January 16, 2015

FOMC Deliberations Prior to the Initial Tightening of Monetary Policy in 1994, 1999, and 2004[1]

This memo provides summaries of the Committee's deliberations during the six months prior to its decisions to increase the target for the federal funds rate in February 1994, June 1999, and June 2004. The narratives are based on a review of policy records for those periods, including FOMC meeting transcripts and minutes; monetary policy reports and testimony; and Bluebooks and Greenbooks. They include information on the economic and financial backdrop for each decision as well as the initial financial market reaction to the increase in the target federal funds rate.

- In 1994 and 2004, the stance of monetary policy prior to the initial tightening was highly accommodative. In contrast, the stance of policy was not particularly accommodative when the Committee initiated tightening in 1999.
- The level of inflation and the degree of slack in resource utilization at the time of tightening differed in each episode, and the Committee's specific goals for the levels of the unemployment rate and inflation consistent with its mandate evolved over time (table 1).
- The decisions to tighten were data-dependent and forward-looking. The evolution of participants' views on the outlook for real activity and inflation was central. (table 2)
- In all three periods, the Committee was concerned about waiting too long and allowing an undesirable rise in inflation, but it also considered whether the economic expansion would be sustained.
- Each time, the Committee discussions covered the likely pace of tightening, not just the timing of the first increase in the federal funds rate. In February 1994, a number of participants judged that conditions warranted an initial increase of 50 basis points but, recognizing that financial markets were not

[1] Ellen Meade, Yoshio Nozawa, Lubomir Petrasek, and Joyce Zickler; Edward Atkinson, Eric Horton, and Blake Phillips provided research assistance.

prepared for such a prompt and sizable action, the Committee opted to begin removing the high degree of policy accommodation gradually. During its deliberations in mid-1999, the Committee considered how much of 1998's 75-basis-point easing needed to be taken back and what cumulative increase would be needed to relieve pressure on labor utilization and prevent an escalation of inflation. In June 2004, participants generally agreed that they needed to move policy back to a neutral stance over time, and most judged that the "measured pace" forward guidance would allow the pace of tightening to be adjusted in response to incoming information about economic conditions and the economic outlook.

- The ways in which the Committee communicated its views on economic and financial conditions, the economic outlook, and its policy intentions evolved over time. In all three cases, the minutes and directive for each FOMC meeting were not released until two days after the subsequent meeting.
    - In 1993, there was no postmeeting statement, and changes in the funds rate target were not announced.
    - A few days prior to the first tightening in February 1994, Chairman Greenspan testified before the Joint Economic Committee with the intent of signaling that the Committee was close to liftoff. However, the tightening as well as Greenspan's announcement of the decision following the FOMC meeting were not anticipated.
    - From February 1994 until May 1999, the Committee issued postmeeting statements only when it changed the funds rate target.
    - In May 1999, a month ahead of the decision to raise the target for the federal funds rate, the Committee issued a postmeeting statement pointing to concerns about inflation and indicating that the Committee was leaning toward firming policy. Since then, statements have been released after every meeting.
    - In 2004, the Committee used a sequence of changes in statement language to signal that its assessment of the economy was evolving and that it was getting closer to raising its funds rate target.

- The Committee considered the potential reactions in financial markets and sought to avoid large policy surprises by signaling its policy intentions before acting, particularly in 1999 and 2004.
    - Given the limited tools of communication in 1994, the market reaction to the initial tightening was sizable. When the initial policy move was followed by information indicating a much stronger path for the economy than had been anticipated and by heightened concerns about inflation, interest rates moved sharply higher and volatility increased.
    - By comparison, financial markets were better prepared for liftoff in 1999 and 2004, in part because of more-successful policy communications. The initial increase in the10-year Treasury yield after the June 1999 policy firming was smaller than during the 1994 episode. The subsequent path of Treasury yields was less steep, which may reflect in part the improved FOMC communications as well as the smaller magnitude and speed of target rate increases. In 2004, the newly introduced "measured pace" language appeared to lead to declines in uncertainty about the policy rate as well as uncertainty about long-term rates, though the earlier adjustments in rates during the bond market sell-off in the summer of 2003 likely also helped.

Table 1. **Economic Indicators at Time of Initial Tightening** (percent)

	Unemployment Rate	Staff NAIRU	Staff Ugap	Staff Output Gap[1]	Total Inflation[2]	Core Inflation[2]	LR Inflation[3]	Real FFR	LR Real FFR[4]
Feb 1994	6.4 (December 1993) 6.7 (January 1994) new	6 6½ (new)	0.4 0.2	-1.5 1993:Q4[e] -1.1 1994:Q1[f]	2.7 (Jan.)	3.2 (Jan.)	2¼	About 0	2¼
June 1999	4.2 (May 1999)	5¼	-1.05	2.8 1999:Q1[e] 2.7 1999:Q2[f]	1.4 (Q2[f])	1.3 (Q2[f])	2½	About 3½	4
June 2004	5.6 (May 2004)	5	0.6	-1.5 2004:Q1[e] -1.2 2004:Q2[f]	2.4 (May)	1.4 (May)	1½	About 0	2¾

[1]Percent difference between actual and potential real GDP; a negative number indicates that the economy is operating below potential.

[2]Percent change from a year earlier. For 1994, the CPI; for 1999 and 2004, PCE index.

[3]Staff assumption about longer-run value for core inflation consistent with baseline forecast; for 1994 (CPI); for 1999 and 2004 (PCE).

[4]Staff assumption. For 1999, the staff assumed the "neutral" level of the real funds rate was 4 percent, but would decline to 3 percent in the long run as productivity decelerated.

e Staff estimate

f Staff forecast

Source: FOMC Bluebooks and Greenbooks.

Table 2. **Central Tendency of Economic Projections, FOMC participants, *Monetary Policy Report***

	Real GDP growth (percent, Q4/Q4)			Unemployment rate (Q4 level)			CPI inflation (percent, Q4/Q4)		
	1993	1994	1995	1993	1994	1995	1993	1994	1995
Feb 1993	3–3¼			6¾-7			2½–2¾		
July 1993	2¼–2¾	2½–3¼		6¾	6½–6¾		3–3¼	3–3½	
Feb 1994		3–3¼			6½–6¾			About 3	

	Real GDP growth (percent, Q4/Q4)			Unemployment rate (Q4 level)			CPI inflation (percent, Q4/Q4)		
	1998	1999	2000	1998	1999	2000	1998	1999	2000
July 1998	3–3¼	2–2½		4¼–4½	4½–4¾		1¾–2	2–2½	
Feb 1999		2½–3			4¼–4½			2–2½	
July 1999		3½–3¾	2½–3		4–4¼	4¼–4½		2¼–2½	2–2½

	Real GDP growth (percent, Q4/Q4)			Unemployment rate (Q4 level)			PCE inflation (percent, Q4/Q4)[1]		
	2003	2004	2005	2003	2004	2005	2003	2004	2005
July 2003	2½–2¾	3¾–4¾		6–6¼	5½–6		1¼–1½	1–1½	
Feb 2004		4½–5			5¼–5½			1–1¼	
July 2004		4½–4¾	3½–4		5¼–5½	5–5¼		1¾–2 (core)	1½–2 (core)

[1]FOMC participants projected total chain-weighted PCE inflation in July 2003 and February 2004, and core PCE inflation in July 2004.
Source: *Monetary Policy Reports*

February 1994

Prior to the commencement of tightening on February 4, 1994, the real economy was still working through headwinds associated with the 1990−1991 recession; inflation had come down, but most Committee participants judged that a further deceleration was desirable and believed that policy would have to be tightened at some point to contain inflation. The stance of monetary policy was accommodative: The target for the federal funds rate had remained at 3 percent since September 1992 (figure 1); with core CPI inflation averaging about 3 percent, the real funds rate was well below the staff's estimate of 2 percent for the longer-run real federal funds rate. Financial markets were characterized by declining interest rates and low volatility (figures 2 and 10).

By early July 1993, the economic expansion appeared to be firmly established, but the economy was growing at a somewhat slower pace than participants had projected earlier, and participants lowered their forecasts for real GDP growth in 1993 noticeably (table 2). However, they continued to be perplexed by the pickup in inflation in the early months of the year, and they revised their forecasts for inflation in 1993 up fairly significantly. In his July *MPR* testimony, Chairman Greenspan explained the need for monetary policy "to remain alert to the possibility that an ill-timed easing could be undone by a flare-up of inflation expectations, pushing long-term interest rates higher, and short-circuiting essential balance sheet repair." He indicated, as did the minutes from the July meeting, that a rise in inflation expectations, even if not validated by economic fundamentals, could temper gains against inflation. The discussion at the August meeting suggests that participants thought the Chairman's testimony combined with the earlier move to a tightening bias at the May meeting had convinced financial markets that the Committee would not fall behind the curve (table 3).[2]

[2] At this time, the policy directive contained a sentence indicating the Committee's "bias" or "tilt" over the intermeeting period. If the bias in the policy directive was asymmetric toward tightening, the directive would have said, "a somewhat higher federal funds rate would or a slightly lower federal funds rate might be acceptable in the intermeeting period," whereas a symmetric bias would have said, "slightly greater reserve restraint or slightly lesser reserve restraint would be acceptable in the intermeeting period." Before the regular publication of FOMC statements, the public remained uninformed about the bias until the minutes were released two days after the subsequent FOMC meeting.

Table 3. **FOMC Decisions Taken in Year before Tightening Cycle of February 1994–February 1995**

Date	FF target	Bias[1]	Publish statement?[2]	Dissents	Reason for dissent
2/1993	3.00	Symmetric	N	--	
3/1993	3.00	Symmetric	N	Angell, Lindsey	Angell wanted to adopt tightening bias Lindsay wanted to raise funds rate target
5/1993	3.00	Tightening	N	Angell, Boehne	Angell wanted to raise funds rate target Boehne wanted to retain symmetric bias
7/1993	3.00	Tightening	N	Angell	Wanted to raise funds rate target
8/1993	3.00	Symmetric	N	--	
9/1993	3.00	Symmetric	N	--	
11/1993	3.00	Symmetric	N	--	
12/1993	3.00	Symmetric	N	Angell, Lindsey	Thought monetary policy overly accommodative and wanted to adjust promptly to more neutral stance Meeting minutes note "a number" said decision was a "close call"
2/1994	3.25	Symmetric	Y	--	
Total increase over tightening cycle (basis points) = 300 Number of increases = 7					

[1]During this time period, the policy directive to the Desk contained a "bias" or "tilt." If the bias in the policy directive was asymmetric toward tightening, the directive would have said, "a somewhat higher federal funds rate *would* or a slightly lower federal funds rate *might* be acceptable in the intermeeting period" (emphasis added), whereas a symmetric bias would have said, "slightly greater reserve restraint or slightly lesser reserve restraint would be acceptable in the intermeeting period." Before the regular publication of FOMC statements, the public remained uninformed about the bias in the policy directive until the release of the minutes, which in those days were published two days after the subsequent FOMC meeting. Views differ on whether the bias was intended to provide the Chairman with guidance for policy changes over the intermeeting period, to signal future policy more generally, or to help build consensus within the Committee. For additional details, see the FOMC memo by David E. Lindsey titled "A Modern History of FOMC Communication: 1975-2002," June 24, 2003.

[2]The first statement was released to the public with the February 1994 decision to raise the target for the federal funds rate. This statement was issued by Chairman Greenspan. Until June 1999, statements were issued by Chairman Greenspan or the FOMC when the target for the funds rate was changed, and by the Federal Reserve when the funds rate target change was accompanied by a Board-authorized change in the discount rate. Statements were not issued when the funds rate target was left unchanged.

Over the fall of 1993, incoming data pointed to a somewhat more rapid expansion in economic activity and more favorable inflation developments than previously anticipated. The December meeting minutes reported that participants "generally expected the economy to settle into a pattern of moderate growth over coming quarters at a trend rate close to or somewhat above the economy's long-run potential," which was viewed as maintaining some margin of economic slack and modest downward pressure on inflation. However, the transcript from the December 1993 meeting indicates that a number of participants anticipated an acceleration in real GDP in 1994, and many were concerned about potential inflationary pressures or thought real short-term interest rates were too low. Participants seemed about equally divided between those who wanted to wait for additional information before raising the funds rate target and those who wanted to tighten policy immediately; the meeting minutes note that "a number" thought the decision "a close call" (table 3).

The response of longer-term Treasury yields to FOMC communications and the stronger-than-expected economic data releases in late 1993 and early 1994 was muted. As can be seen in figure 4, the 10-year Treasury yield rose by about 25 basis points over the fall of 1993, but remained below the level of six months before. One-year forward rates at horizons of 1-to-9 years ahead (figure 3) also decreased in 1993, on net, suggesting that market participants expected that interest rates would remain low in the near- and longer-term future. Market-based measures did not indicate significant increases in interest rate uncertainty prior to the tightening announcement. The implied volatility of short-term interest rates, measured by the six-month-ahead 90 percent confidence interval on three-month LIBOR (figure 9) was little changed, as was the implied volatility of 10-year Treasury futures six months ahead (figure 10).

Despite the strength of economic data releases over the fall and winter, market expectations for the federal funds rate did not increase significantly. As shown in figure 6, the one-year-ahead Blue Chip federal funds rate forecast actually decreased slightly over the six months preceding the FOMC's decision to increase the target rate. Survey data suggest that some market participants may have underestimated the economic momentum and resulting inflationary pressures. As shown in figure 7, the one-year-ahead Blue Chip forecast for real GDP growth did not increase, on net, in the six months prior to the policy tightening, although expectations for economic growth remained above 2.5 percent. A similar forecast for one-year-ahead consumer price inflation (figure 8) edged down in the months prior to the tightening, but remained above 3 percent. The S&P 500 stock price index (figure 11) rose 6.5 percent during the six months leading to the tightening and was up 24 percent from its pre-recession level. In spite of the market expectation that interest rates would remain low in the near future, some investors may have assigned a higher probability to an increase in rates. As shown in figure 15, net noncommercial positions in Eurodollar futures turned short in late 1993 and in early 1994, suggesting that speculative investors were betting on a rate hike.

At the December FOMC meeting, participants discussed the best way to signal to financial markets and the public that a decision to raise rates might come soon. While some spoke of wanting a tightening decision at the meeting, Chairman Greenspan recommended that the Committee hold its current target for the funds rate and symmetric bias in the policy directive, but prepare to tighten policy early in 1994. In response to a suggestion that the Chairman use an upcoming speaking opportunity to signal that monetary policy would soon be changed, Chairman Greenspan tried to deliver the message in testimony to the Joint Economic Committee on the Monday before the February FOMC meeting, saying that it was "important to emphasize that monetary policy must not overstay accommodation" and that "the foundations of the economic expansion are looking increasingly well-entrenched." He went on to note that historical experience suggested that "higher price inflation tends to surface rather late in the business cycle" and that "the challenge of monetary policy is to detect such latent instabilities in time to contain them."

When the FOMC met later that week, participants generally agreed that the economy was entering 1994 with considerable forward momentum and expected that the expansion was likely to be sustained over the year at a pace somewhat above the economy's longer-run potential rate. Slack in resource utilization was small as measured by the staff's estimates of the unemployment rate and output gaps (table 1) and was likely to continue to shrink. Moreover, they saw little likelihood of further progress in reducing inflation and the "distinct risk" of higher inflation. These views were reflected in the projections prepared for the upcoming *MPR* (table 2).

Against this backdrop, participants generally favored an increase in the target for the federal funds rate. A number argued in favor of a 50-basis-point increase in order to get out in front of inflation, but most wanted to remove the high degree of policy accommodation gradually. Committee members expressed concerns about a large announcement effect because it had been so long since the Committee's last policy rate tightening in 1989. They decided to raise the target rate by 25 basis points, and for the first time, to have the Chairman issue a very brief postmeeting statement. A fuller explanation of the Committee's views came a few weeks later in the Chairman's monetary policy testimony.

Despite the Chairman's JEC testimony, financial market participants were surprised by the policy announcement, leading to a sharp run-up in rates and volatility. As shown in figures 2 and 4, the 10-year nominal Treasury yield increased 14 basis points on the day of the announcement, and subsequently about 200 basis points over the next nine months. Several factors may account for the sharp rise in Treasury yields: The expected path of the federal funds rate over the coming year implied by futures market quotes right before the tightening—111 basis points—substantially underestimated the subsequent tightening—300 basis points. Thus, the sequence of tightening moves in this episode came as a surprise to the market. The more-rapid pace of tightening occurred in response to data releases over several months that repeatedly led to a marking up of expectations for economic growth and inflation (figures 7 and 8) and, in turn, a higher level of yields. There was a significant rise in uncertainty about the path of short-term rates, as can be seen in the widening of the Eurodollar futures option-implied confidence interval (figure 9). Uncertainty about longer-term rates also rose notably (figure 10), likely contributing to an increase in the term premium priced into the 10-year Treasury yield (figure 5). Roughly one-half of the 200-basis-point increase in the 10-year yield can be attributed to a rise in the term premium.[3] Finally, the rise in longer-term yields

[3] The estimates are based on the staff's term structure model.

may have been magnified by technical factors such as the hedging of mortgage-backed securities (MBS).

In contrast to interest rates, stock prices (figure 11) stabilized quickly after an initial negative reaction, and fully recovered their losses later in the tightening cycle, likely because the economy strengthened. Measures of the implied volatility of stock prices initially increased (figure 12), and stock market liquidity modestly deteriorated, but both reverted to normal levels after several months. Corporate yield spreads, particularly those faced by lower-tier issuers (figure 13), also narrowed. The movements in these markets are consistent with investors judging that the economic outlook was improving. Although U.S. Treasury bond funds experienced outflows throughout 1994 and in 1995 (figure 14), fund redemptions were gradual and relatively contained compared with more recent episodes. Note that the assets of bond funds were small at that time, and financial products such as exchange-traded bond funds did not yet exist.[4]

June 1999

Concerns about the outlook for the U.S. economy began to mount in the fall of 1998. Despite the Asian financial crisis that began the previous year, the domestic economy was still strong and labor markets were tight, but the shift in risk sentiment from financial problems abroad was transmitted to U.S. financial markets after the Russian default and the collapse of Long-Term Capital Management in August and September, respectively. In response to concerns about the potential for a significant weakening of the U.S. economy, the FOMC eased policy by lowering the federal funds rate 75 basis points over the September to November period (figure 1; table 4). As a result, the stance of monetary policy moved from mildly restrictive to relatively

[4] Although Treasury markets were generally orderly, some leveraged investors experienced large losses leading to portfolio liquidations. For example, on December 6, 1994, Orange County in California announced that its fixed income portfolio had lost $1.5 billion, and it filed for bankruptcy protection several days later.

Table 4. **FOMC Decisions Taken in Year before Tightening Cycle of June 1999–May 2000**

Date	FF target	Bias	Publish statement?	Dissents	Reason for dissent
6/1998	5.50	Tightening (retained)	N	Jordan	High money and credit growth fueling rapid domestic demand
8/1998	5.50	Symmetric	N	Jordan	Need restraint for domestic demand
9/1998[1]	5.25	Easing	Y	--	
10/1998[2]	5.00		Y	--	
11/1998[3]	4.75	Symmetric	Y	Jordan	Easing in September and October were sufficient to address stress in financial markets
12/1998	4.75	Equally likely[4]	N	--	
2/1999	4.75	Equally likely	N	--	
3/1999	4.75	Equally likely	N	--	
5/1999	4.75	Tilted toward firming	Y[5]	--	
6/1999	5.00	No “predilection”	Y	McTeer	Tightening unnecessary to contain inflation
Total increase over tightening cycle (basis points) = 150 Number of increases = 6					

[1]FOMC statement noted: “The action was taken to cushion the effects on prospective economic growth in the United States of increasing weakness in foreign economies and of less accommodative financial conditions domestically.”

[2]Conference call; FOMC statement noted: “Growing caution by lenders and unsettled conditions in financial markets more generally are likely to be restraining aggregate demand in the future.”

[3]FOMC statement noted: “Growing caution by lenders and unsettled conditions in financial markets more generally are likely to be restraining aggregate demand in the future.“

[4]Bias language changed to “prospective developments are equally likely to warrant an increase or a decrease in the federal funds rate operating objective during the intermeeting period.”

[5]The FOMC issued a statement following the May 1999 meeting to inform the public about the change to the bias in the policy directive. Since May 1999, the FOMC has issued a statement following each meeting; statements have also been issued following conference calls at which a change in policy was made.

accommodative. The easing was largely viewed by market participants as a response to the turbulence in financial markets (figure 1). As the turbulence receded, stock market volatility (figure 12) decreased and market liquidity returned to a more normal level.

By end of 1998, the turbulence in global financial markets was abating and the risks to the outlook appeared to be more balanced. Real economic activity remained strong during the second half of the year, boosted in part by a surge in equity markets that followed the policy easing (figure 11). Prospects for 1999 had brightened, and labor markets were already very tight. However, signs of rising inflation were scant; CPI inflation—the measure the Committee used in its projections in the *MPR*—was around 1½ percent but was expected to rise to 2 to 2½ percent in 1999 as the influence of declines in prices of energy and non-oil imports waned and labor markets remained tight (table 2).[5] The Committee's projections presented with the February 1999 *MPR* indicated that the expansion was expected to moderate, keeping the unemployment rate steady. At the December 1998 and January 1999 meetings, members generally agreed that if labor markets continued to tighten, cost and price pressures would begin to rise, and some noted that the persistence of rapid increases in the money supply would be a sign that monetary policy was too accommodative to contain inflationary pressures. However, members did not anticipate any substantial deterioration in the inflation climate if economic growth moderated as they were forecasting.

The S&P 500 index recovered all of its losses by the end of 1998, and increased more than 10 percent in the six months prior to the policy tightening (figure 11). Corporate bond spreads (figure 13) were also coming down, although the spreads on both investment-grade and high-yield bonds remained somewhat above their pre-crisis lows. Net noncommercial positions in interest rate futures (figure 15) were near neutral, suggesting that speculative investors considered the prevailing level of rates as correctly reflecting their policy expectations. However, by early 1999, investors had started to expect that the Committee would gradually remove the policy stimulus. As a result, the Blue Chip 1-year ahead federal funds rate forecast (figure 6) drifted up in the six months

[5] A large discrepancy had emerged between the CPI and PCE measures of consumer price inflation, with core CPI inflation at 2¼ percent and core PCE inflation around 1¼ percent.

leading to the policy tightening, and both short- and longer-term forward rates (figure 3) moved up.

At FOMC meetings that spring, participants discussed the extent to which accelerating productivity was helping to sustain higher rates of output growth and levels of unemployment about 1 percentage point below that staff's estimate of the NAIRU without generating price inflation. Wage increases remained moderate, and participants attributed that to the still-low levels of price inflation. However, a broad-based increase in consumer price inflation of 0.4 percent in April 1999, combined with a firming of oil and other commodity prices, raised volatility in financial markets. At the May FOMC meeting, a number of participants indicated that they were becoming increasingly uncomfortable with the stance of monetary policy. Using the core PCE inflation rate, the real federal funds rate was 3½ percent, which was not particularly accommodative compared with 1994 or 2004 (table 1).[6] Chairman Greenspan stated that, although he was not ready to increase the target funds rate, he agreed with many others to adopt a tightening bias and, for the first time, to announce the change in tilt immediately after the decision. The statement released following the FOMC meeting sent the message that the Committee was prepared to act to forestall a rise in inflation (table 4). It ended by saying: "Against the background of already-tight domestic labor markets and ongoing strength in demand in excess of productivity gains, the Committee recognizes the need to be alert to developments over coming months that might indicate that financial conditions may no longer be consistent with containing inflation." The official message further strengthened anticipation of policy tightening by investors and suggested to some that the tightening might be more aggressive than they had expected.

Over the intermeeting period prior to the initial 25 basis point tightening in June 1999, the incoming information on economic activity reinforced market expectations for firmer monetary policy. The meeting minutes noted that "incoming information continued to suggest a vigorous expansion but also subdued inflation despite very tight

[6] On account of the tailwinds from faster growth in labor productivity, the staff judged that the neutral level of the real federal funds rate was around 4 percent; the staff estimate of the longer run real rate was 3 percent, an estimate based on an assumption that productivity growth would slow.

labor markets." Signs of a pickup in inflation were mixed. Those participants concerned about the risk of higher inflation cited some firming in commodity prices and average hourly earnings as well as an uptick in some survey-based measures of inflation expectations. But broader measures of hourly compensation were still rising moderately, and strong ongoing gains in productivity were damping unit labor costs. The Committee saw aggregate demand rising rapidly and was uncertain about the sustainability of substantial further increases in aggregate supply that might keep inflation in check. The minutes characterized the policy tightening as "a desirable and cautious preemptive step in the direction of reducing . . . a significant risk of rising inflation." The Committee discussed how large its initial move should be (or alternatively, how much of 1998's 75 basis points of easing should be unwound) and what cumulative increase would be needed to achieve its objective of relieving pressure on labor utilization and preventing an escalation of inflation. The Committee agreed to include a bit of "hawkish" language in its statement noting that "the full degree of adjustment [associated with the financial strains in 1998] is judged no longer necessary." In addition, some members wanted to retain the asymmetrical bias to convey their concerns about the risks of rising inflation. However, the majority voted to move the bias to symmetric, reflecting the fact that, based on the incoming data, they were still optimistic that a sequence of tightening moves might not be necessary (table 4). One participant dissented from the Committee decision, arguing that a tightening was unnecessary to contain inflation, which had not yet gotten out of hand.

The increase in the federal funds rate target was largely anticipated by investors, in part because of the tightening bias announced in May. The 10-year Treasury yield was therefore little changed on the announcement (figure 2). However, data on the economy surprised on the upside in early 2000, and market participants revised up their forecast of economic growth over the period (figure 7). As a result, Treasury yields (figure 2) and forward rates (figure 3) continued to move up. Overall, the magnitude of the increase in longer-term interest rates during the 1999–2000 tightening was smaller than that in 1994, likely reflecting the smaller magnitude and speed of the target rate increase as well as improved FOMC communications.

Stock prices (figure 11) moved higher after the June FOMC announcement, and increased, on balance, over the period of the tightening. Equity price volatility (figure 12) was fairly steady, except for a temporary rise in the spring of 2000. Corporate bond yield spreads (figure 13) were little changed over 1999, but spreads began to rise in early 2000 as concerns mounted over the profitability of the information technology sector. Treasury bond mutual funds did not experience significant outflows at the start of the policy tightening, and they experienced only modest outflows in early 2000 as the FOMC continued to tighten (figure 14). Net noncommercial positions in interest rate futures (figure 15) remained about neutral or small in magnitude throughout the tightening cycle.

June 2004

In the late spring of 2003, the FOMC saw a few tentative signs that the pace of economic activity might be firming, but with inflation low and inflation expectations subdued, it decided at its June 2003 meeting to reduce the federal funds rate target 25 basis points to 1 percent (figure 1; table 5). The move resulted in a sell-off in bonds (figures 2 and 3) as market participants reportedly viewed the rate cut as smaller than expected and had put some weight on the introduction of unconventional policy. The rise in interest rates was also reportedly amplified by technical factors such as MBS convexity hedging.

By the fall of 2003, the unemployment rate was falling, although it was still 1 percentage point above the staff's estimate of the NAIRU. But, with core PCE inflation having slipped to 1¼ percent, the Committee saw "the risk of inflation becoming undesirably low" as its "predominant concern for the foreseeable future." To signal its concern, the Committee announced after its August meeting that "policy accommodation can be maintained for a considerable period" (table 5). It repeated that forward guidance at each of the remaining three meetings of the year. By December, the risks of further disinflation had come down, and the Committee agreed to reword the postmeeting statement to reflect its evolving assessment of risks to the economy; it said that "the probability of an unwelcome fall . . . now appears almost equal to that of a rise in

Table 5. **FOMC Decisions Taken in Year before Tightening Cycle of June 2004–June 2006**

Date	FF target	Statement language about future[1]	Publish statement?	Dissents	Reason for dissent
6/2003	1.00 (25 bp easing)	Risks to growth “roughly equal” Risks to inflation weighted to downside—“predominant concern”	Y	Parry	Preferred to ease by 50 basis points
8/2003	1.00	Risks to growth “roughly equal” Risks to inflation weighted to downside—“predominant concern” Accommodation can be maintained for “considerable period”	Y	--	
9/2003	1.00	Risks to growth “roughly equal” Risks to inflation weighted to downside—“predominant concern” Accommodation can be maintained for “considerable period”	Y	--	
10/2003	1.00	Risks to growth “roughly equal” Risks to inflation weighted to downside—“predominant concern” Accommodation can be maintained for “considerable period”	Y	--	
12/2003	1.00	Risks to growth “roughly equal” Risks to inflation “almost equal” Accommodation can be maintained for “considerable period”	Y	--	
1/2004	1.00	Risks to growth “roughly equal” Risks to inflation “almost equal” Can be “patient in removing” accommodation	Y	--	
3/2004	1.00	Risks to growth “roughly equal” Risks to inflation “almost equal” Can be “patient in removing” accommodation	Y	--	
5/2004	1.00	Risks to growth “roughly equal” Risks to price stability “moved into balance” Accommodation can be removed at measured pace	Y	--	
6/2004	1.25	Risks to both goal variables “roughly equal” Can remove accommodation at measured pace	Y	--	
Total increase over tightening cycle (basis points) = 425 Number of increases = 17					

[1]In January 2000, the Committee dropped the bias language and replaced it with an indication of its view about risks to the outlook for growth and inflation—the so-called balance of risks language.

inflation." In addition, the Committee made the forward guidance more explicitly data dependent by adding the phrase "with inflation quite low and resource use slack" in association with its indication that it could maintain policy accommodation "for a considerable period."

By the January 2004 meeting, longer-term interest rates had moved down in response to another disappointing employment report (figure 2). However, the yield curve remained steep, with very low short-term real yields. The retention of language indicating that policy accommodation could be maintained for a "considerable period" had, as intended, worked to restrain market expectations for policy tightening, which had shifted out to October 2004.[7] However, a number of participants were still clearly uncomfortable with language that could be viewed as a commitment or as a signal of a longer period of low interest rates than might be warranted. In discussing whether to adopt new language indicating that the Committee believed it could be "patient in removing its policy accommodation," the Chairman and Governor Kohn argued that the new language was more flexible and would allow the Committee to respond to economic developments. The Chairman said that, in his view, the Committee "will have the full flexibility to sit for a year or to move in a couple of months."

Interest rates rose sharply during the spring of 2004 (figure 4) following the much stronger-than-expected employment report for March, other positive data releases, and rising inflation expectations (figure 8). In addition, the Chairman stated in congressional testimony that "the threat of deflation is no longer an issue." Policy uncertainty, as measured by the six-month ahead confidence interval on LIBOR, went up as well (figure 9).

Key questions in the minds of participants during the first half of 2004 were how to interpret the robust increases in productivity and whether the outsized gains explained the weakness in hiring. Most participants generally agreed that much, but not all, of the improvement in productivity reflected fundamental technical change (and thus higher

[7] By the time of the March 2004 meeting, another disappointing reading on payroll employment in February led market participants to assume that policy would remain on hold through year-end.

potential output) but expressed uncertainty about when and how much cyclical slowing might occur. While some moderation of productivity gains might generate more jobs, it also might lessen an important force holding down inflation.

During the same period, a number of participants began to express concerns that extremely accommodative financial conditions might have the potential over time to feed into speculative excesses that could undermine financial stability. In January, Chairman Greenspan said the term "bubble" was not yet appropriate, but asset pricing was getting very aggressive. The question of a possible "house price bubble" and the potential effects of a reversal on household balance sheets also surfaced during the Committee discussions early in 2004. Other issues raised included whether the narrowing of the risk spreads on corporate bonds was justified by reduced default risk or reflected reaching for yield; what would happen to household and business balance sheets when rates rose; what risks to the financial system were posed by the activities of the GSEs; and how Basel II would affect the structure and profitability of the banking system.[8]

By May, a strong employment report, higher core CPI inflation, and some signs of a pickup in labor compensation led to rapidly shifting policy expectations. The unemployment rate was 5¾ percent—still above the staff's NAIRU estimate of 5 percent. However, the minutes reported that a number of members noted that the outlook had "improved distinctly" since the March meeting and that most participants saw that the odds of further disinflation were "substantially reduced," although most saw "low inflation as likely." In response to the brighter economic outlook, as well as comments by Chairman Greenspan and other Committee members, market participants brought forward the expected timing of the first tightening from late in the year to the third quarter and saw a funds rate of 3½ percent by the end of 2005.

During the policy go-round at the May meeting, participants discussed the possibility of amending the statement language to indicate that the risks to price stability had "moved into balance," and of replacing "the Committee believes that it can be patient

[8] As one possible way to address such risks, at the March meeting Governor Bernanke suggested that the Committee consider a financial stability report similar to those prepared by other central banks.

in removing its policy accommodation" with "the Committee believes that policy accommodation can be removed at a pace that is likely to be measured." Chairman Greenspan concluded that "we have completed our period of accommodation, which was an endeavor to address the rather substantial contractionary forces that became evident in mid-2000." In discussing how to position the Committee to move at an upcoming meeting, several participants wanted to send a signal that while the Committee might want to start to tighten early, it intended to be gradual; a number of them specifically mentioned that they wanted to avoid having financial markets assume that the Committee might be as aggressive as it had been during the 1994–95 tightening cycle. And several noted that because the sentence describing their expected policy path would indicate that inflation was still relatively low and resource slack remained, it would lend support to the expectation of a gradual pace of tightening. The use of the words "likely to be measured" seemed to satisfy those who wanted the flexibility to move more aggressively, if needed, particularly if the outlook for inflation worsened. Nonetheless, some remained reluctant to make any direct statement about rates, arguing to eliminate the forward guidance language altogether.

Longer-term yields continued to increase after the change in the forward guidance, and markets began to adjust in advance of an expected tightening. As shown by the data on net noncommercial positions in interest rate futures (figure 15), speculative investors started positioning for an increase in Treasury yields prior to the announcement of the increase in the federal funds rate target on June 30, 2004. These positions were reversed almost immediately after the announcement. By the time of the June meeting, markets were anticipating a ¼ percentage point increase at that meeting (to 1¼ percent), with further increases that would bring the funds rate to 2¼ percent by December and 3¼ percent by the end of 2005.[9]

At the June meeting, the Committee noted further evidence that economic activity was increasing at a solid pace and that the strength in spending and employment appeared

[9] As Vincent Reinhart pointed out in his briefing to the Committee, the market's expectations for tightening (based on futures rates) during the first year after the federal funds rate target was first raised greatly exceeded the market's expectations just before the previous three tightening episodes, and were more in line with the amount of tightening that had actually occurred in those episodes.

self-sustaining. The discussion focused particular attention on indications that core inflation had risen noticeably from the low rate in 2003 and appeared likely to increase further. Among the factors cited were the large increases in prices of energy and intermediate materials, which appeared to be passing through to core consumer prices; the depreciation of the dollar; larger increases in hourly compensation; and evidence that near-term inflation expectations had risen. Some viewed the acceleration in inflation as temporary and noted that longer-run inflation expectations were still well-anchored, but others argued that policy should begin to be adjusted before the pickup became embedded in longer-run inflation expectations; several noted the importance of maintaining the Committee's inflation-fighting credibility. In the economic projections prepared for the upcoming *MPR*, participants switched to providing forecasts for core PCE inflation as a better indicator of underlying inflation trends (table 2). They projected that under appropriate policy the unemployment rate would move down very gradually to a level at or just above 5 percent by the end of 2005 and core PCE inflation would remain close to the pace of 1¾ percent expected over the first half of 2004.

While most participants agreed that the Committee needed to move policy back to neutral over a period of time, a few indicated that they preferred removing any characterization of possible future policy actions from the postmeeting statement. Two members expressed reservations about retaining the "measured pace" language because it was likely to imply a steady tightening path of 25 basis points each meeting and might result in the Committee falling behind the curve as inflation rose. However, most viewed the addition of the sentence stating that, "nonetheless, the Committee will respond to changes in economic prospects as needed to fulfill its obligation to maintain price stability" as providing scope for adjusting the path for the funds rate in response to incoming economic information and their interpretation of its implications for economic activity and inflation. As the Chairman described the outlook for policy in his *MPR* testimony: "If economic developments are such that monetary policy neutrality can be restored at a measured pace, a relatively smooth adjustment of businesses and households to a more typical level of interest rates seems likely. Even if economic developments dictate that the stance of policy must be adjusted in a less gradual manner to ensure price stability, our economy appears to have prepared itself for a more dynamic adjustment of interest rates. Of course, considerably more uncertainty and hence risk surrounds the behavior of the economy with a more rapid tightening of monetary policy than is the case when tightening is more measured. In either scenario, individual instances of financial strain cannot be ruled out."

Due in part to the change in the forward guidance in May, the market reaction to the June 2004 FOMC action was much more muted than in the 1994 episode, although the adjustments in rates during the summer 2003 sell-off likely also helped limit the market reaction to tightening. The 10-year Treasury yield in fact declined 8 basis points on the day of the initial target rate increase, and continued to edge lower over the next few months (figure 2). Long forward rates showed even more striking declines (figure 3). These declines in longer-term yields and long forward rates during a period of policy tightening were quite unusual, and were termed by Chairman Greenspan as a "conundrum." The declines mainly reflected lower term premiums (figure 5), although the principal reason for the decline in term premiums is not clear. One possible explanation is that FOMC communications at the time (the newly introduced "measured pace" language) led to declines in uncertainty about short-term and longer-term rates (figures 9 and 10). However, other factors could also have been at play, including the "global savings glut," which resulted in strong foreign demand for U.S. Treasury securities, and the increased need for pension funds and life insurers to hold longer duration assets.

Equity prices (figure 11) initially moved lower but quickly recovered and continued to increase throughout 2004, while corporate bond spreads (figure 13) decreased further following the announcement, in particular for high-yield bonds. Investment flows to U.S. Treasury mutual funds (figure 14), which were negative in the spring of 2014, turned positive after the announcement and remained mostly in positive territory throughout the tightening cycle.

Treasury Yields, Policy Expectations and Macro Forecasts During Previous Tightenings of Monetary Policy

Figure 1: Federal Funds Target Rate

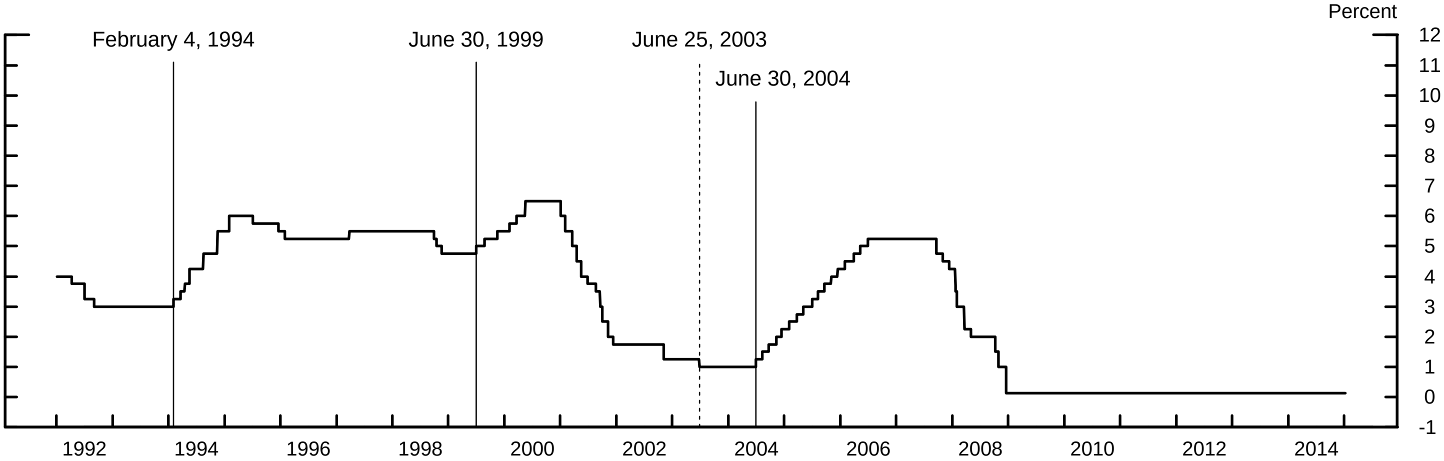


Figure 2: 10-Year Par Treasury Yield

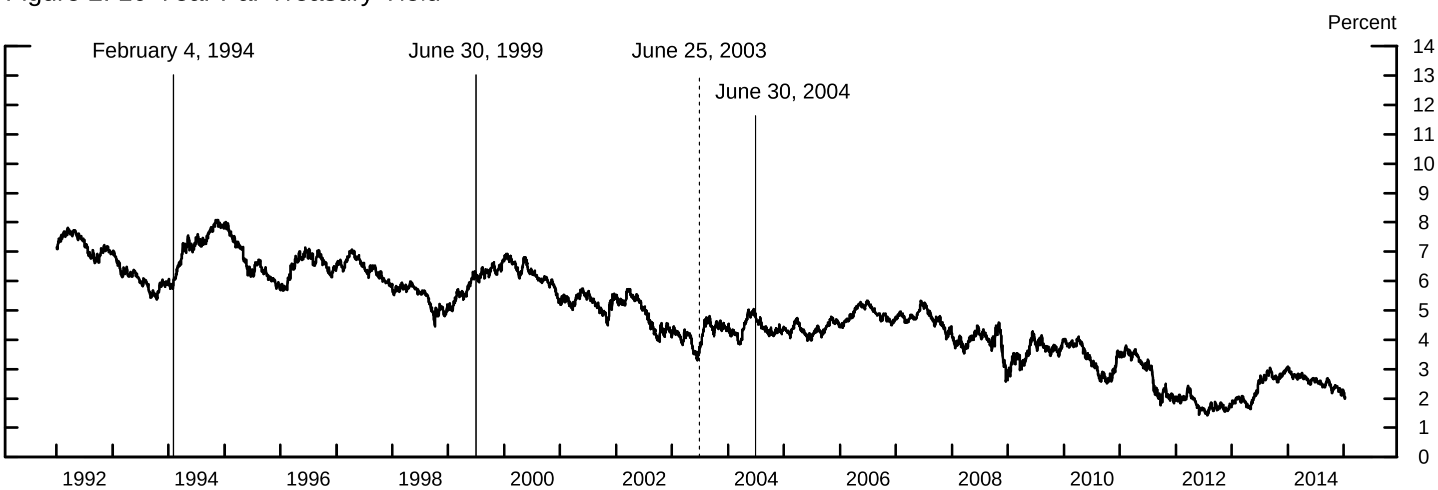
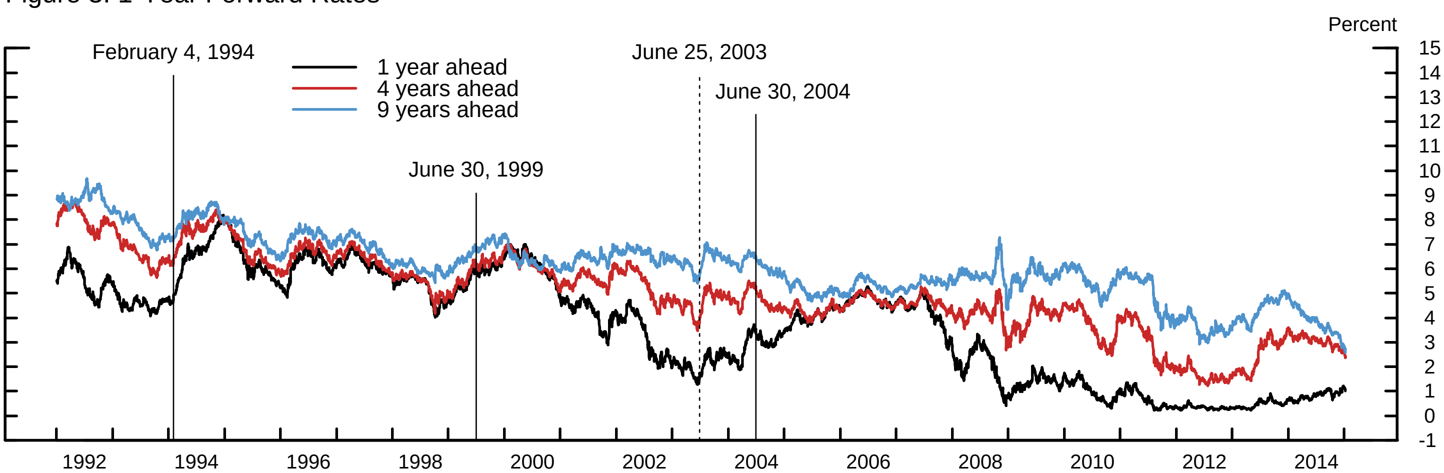


Figure 3: 1-Year Forward Rates



Treasury Yields, Policy Expectations and Macro Forecasts During Previous Tightenings of Monetary Policy

Figure 4: 10-Year Par Treasury Yield

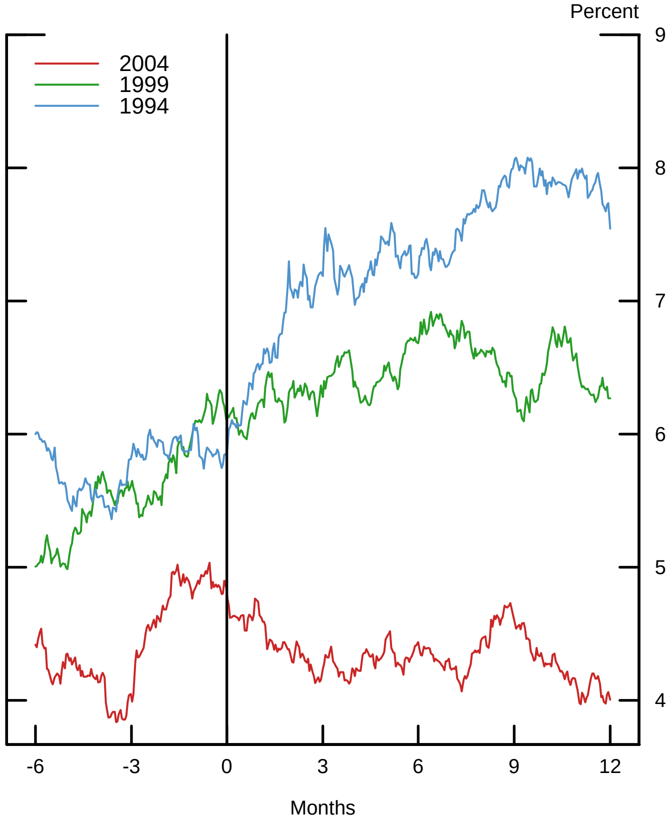
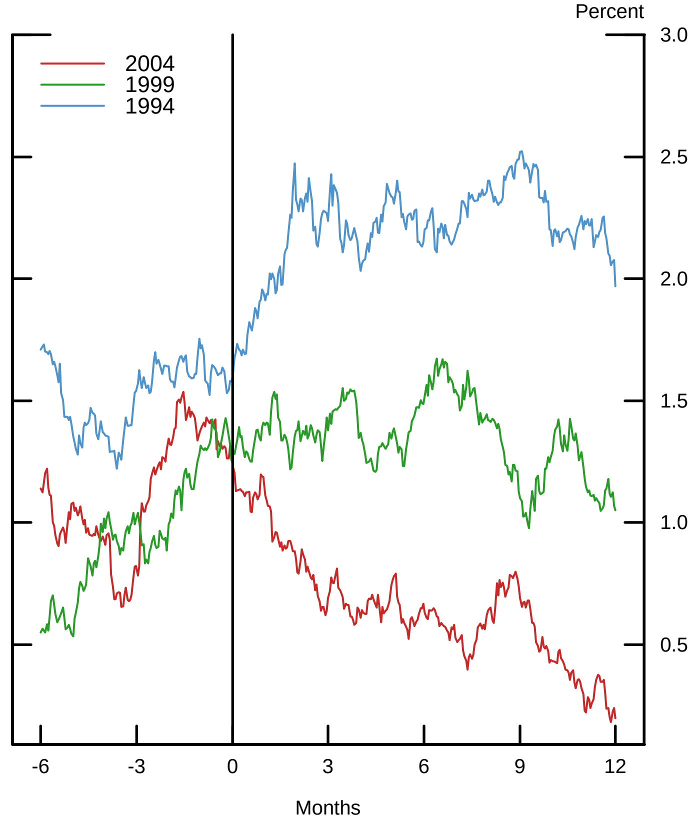


Figure 5: 10-Year Yield Term Premium



Note: The risk premium on the 10-year Treasury bond is estimated based on the staff's term structure model.

Figure 6: 1-Year-Ahead Blue Chip Federal Funds Rate Forecasts

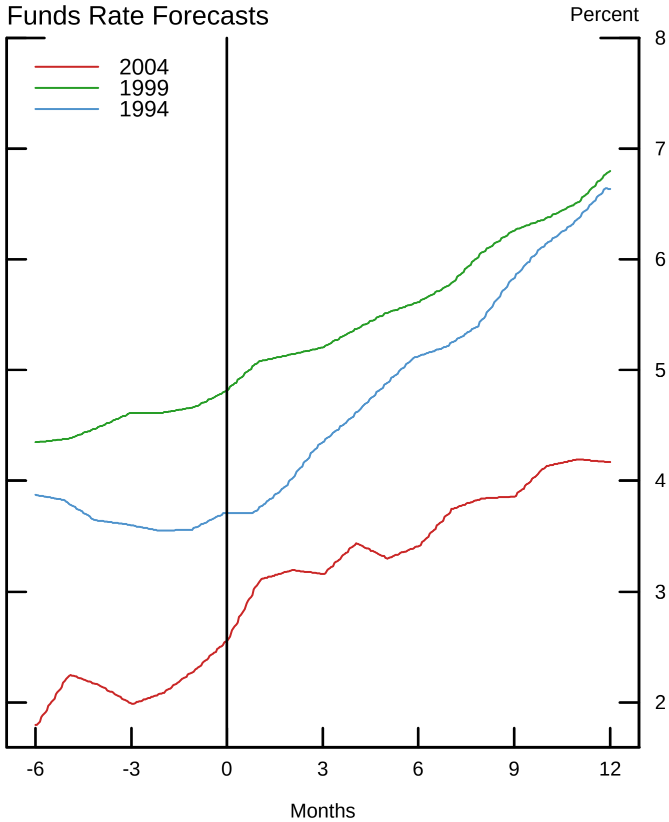
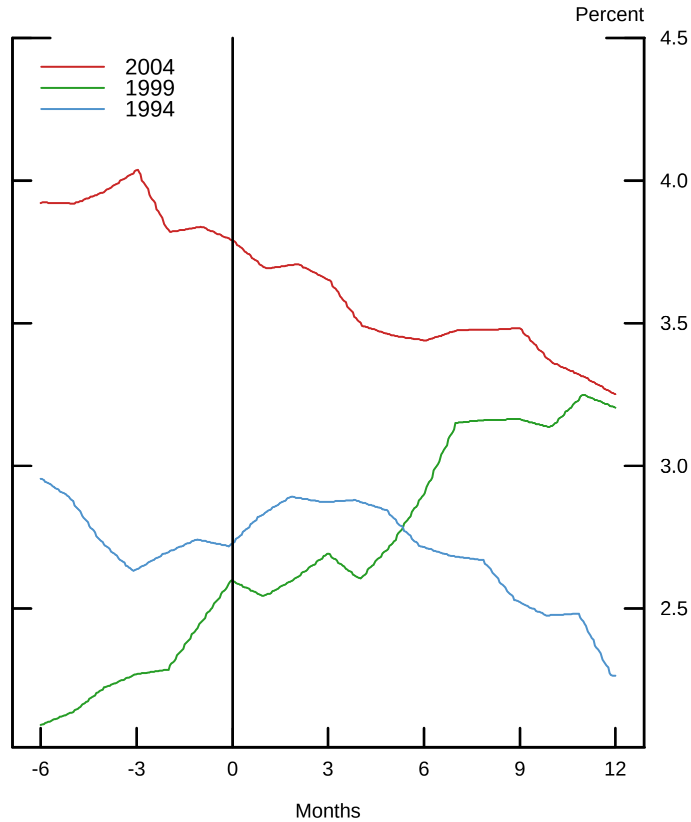


Figure 7: 1-Year-Ahead Blue Chip Real GDP Forecasts



Treasury Yields, Policy Expectations and Macro Forecasts During Previous Tightenings of Monetary Policy

Figure 8: 1-Year-Ahead Blue Chip CPI Inflation Forecasts

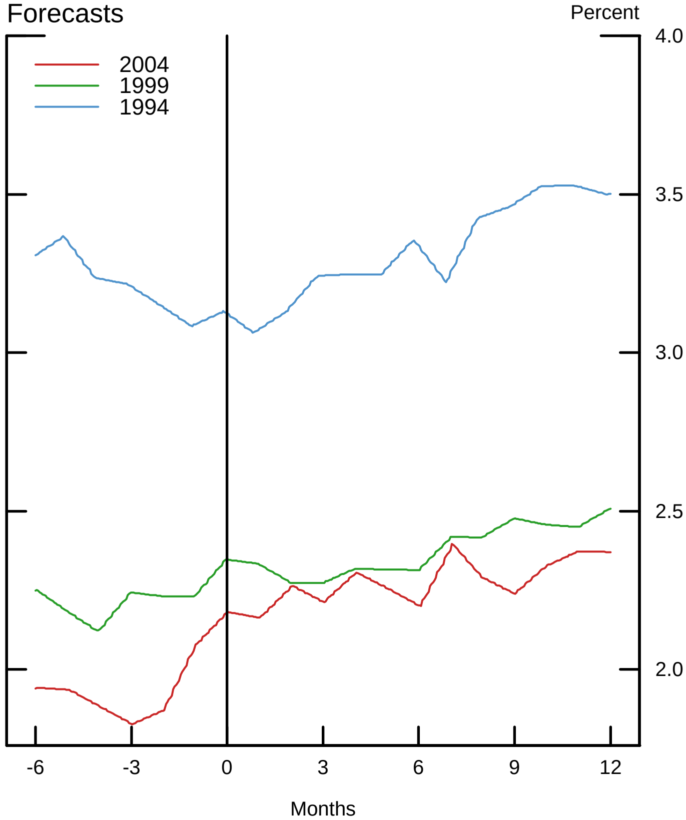
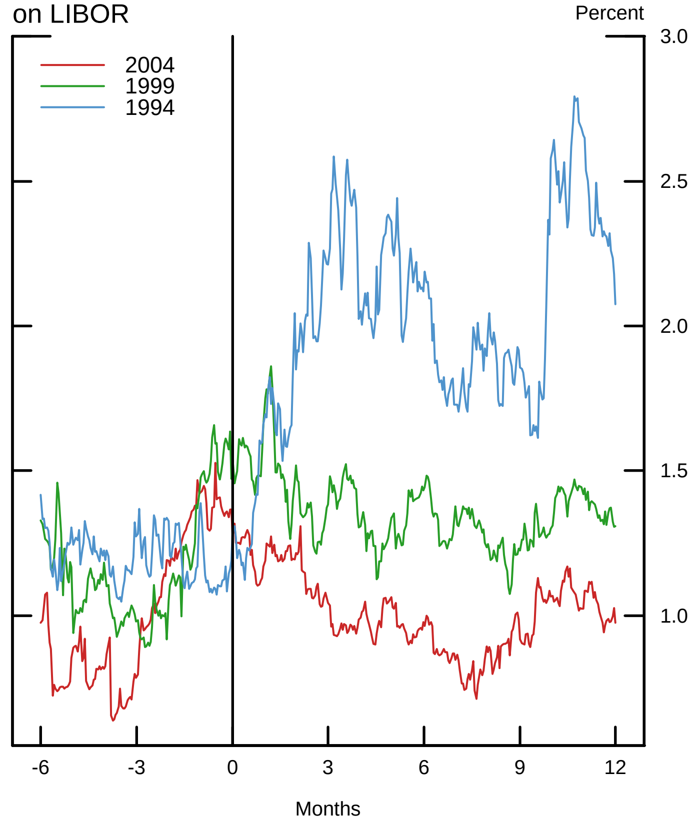
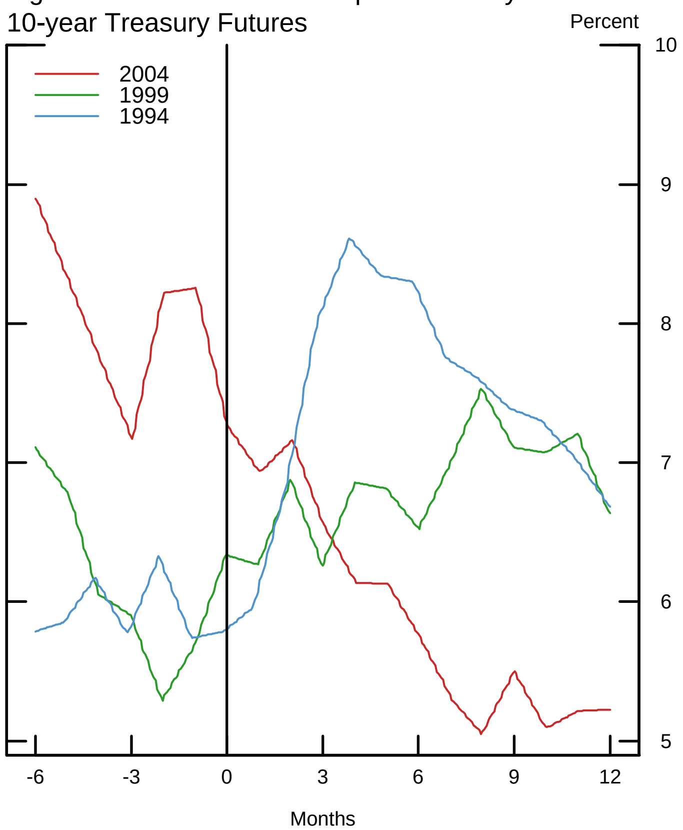


Figure 9: 6-Month-Ahead 90% Confidence Intervals on LIBOR



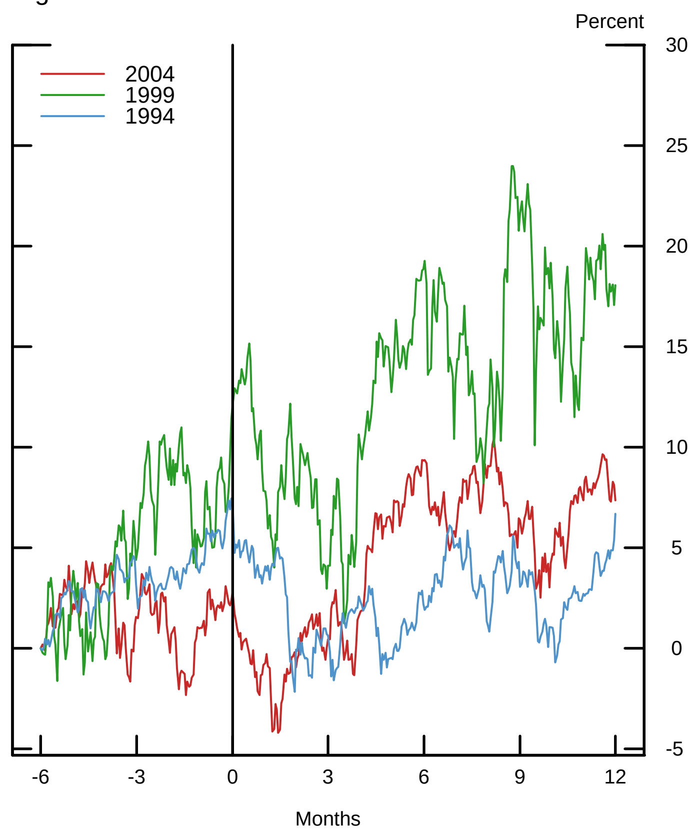
Note: The confidence interval is estimated using Eurodollar futures options.

Figure 10: 6-Month-Ahead Implied Volatility on 10-year Treasury Futures



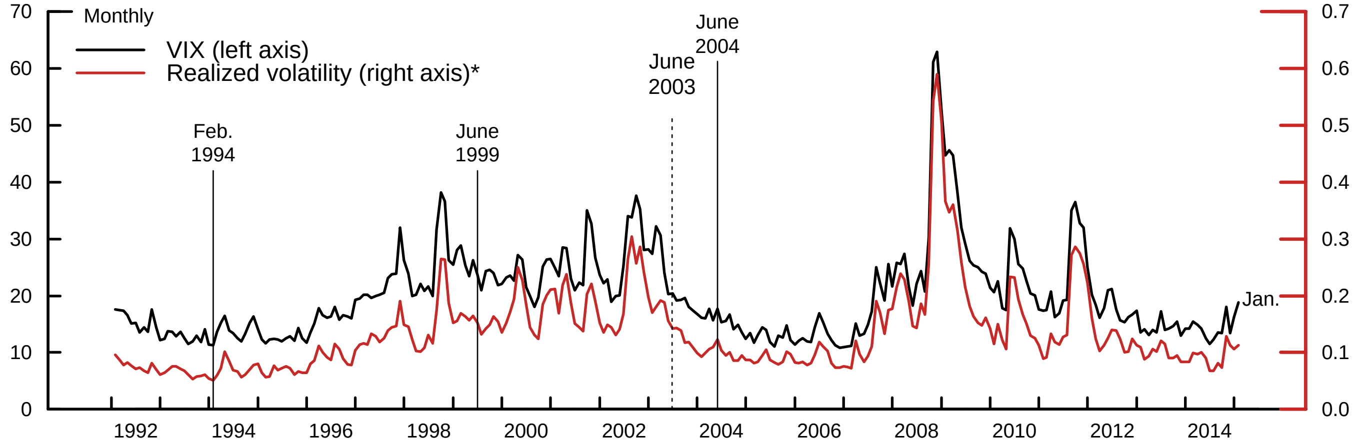
Note: The implied volatility is estimated using options on Treasury futures.

Figure 11: Cumulative Return of S&P 500 Stock Index



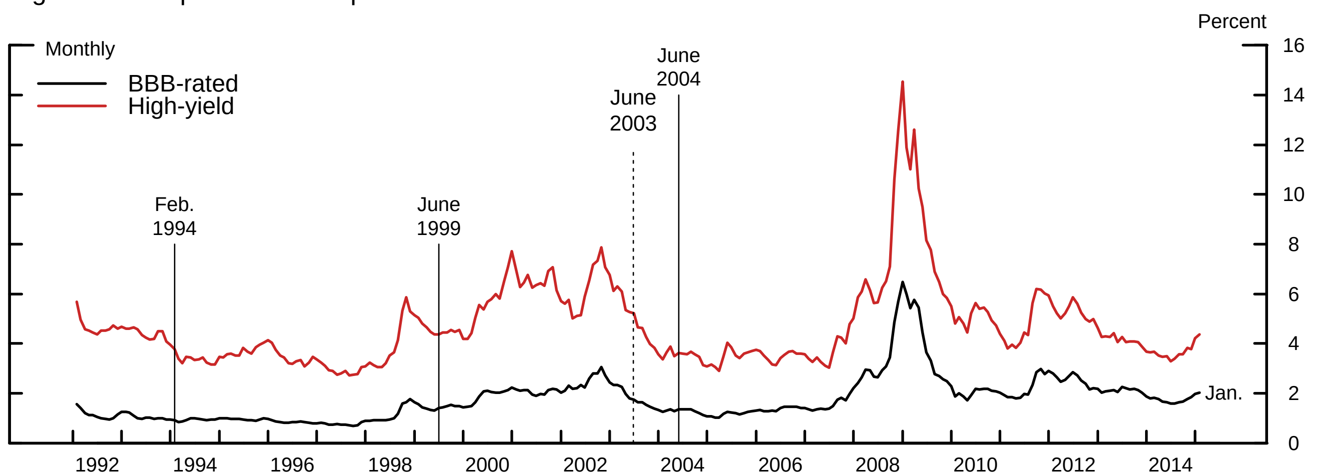
Select Financial Market Variables Around Previous Tightening Episodes

Figure 12: Volatility of Stock Returns



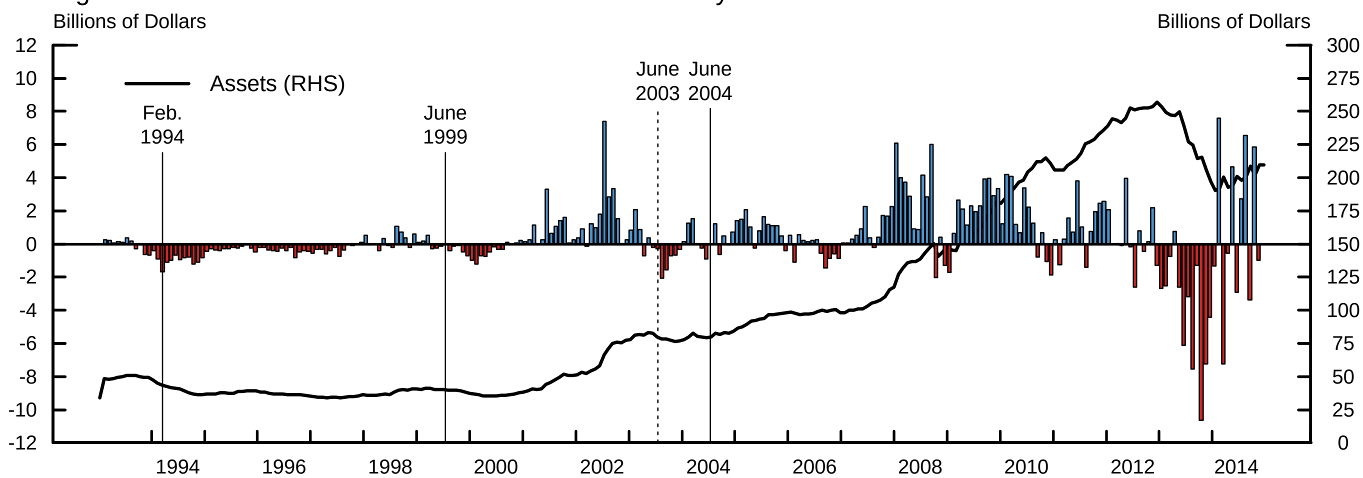
*20-day exponential moving average.
Source: Bloomberg.

Figure 13: Corporate Bond Spreads



Note: Spreads over 10-year Treasury yield.
Source: Staff estimates of smoothed corporate yield curves based on Merrill Lynch data and smoothed Treasury yield curve.

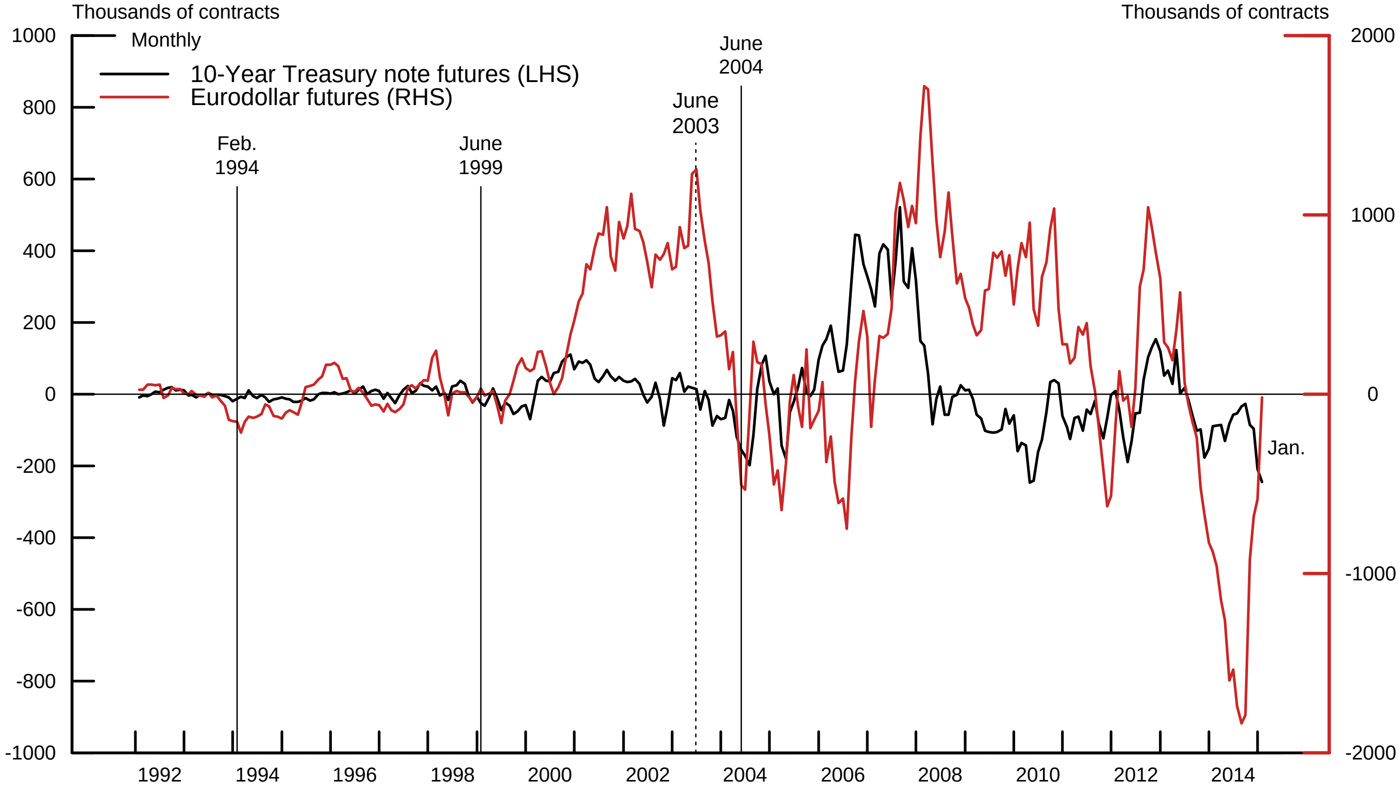
Figure 14: Investment Flows and Assets of U.S. Treasury Mutual Funds and ETFs



Note: Monthly Flows to U.S. Treasury bond funds and ETFs.
Source: Morningstar.

Select Financial Market Variables Around Previous Tightening Episodes

Figure 15: Net Noncommercial Positions in Interest Rate Futures



Source: CFTC. Figure shows the net interest rate futures positions of noncommercial traders above reporting levels set by CFTC.