwelcome because of the likely negative effects on economic activity and the functioning of financial institutions and markets, and the increased difficulty of conducting an effective monetary policy, at least potentially in the event the economy was subjected to adverse shocks."[15] Members agreed, however, that "there was only a remote possibility that the process of disinflation would cumulate to the point of a decline for an extended period in the general price level."[16] The June press release contained a statement identical to the May statement, but went on to indicate that, "On balance, the Committee believes that the latter concern [an unwelcome fall in inflation] is likely to predominate for the foreseeable future."

Then-Governor Bernanke detailed his views in a speech entitled "An Unwelcome Fall in Inflation?" on July 23, 2003. Noting that "the May 6 statement was more than a procedural innovation," Bernanke suggested that it "broke new ground as the first occasion in which the FOMC expressed the concern that inflation might actually fall too low."[17] Bernanke's suggestion that the FOMC had a non-zero lower bound beyond which it did not want inflation to fall was made clear in the FOMC's August 12 statement, which read, "The Committee judges that, on balance, the *risk of inflation becoming undesirably low* is likely to be the predominant concern for the foreseeable future" (emphasis added). This statement was repeated in the September 16 and October 28 statements.

That the 2003 experience effectively established a lower bound for the FOMC's LIO is also suggested by Jeffrey Lacker, president of the Federal Reserve Bank of Richmond, who was the Director of Research at the Richmond Fed in 2003. Lacker (2005, p. 6) notes that

> The statement issued following the May 2003 FOMC meeting asserted that a fall in inflation—then about 1 percent—would be "unwelcome." This came as something of a surprise to markets and caused a sharp reaction in long-term rates. If an inflation target range had been in place in 2003 with a lower bound of 1 percent, the public could have inferred the Fed's growing concern about disinflation as the inflation rate drifted down toward that bound... If the May 2003 statement is interpreted as the revelation of the lower bound of an inflation target range, then half of an inflation target range has been announced. And if revealing a dislike of inflation below 1 percent was useful in May 2003, is it not likely that revealing an upper bound will prove useful in some future circumstance?

The FOMC's concern about disinflation began to abate in the fall of 2003. At the conclusion of the December meeting the FOMC indicated that "the probability of an unwelcome fall in inflation has diminished in recent months and now appears almost equal to that of a rise in inflation." Refer-

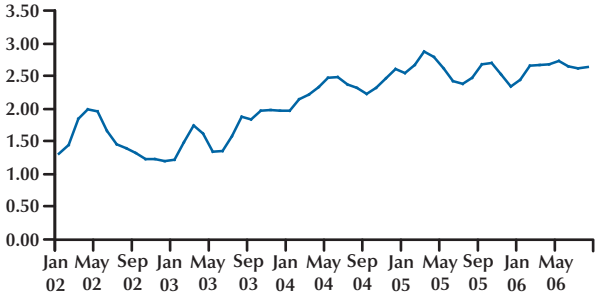
[15] Minutes of the Federal Open Market Committee, May 2003. The last concern is reference to the so-called *zero bound problem*. The zero bound problem arises because zero is the theoretical lower bound to nominal interest rates. Because the policy instrument is the nominal federal funds rate, the zero bound on nominal interest rates is thought by some to set a lower bound to the FOMC's ability to conduct expansionary monetary policy. For a more detailed discussion of the zero bound problem, see Bernanke (2002).

[16] Minutes of the Federal Open Market Committee, May 2003.

[17] Bernanke (2003).

Figure 2

5-Year TIIS Spread (monthly average)



ence to an unwelcome fall in inflation was not mentioned in subsequent statements.

The Effect of the 2003 Experience on Market Participants' Beliefs about the FOMC's LIO

Market participants formulate their beliefs about the FOMC's implicit LIO from verbatim FOMC transcripts, minutes of FOMC meetings, press releases made at the conclusion of each FOMC meeting, speeches and other statements made by the Chairman and other FOMC participants, and FOMC policy actions. It is not surprising that there was a sharp change in the TIIS spread following the FOMC's revelations concerning the lower bound of its implicit inflation objective.

If the observed rise in the 10-year TIIS spread were due to the market having better information about the FOMC's LIO, we might anticipate that expectations would be revised at a horizon that might reasonably be thought of as the horizon consistent with the FOMC's LIO. Consequently, $TIIS_t^{sp}$ is also calculated for the 5-year horizon. Figure 2 presents $TIIS_t^{sp}$ using the 5-year TIIS beginning in October 2004 and the previous 10-year issues that are closest to having a 5-year-remaining term for the previous period. Because the first 10-year TIIS was first issued in 1997, the sample period is January 2001 through August 2006. The behavior of the 5-year $TIIS_t^{sp}$ after the 2003 experience was similar to that of the 10-year $TIIS_t^{sp}$. Specifically, the average 5-year $TIIS_t^{sp}$ increased by about 100 basis points, from 1.46 percent for the period January 2002 through June 2003 to 2.48 percent for the period January 2004 through April 2006.

If the marked rise in long-run inflation expectations shown in Figures 1 and 2 is due to the FOMC eliminating some uncertainty about the lower bound of its long-run inflation objective, we might also expect to see a reduction in the variability of the TIIS spread. That this occurred is verified in Figure 3, which shows the intra-month standard deviation of the 10-year (solid line) and 5-year (dashed line) TIIS spreads using daily data. Despite the fact that the average level rose, consistent with long-run inflation expectations being more precisely held, there is a marked drop in the intra-month standard deviation in early 2004 for both the 5-year and 10-year TIIS spreads. For the 10-year $TIIS_t^{sp}$, the standard deviation declined from 7 basis points from January 2001 through June 2003 to 5 basis points from January 2004 though August 2006. For the 5-year $TIIS_t^{sp}$, the standard deviation dropped by a third, from 9 basis points for the period January 2002 through June 2003 to 6 basis points from January 2004 though August 2006.

Survey Measures of Long-Run Inflation

The Blue Chip and Michigan survey also poll their survey participants for inflation forecasts over longer-run horizons. The Blue Chip survey is biannual, while the Michigan survey is monthly. The Michigan survey asks respondents what they believe will be the average CPI inflation rate over the next 5 to 10 years, whereas the Blue Chip forecasts are for 5-year and 10-year horizons. The monthly average of the mean forecast of Michigan survey for the period 1997-2006 are presented in Figure 4. The qualitative implications from the Blue Chip survey are identical, so only the Michigan survey is presented here. Survey expectations drifted down slightly from early 1997 to early 2001; however, unlike $TIIS_t^{sp}$ there is no marked change in the survey forecasts of the long-term inflation rate after mid-2003. Survey forecasts for long-run inflation averaged 3.3 percent for both the period January 2001 through June

Figure 3

Intra-Month Standard Deviation of the 5- and 10-Year TIIS Spreads

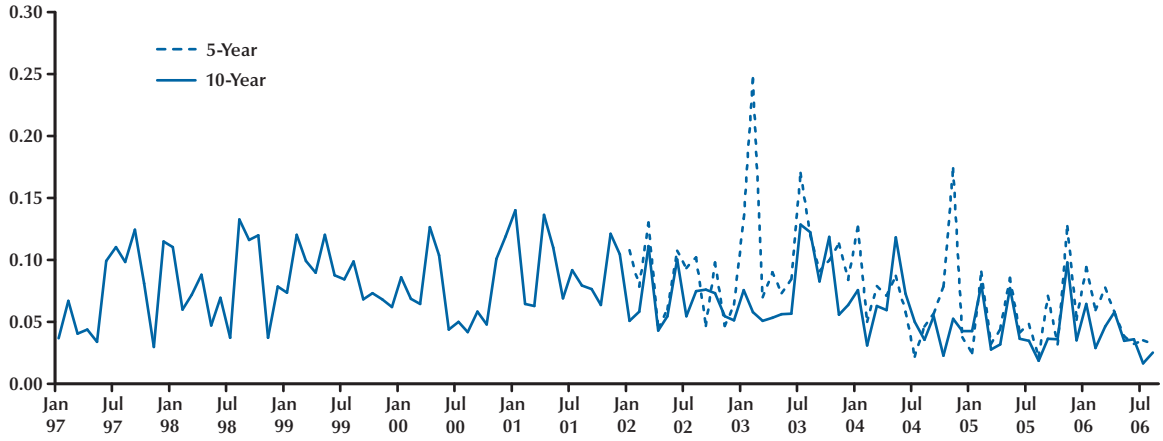
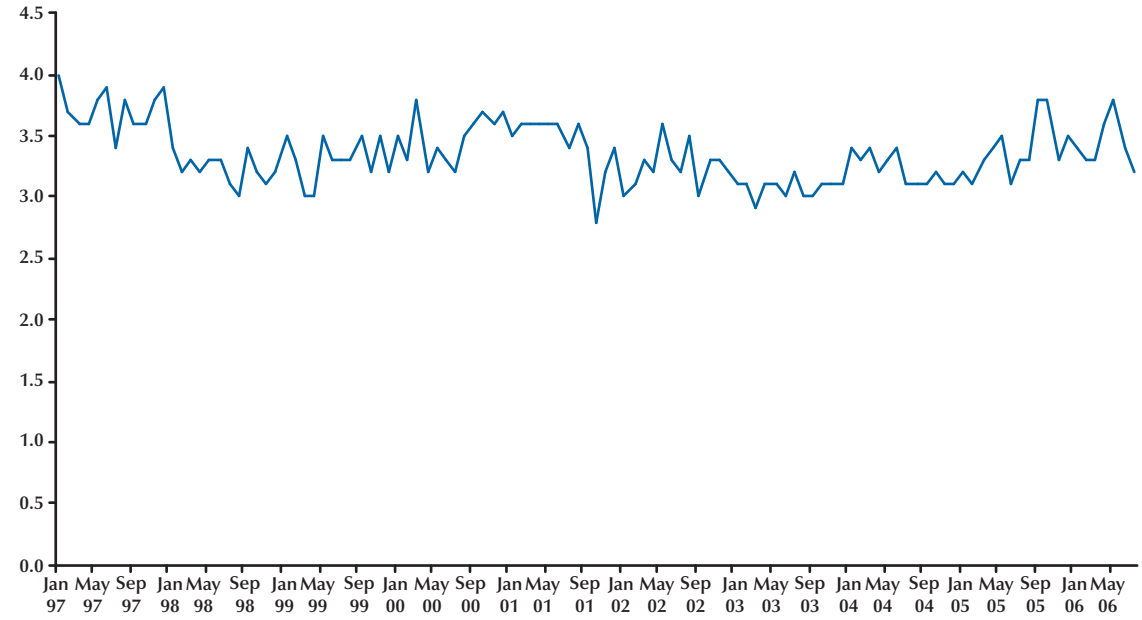


Figure 4

The Survey of Inflation Over the Next 5 to 10 Years



2003 and January 2004 though July 2006. Hence, the indication from $TIIS_t^{sp}$—that there was a marked change in inflation expectations in the wake of the FOMC being more explicit about its LIO—is not reflected in survey expectations measures.

The lack of response of the survey forecasts after May 2003 is difficult to reconcile with the marked and sustained increase in the TIIS inflation expectations measure. It could be that there was a marked increase in the liquidity premium in the TIIS market that just happened to coincide with the FOMC's statements. The liquidity premium between on-the-run nominal Treasuries and the less liquid on-the-run TIIS is not directly observable. However, comparisons of yields of on-the-run and off-the-run TIIS indicate that the liquidity premium for on-the-run TIIS is small and does not decline markedly in mid-2003. Estimates of the liquidity premium in the nominal Treasury market by Gurkaynak, Sack, and Wright (2006) also suggest that the liquidity premium is rather small, about 10 basis points. Hence, it is unlikely that the approximately 80-basis-point widening of the spread could be attributed solely or largely to a decline in the liquidity premium.

Alternatively, statements made at the May and subsequent meetings could have caused the inflation risk premium to rise. For example, some market participants who thought that the FOMC's inflation target range was say 0 to 2 percent may have become more uncertain about the FOMC's LIO. More generally, indications that the FOMC had a non-zero lower bound to acceptable inflation could have shaken some participants' belief about the FOMC's commitment to price stability. That the entire 80-basis-point increase can be attributed to a larger inflation risk premium seems unlikely, however.

Despite the fact that there is no corresponding rise in survey measures of inflation expectations, the fact that $TIIS_t^{sp}$ widened following the FOMC's statements and leveled off when the FOMC indicated that its concerns about disinflation had waned strongly suggests that the sharp rise in $TIIS_t^{sp}$ reflects the market's reevaluation of the FOMC's implicit LIO. One possibility is that the FOMC's statements effectively truncated the lower end of the probability distribution of inflation expectations. That is, consistent with Lacker's (2005) interpretation, individuals who may have thought the Fed's inflation objective was less than, say, about 1 percent revised their expectation upward. This explanation alone would not seem to account for the 80-basis-point rise in the spread. To see why, assume that prior to the summer of 2003 all market participants thought that the FOMC's LIO was 0 to 3 percent, with a mean of 1.5 percent (which is close to the average spread from January 2001 through June 2003). If the statements caused all market participants simply to truncate their estimate of the lower bound of the FOMC's LIO at 1 percent, this would cause the average spread to increase by only 50 basis points, from 1.5 percent to 2 percent. It is, however, difficult to assess the impact of truncation on the average level of inflation expectations because the FOMC was vague about the lower bound for inflation. Some market participants may have thought that the effective lower bound was now higher than the 1 percent rate suggested by Lacker. Nevertheless, if the nearly 80-basis-point rise in the spread is entirely due to a rise in inflation expectations among market participants, it would seem that the FOMC's statements must have caused some market participants to raise their estimate of the upper bound of the implicit LIO as well. For example, participants who previously thought the FOMC's target range was 0 to 2 percent could have raised the estimated range to 1 to 3 percent.

The Upper Bound of the FOMC's LIO

Statements made in 2003 suggest that the FOMC has a lower bound of acceptable long-run inflation in the neighborhood of 1 percent. Given its commitment to price stability, there can be no doubt that the FOMC has an upper bound as well. However, as Bernanke (2004) has noted, the publicly expressed preferences for the LIO by various members of the FOMC range "from less than 1 percent to 2.5 percent or more."[18] With the recent

[18] Bernanke (2004, p. 165).

rise in inflation, the FOMC has provided more information about the upper bound of its implicit LIO. The minutes of the August 9, 2005, FOMC meeting indicate that

> While recent monthly readings indicated that core inflation had been subdued, *a number of participants noted that underlying core inflation appeared to be running at a pace around the upper end of the range they viewed as consistent with price stability*—an assessment that was reinforced by the recent upward revisions to historical data on core PCE inflation. Participants commented that an increase in inflation from recent rates could have especially adverse effects on longer-run economic performance. (emphasis added)

A similar statement appeared in the minutes of the March 27-28, 2006, FOMC meeting, where

> *Some participants* held that core inflation and inflation expectations were already toward the upper end of the range that they viewed as consistent with price stability, making them particularly vigilant about upside risks to inflation, especially given how costly it might be to bring inflation expectations back down if they were to rise. (emphasis added)

A similar statement appeared in the minutes of the May 10, 2006, meeting.

The minutes of June 28-29, 2006, meeting are more specific in that they indicate that inflation may have already reached the Committee's upper bound. The minutes note that

> *All participants* found the elevated readings on core inflation of recent months to be of concern and, if sustained, inconsistent with the maintenance of price stability. (emphasis added)

During the three months prior to this meeting, annual core CPI inflation averaged about 3.75 percent, while core PCE inflation averaged about 3.1 percent. The lack of specificity about the core measure to which the FOMC was referring creates uncertainty about the upper bound of the FOMC's inflation objective. Nevertheless, if these numbers reflect "core inflation of recent months," the upper bound of the FOMC's LIO is somewhere in the neighborhood of 3.1 to 3.75 percent.

If one assumes that Lacker's suggestion that the 2003 experience established the lower bound of the FOMC's implicit LIO at 1 percent, one can conjecture that the FOMC's implied LIO is, say, 1 to 3.5 percent. The midpoint of this range, 2.25 percent, is very close to Chairman Bernanke's (2004, p. 166) suggestion that "something in the vicinity of 2 percent is the optimal long-run average inflation rate for a variety of assumptions about the costs of inflation, the structure of the economy, the distribution of shocks, etc." Bernanke noted, however, that many details would have to be decided before such a number could be embraced by the FOMC and suggested that additional research would be worthwhile before the FOMC could decide on the optimal long-run inflation rate. The estimate of 2.25 percent is below the TIIS spread of 2.5 percent, but the difference can easily be accounted for by a non-zero inflation risk premium.

CONCLUSIONS

Because the Fed can control the average long-run inflation rate and because of the FOMC's long-standing commitment to price stability, it is reasonable to assume that the FOMC has an implicit LIO. The 2003 experience clarified the lower bound of the FOMC's LIO. The minutes of June 2006 have clarified the FOMC's upper bound. That this recent guidance does not appear to have affected the TIIS spread significantly suggests that the information merely reinforced the market's belief in the upper bound of the FOMC's LIO. The FOMC could alleviate the remaining uncertainty by following Bernanke's (2002) suggestion and formally announcing a LIO. Until it does, the market will have to rely on FOMC statements, actions, and other information to pin it down more tightly.

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