

Monetary Policy Transparency and Private Sector Forecasts: Evidence from Survey Data

By Gordon H. Sellon, Jr.

In recent years, central banks around the world have greatly increased the monetary policy information they have provided the public. For example, many central banks have become more explicit about the longer-run objectives of monetary policy, such as long-run inflation objectives, and provided more detailed information about the monetary policy process. The Federal Reserve has taken a number of actions to promote transparency including, most recently, the announcement of enhancements to the FOMC's economic forecasts that are released to the public (Federal Open Market Committee).

The movement toward increased transparency arises largely from the view that increased transparency has important benefits, including more effective monetary policy. This view is based on theoretical and empirical research that has emphasized the importance of public expectations about monetary policy as a key factor in determining interest rates and other asset prices. In particular, this research suggests that improved predictability of monetary policy may reduce the volatility of asset prices and make monetary policy more effective by increasing a central bank's leverage over longer-term interest rates.

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The view that policy transparency may increase the predictability of monetary policy has found considerable empirical support. A number of recent studies used information from federal funds futures, Treasury bills, and Eurodollar futures markets to show that financial markets in recent years have been better able to predict future policy actions over relatively short-run horizons, for example, from one to six months ahead. However, there are relatively few studies of predictability over longer-term horizons, for example, one or more years ahead. Longer-horizon predictability of policy actions is especially important because it helps determine how much leverage central banks have over longer-term interest rates.

This article uses information from the Blue Chip Long Range Financial Forecasts to examine whether longer-horizon predictability has been associated with increased transparency. The Blue Chip survey, taken twice a year, asks a panel of forecasters to give their projections of interest rates over a ten-year horizon. Included in the survey are projections of the federal funds rate, which serves as the Federal Reserve's principal operating target. Thus, the survey provides an estimate of the federal funds rate path over the next ten years. Comparing these forecasts of the federal funds rate with the actual federal funds rate allows us to judge whether private sector forecasts of monetary policy have improved as policy transparency has increased.

The analysis in this article suggests several interesting conclusions. First, consistent with results using futures data, there has been a marked reduction in survey forecast errors at short-term horizons—but less improvement at longer horizons. Second, to the extent private sector longer-horizon forecasts of future monetary policy have improved in recent years, most of the improvement occurred from 2003 to 2006, when the Federal Reserve provided more explicit guidance about the future path of the federal funds rate. During this period, forecast errors over all horizons dropped remarkably. Indeed, this period appears to have driven most of the improvement in the Blue Chip survey forecasts seen over the entire 1986-2007 sample period. Third, the survey evidence reported in this article does not support the finding of some studies that forecasting improved suddenly after 1994. Fourth, the longer-horizon forecast errors have been largest when policy was being actively tightened or eased, especially during the 1990-92 and 2001-03 periods

of extended policy easing. Finally, longer-horizon forecast errors appear to have diminished during periods of tightening, but not during periods of easing.

The first section of this article provides a framework for discussing monetary policy transparency and how transparency is related to predictability of future monetary policy actions. The second section reviews existing evidence on improved short-run predictability of policy. The final section presents a detailed analysis of longer-horizon forecasts from the Blue Chip survey.

I. MONETARY POLICY TRANSPARENCY AND PREDICTABILITY

Central banks have been motivated to provide more information about monetary policy to the public, in part, because improved transparency may increase the effectiveness of policy by increasing financial markets' ability to predict future policy actions. Knowledge of the future path of monetary policy is important because this path is a key element in determining interest rates and other asset prices. In recent years, the Federal Reserve has taken a number of steps to improve policy transparency, which should improve the public's understanding of the monetary policy and increase the ability of financial markets to predict future policy actions.

Benefits of transparency

Generally speaking, transparency encompasses the information a central bank provides to the public about its policy objectives, its outlook for the economy, and the actions needed to reach its objectives given the outlook for the economy. While a central bank has other reasons to be transparent, including improved political accountability, this article focuses on how transparency may increase the effectiveness of monetary policy.

A useful definition of transparency and its potential benefits can be found in Swanson (p. 793):

- Transparency is the amount of information about the goals and conduct of monetary policy released to the public.

- Transparency should lead to an improvement in financial market and private sector understanding of how the central bank will set policy as a function of the state of the economy.
- This improved understanding should lead to an increase in the private sector's ability to forecast the central bank's policy instrument.

The Federal Reserve and other central banks currently use a short-term interest rate as a policy instrument. Without transparency, uncertainty about how the central bank will set this interest rate in the future can lead to considerable volatility of market interest rates as markets frequently change their views of future policy in response to new economic information. In addition, without transparency, markets may frequently be surprised by the timing and magnitude of policy actions, leading to additional volatility.

More important, transparency about the likely future path of the policy instrument can also be helpful in increasing the central bank's ability to influence longer-term interest rates. The expectations theory of interest rates suggests that long-term interest rates can be viewed as an average of the current short-term interest rate and the sequence of expected short-term rates over the maturity of the security. Since short-term rates will depend to a considerable degree on the policy interest rate, a market interest rate of any maturity can be expressed as an average of the current policy rate and the expected path of this policy rate over the maturity of the security. Viewed in this way, the expected future path for the central bank's policy rate serves as the underpinning for the entire structure of market interest rates. Thus, financial markets have great interest in learning how the central bank is likely to adjust this path in the future (Sellon).

The expectations theory also suggests that a central bank's ability to influence longer-term interest rates depends on whether a change in the policy rate is expected to be long-lasting. When a central bank changes the policy rate and does not indicate the future path of the rate, financial markets have to make their own judgment as to this future path. If markets believe the policy action is temporary and is likely to be reversed in the near future, the effect of the policy action on short-term rates will be large, but the action will have little effect on longer-term rates. In contrast, if markets expect the current policy action to

be long-lasting or expect further changes in the policy rate in the same direction, the effect on longer-term rates will be much larger.

When a central bank is not very transparent about the future setting of the policy rate, it defers to the market in setting the expected path for this rate, and markets may or may not move longer-term rates where the central bank thinks they should go. In contrast, if the central bank provides more information that allows markets to better judge the future policy path, it may be able to exert more leverage over longer-term rates.

A practical example may help illustrate this important point. At the start of an economic slowdown, a central bank will typically begin lowering its policy rate to offset the economic weakness. While short-term market rates will follow the policy rate closely, what happens to longer-term rates will depend on how much financial markets expect the policy rate will be reduced over time. If markets think the economic slowdown and decline in the policy rate will be temporary, long-term rates will not fall much. If the slowdown turns out to be more severe and the policy rate is cut further, markets will eventually lower longer-term rates. However, if markets knew at the outset how far the policy rate was likely to fall, longer-term rates would fall sooner and provide more stimulus to the economy. Thus, the degree of central bank transparency about the future path of the policy rate can be very important in determining the central bank's leverage over longer-term interest rates and the influence of its policy actions.

A framework for thinking about transparency

To achieve its long-run policy objectives, a central bank sets the level of its short-run policy interest rate and alters this rate in response to changing economic conditions. A convenient way of formalizing the policy process is to think of a central bank as following a Taylor rule:

$$r = r^* + \gamma (Y^E - Y^*) + \eta (\pi^E - \pi^*) \quad \gamma, \eta > 0.$$

According to this rule, a central bank sets its policy rate (r) based on the expected gap between actual output (Y) and potential output (Y^*) and the expected gap between inflation (π) and its inflation objective (π^*). When the output gap ($Y^E - Y^*$) and inflation gap ($\pi^E - \pi^*$) are zero, the central bank sets the policy rate equal to r^* , which can be viewed as the long-run equilibrium policy rate, or “neutral” policy rate.

The central bank implements policy by moving the actual policy rate above or below the neutral rate when the output gap and inflation gap are nonzero. For example, if an economic shock causes weaker economic growth, the central bank would lower the policy rate below the neutral rate by an amount that depends on the expected output and inflation gaps. As the economy responds to the monetary policy stimulus, the output and inflation gaps will diminish, and the central bank will raise the policy rate back to neutral.

The neutral rate plays an important role in the evolution of policy over time. The neutral rate can be thought of as consisting of two components: an equilibrium real interest rate, which is determined by productivity and other real factors, and the central bank's long-run inflation objective. The neutral rate will generally not be constant as both the real rate component and the inflation objective may change over time.

While no central bank adheres strictly to this simple Taylor rule, considerable empirical evidence suggests that the behavior of many central banks can be approximated by such a relationship (Taylor, Clarida, Gali, and Gertler; Judd and Rudebusch). Thus, it can be helpful in discussing the types of information a central bank might provide to the public to achieve greater transparency.

One obvious way that a central bank following a Taylor rule could achieve greater transparency is to provide information on the path for the policy rate, which it would derive from applying the rule, and its estimate of the neutral rate. Financial markets could then use this path to price financial assets. While central banks have become more transparent, few have gone so far as to publish their expected path for the policy rate.¹ The few banks that have begun to do so typically provide a short-run path over a few quarters ahead. Central banks have been reluctant to announce an extended path, in part, because the path could change frequently as economic and inflation forecasts change (Kahn).

Central banks could also achieve greater transparency without publishing a policy path by providing the public with additional information about its policy decision process. For example, in the context of the Taylor rule, a central bank could provide various forms of information: its estimate of potential output (Y^*) and its inflation objective (π^*), how it is likely to respond to changes in the output and inflation gaps (γ and η), and its economic and inflation forecasts (Y^E and π^E). Indeed, if a central bank is relatively systematic and exhibits rule-like behavior over time,

providing information on its estimate of potential output, its inflation objective, and its forecast for output and inflation may be sufficient to allow financial markets to construct a likely policy path without requiring the central bank to publish its own estimate of the path.

In thinking about the benefits of greater central bank transparency, it is important to recognize that the objective is not to eliminate private sector forecast errors. Indeed, the central bank's policy path will change constantly as economic shocks hit the economy and economic forecasts change; so some forecast errors are inevitable. However, central banks would like to eliminate "unnecessary" errors that result from the public's misperception of a central bank's policy objectives or its strategy for responding to economic shocks.

Steps toward greater transparency

In recent years, the Federal Reserve has taken a number of formal steps toward greater transparency, beginning in 1994 with a decision to announce policy actions at the time of a decision. A chronology of these changes is shown in Table 1. Rather than providing a detailed discussion of each of these actions, it may be helpful to focus on four major developments that have, or are likely to have, the largest impact on the predictability of monetary policy.

One of the most important developments, and a development that received no formal announcement, was a change in FOMC practices to make most policy decisions at regularly scheduled committee meetings. From 1989 to 1992, for example, most policy actions were made, not at regularly scheduled meetings, but in conference calls between scheduled meetings. In fact, of 24 policy changes made during this period, only six were made at regularly scheduled meetings. Such a practice makes it very difficult for financial markets to anticipate when a policy change will occur and will likely lead to increased volatility in financial markets. In contrast, from 1994 to January 2008, only six of 55 policy actions were taken outside of regularly scheduled meetings, typically in response to dramatic and unanticipated shocks to the economy and financial markets, such as the 1998 Russian debt and LTCM financial crisis or the events of September 11, 2001. Thus, since 1994, markets have generally had a much better idea of when a policy action was likely to occur.

Table 1

FEDERAL RESERVE STEPS TOWARD GREATER POLICY TRANSPARENCY

February 1994	Began issuing a statement immediately following an FOMC meeting at which a decision was made to change policy, including a brief rationale for the policy change. Began a practice of making most policy decisions at regularly scheduled committee meetings.
May 1999	Began providing a statement after every meeting, regardless of whether a change in policy was made, and provided a brief rationale for the decision. The statement also included a policy “tilt” indicating how policy was likely to be adjusted in the near term.
February 2000	Replaced the policy “tilt” language with an assessment of the balance of risks to growth and inflation.
March 2002	Began providing votes of individual members and rationale for any dissents to the committee’s decision.
November 2007	Began providing more frequent and detailed forecasts of all FOMC members and nonvoting reserve bank presidents.

A second important step toward transparency was to accompany the announcement of a policy decision with a description of its rationale. By providing the reasoning behind a policy decision, the FOMC gave markets a better understanding of its interpretation of economic developments and the types of developments that were most significant in the committee’s decision. Over time, financial markets can use this information to gain a better appreciation of the committee’s objectives and how its actions are seen as achieving these objectives.

A third step toward greater transparency was the FOMC’s increased emphasis on providing guidance about likely future policy actions. This guidance has taken different forms over time. In 1999, the committee provided language in its press statement that gave some indication of how the federal funds rate target was likely to change over the near term. In 2000, this information on the policy “tilt” was replaced by an assessment of the risks to economic growth and inflation and how these risks might be balanced, again giving an indication of the direction and likelihood of future moves in the federal funds rate objective. From 2003 to 2006, this guidance became unusually explicit as the committee first signaled that the policy rate would be held at a low level for an extended period and later signaled that rates would be raised in a systematic fashion.² Providing guidance in this way may improve finan-

cial markets' ability to predict policy actions over a short-term horizon extending several meetings ahead and, as discussed earlier, may increase the response of longer-term interest rates.

Finally, and most recently, in November 2007, the FOMC announced an enhanced forecasting process (Federal Open Market Committee). As part of these new procedures, the committee will provide long-range forecasts of economic growth, inflation, and unemployment four times a year instead of semiannually. In the context of the Taylor rule discussion earlier, more frequent forecasts may help financial markets forecast the policy path more accurately. In addition, by providing forecasts over a longer, three-year horizon, the committee will be providing the public with a better indication of committee members' estimates of the economy's potential growth and longer-run inflation objectives (Bernanke).

II. EVIDENCE ON SHORT-TERM MONETARY POLICY PREDICTABILITY

In recent years, a number of studies have provided evidence suggesting that increased monetary policy transparency may have contributed to an increased ability of financial markets to forecast future monetary policy actions. Most of this research has used information from financial markets, generally the Treasury bill markets and the markets for federal funds and Eurodollar futures, and focuses on a relatively short-run horizon, from one day out to six months.

In one early study, Roley and Sellon showed that, over the period 1987-95, much of the response of interest rates on Treasury securities to monetary policy actions was anticipated well in advance of the policy action. In particular, one reason longer-term interest rates showed little response to changes in the federal funds rate target was because the policy action was anticipated by financial markets several months before the policy decision. Research by Hsu and Kugler and by Lange, Sack, and Whitesell went further and showed that the ability of financial markets to predict future policy actions improved considerably in the late 1980s and early 1990s as compared to the early 1980s.

Interestingly, the improvement in policy predictability found in these studies began prior to the steps toward greater transparency that began in 1994. One explanation for this finding is that Federal Reserve

behavior became more predictable to financial markets even before the move toward greater formal transparency.

A number of recent studies have used information from the federal funds futures market to examine whether financial markets have shown evidence of improved policy predictability since the Federal Reserve's move toward greater transparency in 1994 (Kuttner, Poole, Rasche, and Thornton; Lange, Sack, and Whitesell, Swanson). This literature has focused on two issues: how well financial markets can predict a future policy action and how far in advance markets are able to anticipate policy actions.

These studies have shown a dramatic decline in the number and size of "policy surprises" in the post-1994 period. For example, Lange, Sack, and Whitesell note that from 1989 to 1993 nearly 60 percent of a change in the federal funds rate came as a surprise to financial markets.³ In contrast, from 1994 to 2000, the policy surprise fell to only 24 percent. A large part of this reduction can be directly traced to the Federal Reserve's greater propensity to make policy decisions at regularly scheduled meetings since, as noted by Poole and Rasche, intermeeting policy actions are more likely to surprise financial markets.

While this research finds improvement in short-term policy predictability, it also suggests that the empirical results may be sensitive to the choice of sample period. For example, Swanson found that prediction errors from the federal funds futures market trended down from 1988 to 2003 and were considerably lower post-1994. However, the improved forecasting was not uniform. Indeed, he noted that short-term prediction errors and policy surprises, after declining from 1994 to 2000, increased considerably from 2001 to 2003. Swanson attributed this decline in forecast accuracy to the difficulty of forecasting policy during a period in which the policy instrument was changing rapidly.

Data for a more recent time period (2003-07) show even greater improvement in financial markets' ability to predict monetary policy. For example, Kwan found considerable improvement in short-term predictability at both one-month and six-month forecasting horizons. Indeed, at a one-month forecast horizon, he found that federal funds rate prediction errors declined from 15 basis points from 1989 to 1993 to seven basis points from 1994 to 2003 and to only two basis points from 2003 to 2007. Similarly, at a six-month horizon, Kwan found that

prediction errors declined from 80 basis points from 1989 to 1993, to 48 basis points from 1994 to 2003, and to 21 basis points from 2003 to 2007. Interestingly, the federal funds rate target was also changing rapidly during much of the 2003-07 period. As we will discuss later, however, in this period the Federal Reserve provided more information about the future short-run path of policy that may have enabled markets to produce better forecasts.

Finally, in comparing the pre-1994 period with a sample from 1999 to 2006, Carlson, Craig, Higgins, and Melick found improved forecast accuracy and fewer policy surprises. These authors also looked at how far in advance markets can accurately predict policy actions. They found improvement over time horizons from one day to 90 days prior to an FOMC meeting, with the largest improvement occurring at the longer horizons.

One important question about this evidence of improved policy predictability is whether the improvement is due to greater monetary policy transparency or to other factors. For example, over the last 20 years, the volatility of real GDP growth has declined sharply, while inflation rates have been lower and less volatile. Thus, it is possible that markets' increased ability to predict future policy actions may have resulted from improved forecasting of the economy rather than greater knowledge of monetary policy objectives and procedures. In addition, it has been claimed that during the Greenspan era, future policy actions were sometimes leaked to financial markets prior to an FOMC meeting, resulting in fewer policy surprises.

Swanson examines both of these alternative explanations and finds them lacking. Using data from the Blue Chip Consensus forecasts, he finds that private sector forecasts of real GDP and inflation from 1991 to 2003 did not improve to the same extent as forecasts of short-term interest rates. Swanson also finds that the improvement in interest rate forecasts extends beyond the next FOMC meeting, suggesting that information leaks prior to an FOMC meeting are not the main factor driving increased policy predictability.

III. SURVEY EVIDENCE ON MONETARY POLICY PREDICTABILITY

Although recent research suggests that financial markets' ability to forecast monetary policy has improved as policy transparency has in-

creased, most studies have focused on relatively short forecast horizons. Evidence on policy predictability at longer horizons is more difficult to obtain, in part because futures markets tend to be less liquid at longer horizons and it becomes more difficult to extract policy expectations from other factors that might influence market interest rates. An alternative approach is to use survey evidence on monetary policy expectations. This article uses information from the Blue Chip Financial Forecasts to obtain estimates of the expected future monetary policy path. Analysis of the forecast errors from the Blue Chip survey confirms improvement at short-term horizons but shows much less improvement at longer horizons. A more detailed study of the forecast errors from the Blue Chip survey reveals significant asymmetries in the forecast errors in periods in which policy is changing, with important implications for the Federal Reserve's leverage over longer-term interest rates.

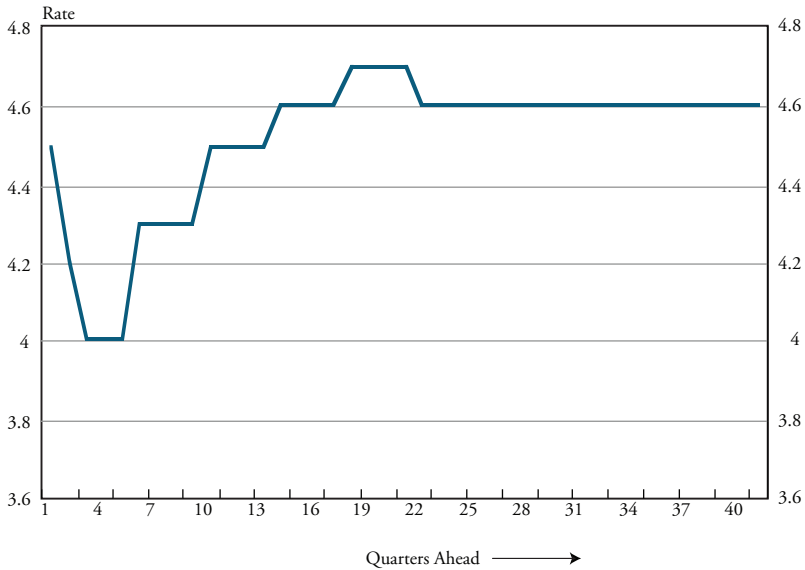
Survey evidence on policy expectations

The Blue Chip survey, published monthly, contains short-term forecasts for interest rates for the next five quarters. Twice a year, however, the regular survey is supplemented by a series of longer-range forecasts for interest rates—including the federal funds rate—out to a horizon of ten years. For example, survey respondents are asked for their forecast of the average federal funds rate for each of the next five years and then the expected five-year average for the federal funds rate for the period five to ten years ahead. By combining this information on longer horizons with the regular five quarter forecasts, it is possible to construct an expected federal funds rate path over the next ten years.

The expected policy path constructed from a recent Blue Chip survey, taken in November 2007 and reported in the December 2007 edition of Blue Chip Financial Forecasts, is shown in Chart 1.⁴ According to this path, survey participants expected the existing 4.5 percent federal funds rate to be reduced to 4.2 percent in the first quarter of 2008 and to 4 percent in the second quarter. Participants then expected the rate to be raised beginning in 2009, reaching a long-run average of 4.6 percent in 2011. Since the federal funds rate was lowered to 3 percent in January 2008, survey participants clearly judged the direction of the short-run policy change correctly but were far off in terms of the magnitude of the policy change. This short-term prediction error is

Chart 1

EXPECTED FEDERAL FUNDS RATE PATH



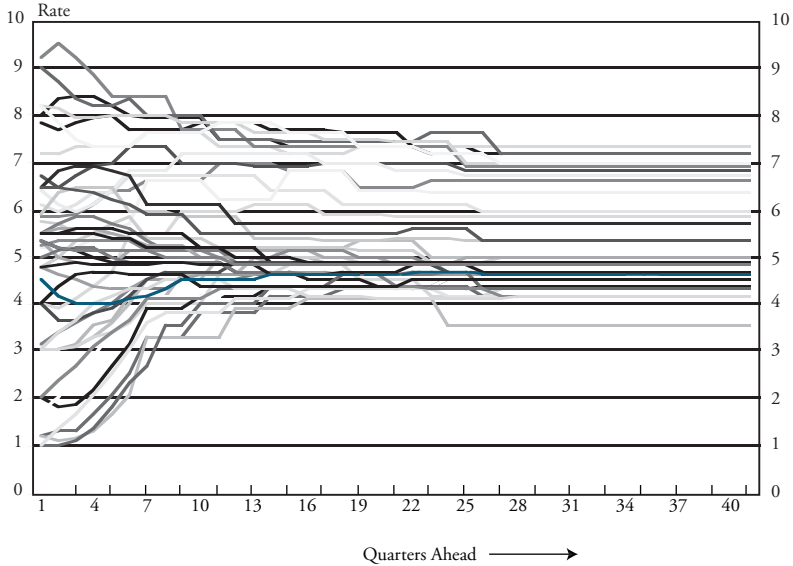
considerably larger than suggested by the empirical studies cited earlier but is, as we will see, quite consistent with similar episodes in the past when policy was eased rapidly.

Policy paths for each survey date from 1986 to 2007, constructed along the lines of Chart 1, are shown in Chart 2, with the November 2007 path highlighted in blue. These paths have a number of interesting properties. The expected federal funds rate shows a clear tendency to revert to its long-run value in about three years. This pattern is consistent with what might be generated by a Taylor rule, where a central bank alters the target interest rate in the short run to respond to output and inflation gaps but then returns the policy rate to neutral over time.

A second interesting feature of the policy paths shown in Chart 2 is that the long-run expected funds rate is not constant but moves around over time. In fact, from 1986 to 2007, the long-run expected federal funds rate in the Blue Chip survey declined from around 7.2 to 4.6 percent (Chart 3). Much of this decline appears to be due to a reduction in long-run inflation expectations, which fall from 4.4 to 2.3 percent in the Blue Chip surveys taken over this period.

Chart 2

EXPECTED FEDERAL FUNDS RATE PATHS BLUE CHIP FINANCIAL SURVEY 1986-2007



Analysis of survey forecast errors

These policy paths can be used to examine how accurate survey participants were at various forecast horizons. In the analysis, we look at forecast errors at horizons of one, two, four, and eight quarters ahead. At each horizon, the forecast error is the difference between the average federal funds rate in the quarter minus the expected funds rate for that quarter from the survey.⁵

Absolute errors for forecast horizons of one, four, and eight quarters are shown in Chart 4, with the two-quarter horizon omitted for clarity. Errors are clearly much smaller for the one-quarter horizon and have shown some tendency to decline over time, especially since 2003. Errors for the four- and eight-quarter horizons are considerably larger and do not appear to have declined over time. Interestingly, the largest errors at the four- and eight-quarter horizons appear to occur during periods in the early 1990s and early part of this decade when policy was eased considerably. These errors are much larger than those occurring during periods when policy was tightened, such as 1994, 1999-2000, and 2004-06. The relationship between forecast errors and the stance of monetary policy will be explored in more detail later.

Chart 3

LONG-RUN EXPECTED FEDERAL FUNDS RATE
BLUE CHIP FINANCIAL SURVEY

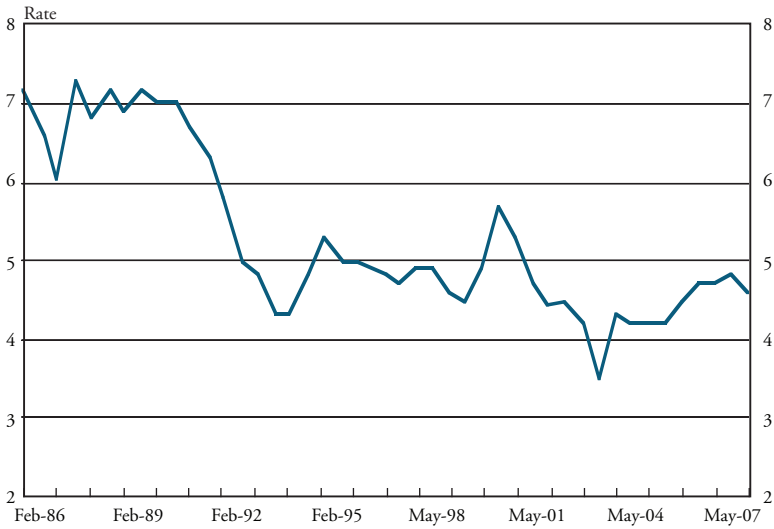
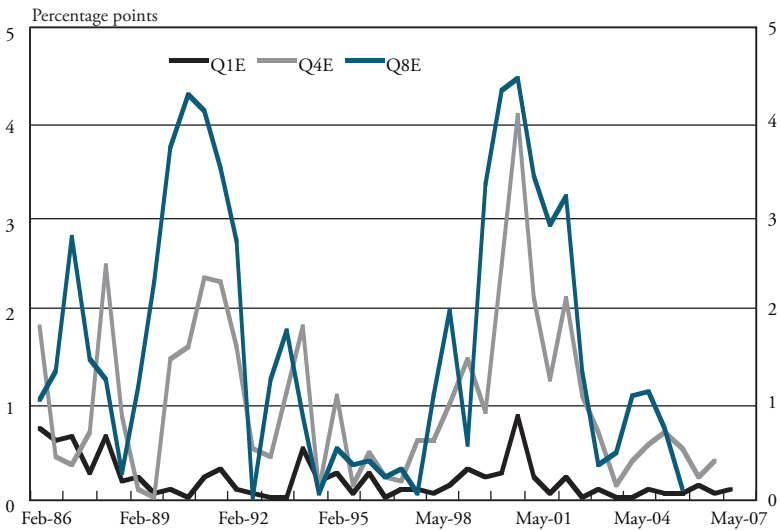


Chart 4

ABSOLUTE FORECAST ERRORS
BLUE CHIP FINANCIAL SURVEY



To determine whether survey forecasts have improved over time and whether they depend heavily on the choice of sample period, we show the mean absolute forecast errors and standard deviation for several sample periods in Table 2. There is some evidence that errors are smaller after 1994, especially at the one-quarter and eight-quarter horizons. However, when the sample after 1994 is split at 2003, it is clear that the post-1993 improvement can be attributed almost entirely to the most recent period from 2003 to 2007. Errors during this period are remarkably lower at all forecast horizons, as are standard deviations.

A more formal analysis of these forecast errors can be performed, as Swanson did, by looking at whether short-term errors showed a downward trend as transparency increased and determining whether these errors were significantly different in the pre- and post-1994 periods. Table 3 reports regressions of forecast errors at all four horizons separately on a time trend, a post-94 dummy variable, and a post-2002 dummy variable. Looking first at the regressions with the time trend, there is support for a reduction in forecast errors only at the one-quarter horizon, as the time trend is not significant at the other horizons. Interestingly, and in contrast to Swanson, the post-94 dummy is not significant at any forecast horizon, suggesting that forecasting performance in the survey forecast did not improve sharply after 1994. However, the post-2002 dummy is significant at all four horizons. Taken as a whole, these results suggest improvement over time in the survey forecasts for short-term horizons and substantial improvement at all horizons in the 2003-07 period.⁶

As noted above, compared with other studies of short-term forecasts, the break in the sample at 1994 does not appear to be statistically significant. The difference in these results appears due to the relatively larger errors in forecasts using federal funds futures data in the pre-1994 period, as reported in other studies (Swanson, Kwan). In contrast, the short-term forecast errors in the Blue Chip Survey are smaller than the futures forecasts in this early time period, which may account for the much sharper improvement in post-1994 accuracy using federal funds futures data.⁷

Patterns in forecast errors: Implications for leverage over long-term rates

As noted earlier, Swanson and others have found a pattern in the federal funds rate forecast errors, with larger errors when the federal

Table 2

**SURVEY FORECAST ERRORS OVER ALTERNATIVE
SAMPLE PERIODS
MEAN, ABSOLUTE ERROR, AND (STANDARD DEVIATION)**

Period	Q1 Error	Q2 Error	Q4 Error	Q8 Error
1986-2007	.21 (.22)	.52 (.48)	1.05 (.87)	1.67 (1.40)
1986-1993	.27 (.26)	.60 (.50)	1.14 (.82)	2.07 (1.33)
1994-2007	.18 (.19)	.47 (.47)	.99 (.91)	1.40 (1.41)
1994-2002	.23 (.21)	.58 (.54)	1.22 (1.02)	1.64 (1.55)
2003-2007	.07 (.04)	.24 (.16)	.47 (.20)	.66 (.42)

Table 3

**ANALYSIS OF SURVEY FORECAST ERRORS
(NEWBY-WEST S.E)**

	Constant	Time Trend	Post-94 Dummy	Post-2002 Dummy
Q1 Error	.367 (.095)	-.007 (.003)	-----	-----
	.270 (.090)	-----	-.094 (.102)	-----
	.247 (.045)	-----	-----	-.173 (.047)
Q2 Error	.714 (.134)	-.009 (.006)	-----	-----
	.595 (.128)	-----	-.126 (.172)	-----
	.589 (.094)	-----	-----	-.348 (.101)
Q4 Error	1.162 (.271)	-.005 (.012)	-----	-----
	1.142 (.228)	-----	-.153 (.342)	-----
	1.182 (.203)	-----	-----	-.712 (.209)
Q8 Error	1.915 (.557)	-.012 (.024)	-----	-----
	2.07 (.458)	-----	-.678 (.637)	-----
	1.844 (.375)	-----	-----	-1.18 (.460)

funds rate is changing rapidly as the Federal Reserve eases or tightens policy. This pattern is also present in the Blue Chip survey forecast errors, but with two additional interesting features. In the Blue Chip survey, there is an asymmetry in the forecast errors, with larger errors when policy is being eased than in periods of tightening, especially for longer-horizon forecasts. In addition, there is some evidence that forecast errors have been reduced over time during periods of tightening. In contrast, forecast errors during periods of policy easing have not improved significantly.

These points are illustrated in Charts 5-7, which show survey forecast errors for the one-, four-, and eight-quarter horizons overlaid on periods in which the federal funds rate was being raised (light-shaded) or lowered (dark-shaded). For each survey date, the error is calculated as the actual federal funds rate one, four, and eight quarters ahead minus the survey expectation for that horizon.

As seen in these charts, there is a general tendency for the forecasts to underestimate future policy actions, resulting in positive errors in tightening periods and negative errors in easing periods.⁸ In addition, during tightening periods, forecasters started out underestimating the degree of tightening that would be forthcoming (positive errors) and then overestimated the amount of tightening that would ultimately occur (negative errors). In easing periods, forecasters initially underestimated the amount of easing and then reduced their errors as time passed. Moreover, for the four- and eight-quarter forecasts, negative errors associated with policy easing appear especially large.⁹ Finally, across the three charts, the peak positive forecast errors appear to have declined somewhat over time, suggesting that forecasters' ability to predict future policy has improved during tightening periods, with much of this improvement coming from the 2003-06 period. In contrast, peak negative errors have not shown the same decline, suggesting less improvement during easing periods.

We can obtain more insight into the nature of these forecast errors by looking more closely at the evolution of the Blue Chip survey estimates of the expected policy path. Charts 8 and 9 show the evolution of the federal funds rate and the Blue Chip forecasts of the expected policy path during the easing and tightening cycle of 1989 to 1994 and the easing and tightening cycle of 2000 to 2004. In the charts, the black line shows how the federal funds rate evolved, while the other lines show the evolution of the expected policy path.

Chart 5
ONE-QUARTER FORECAST ERRORS AND POLICY STANCE

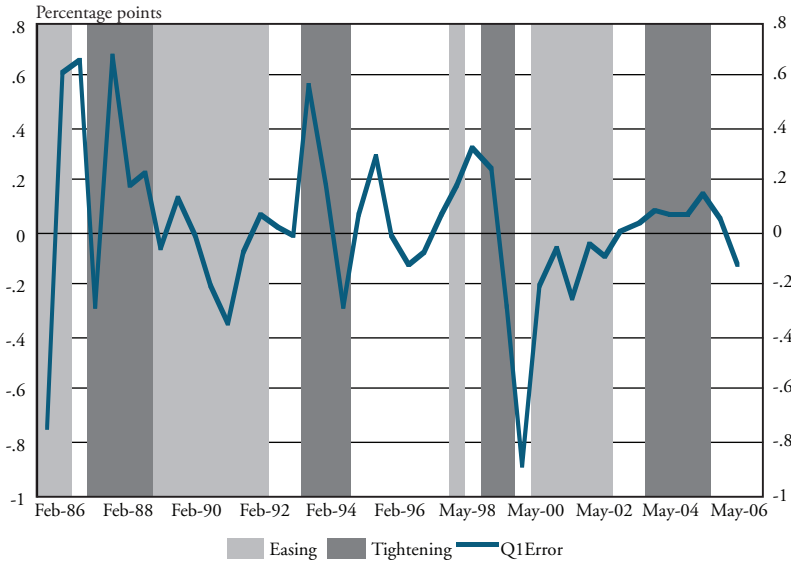


Chart 6
FOUR-QUARTER FORECAST ERRORS AND POLICY STANCE

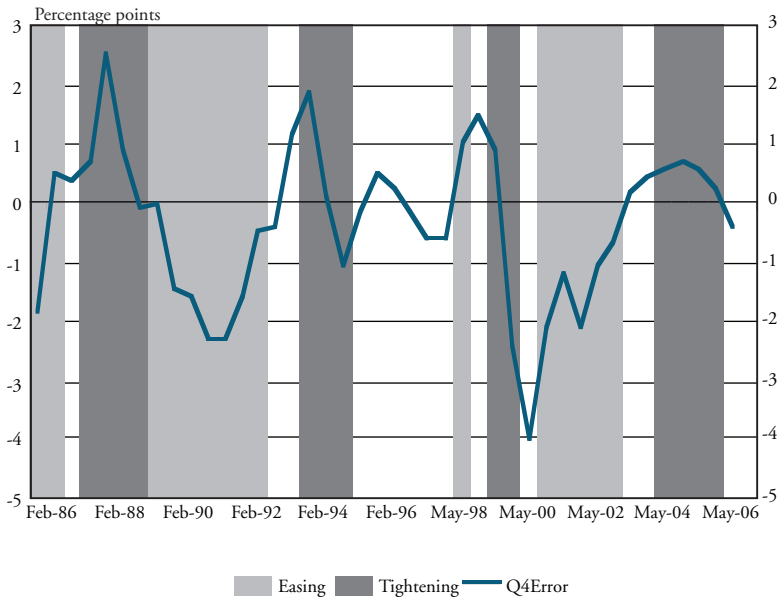


Chart 7
EIGHT-QUARTER FORECAST ERRORS AND POLICY STANCE

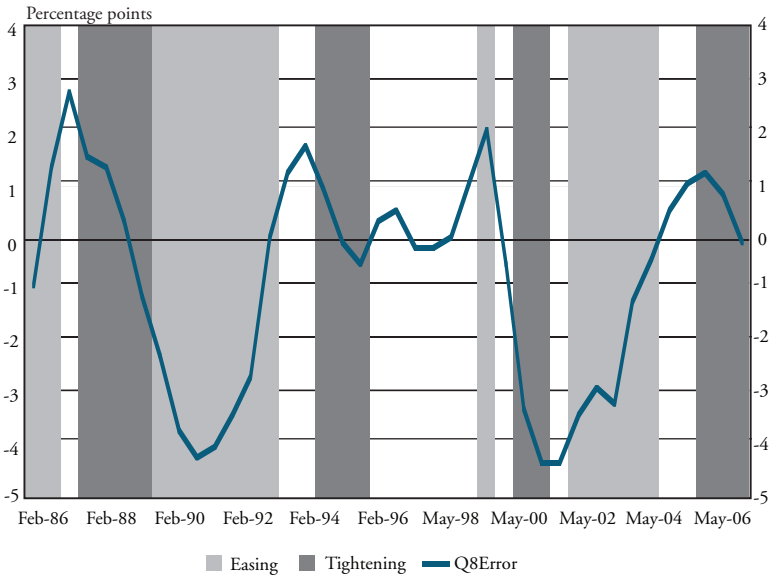


Chart 8
BLUE CHIP POLICY PATHS 1990-95

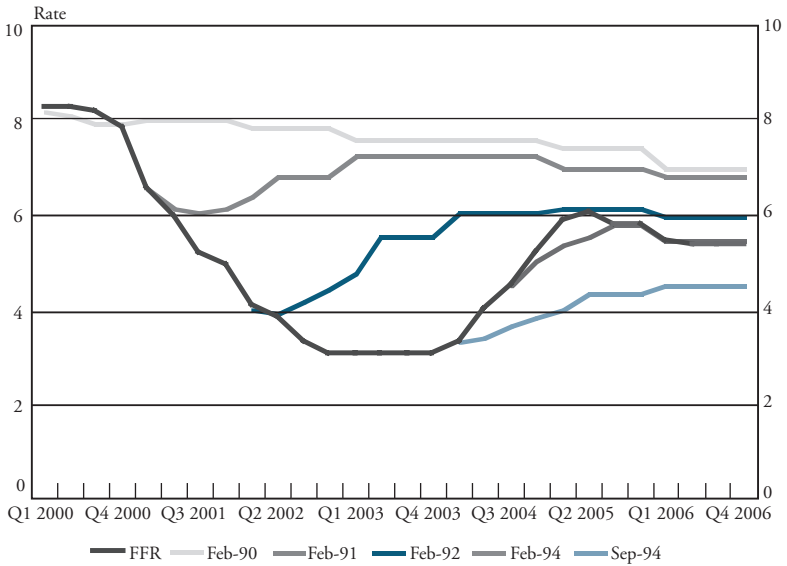
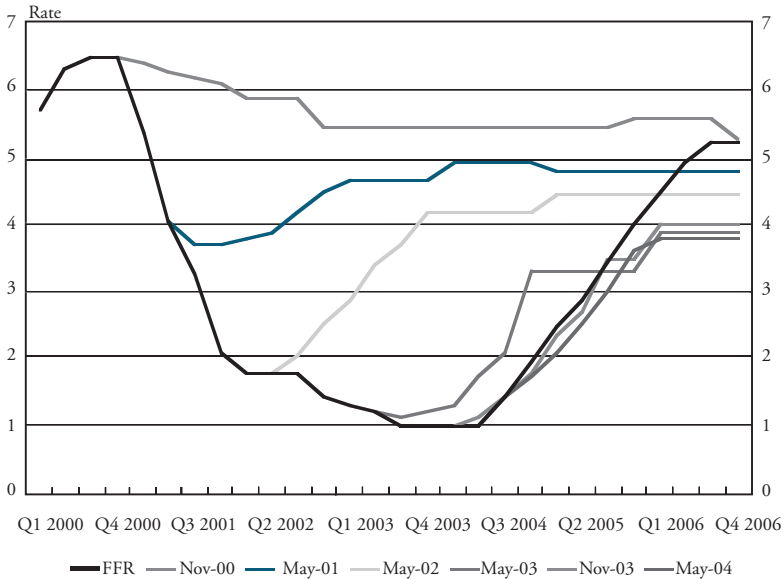


Chart 9
BLUE CHIP POLICY PATHS 2000-04



Looking first at Chart 8, in the Blue Chip survey taken in February 1990 forecasters expected a very gradual reduction in the federal funds rate over the next several years. After the 1990-91 recession, the funds rate was reduced from around 8 percent to a low of 3 percent in 1992. As shown in the chart, however, forecasters continually underestimated the amount of future easing and thought the Federal Reserve would tighten policy much more quickly than turned out to be the case. Then, in 1993 and the beginning of 1994, forecasters significantly underestimated the path of policy tightening that began in February 2004.

Chart 9 shows similar information on the actual federal funds rate path and the expected policy path from the Blue Chip survey for the period 2000-04. In November 2000, with the federal funds rate at 6.5 percent, forecasters anticipated a very gradual reduction in the funds rate over the next few years. As noted earlier, the dramatic drop in the funds rate during 2000 and 2001 led to extremely large errors at all forecast horizons. As time passed, forecasters lowered their estimates of the future funds rate path as the actual funds rate was reduced but continued to expect a rapid tightening of policy, which finally occurred in June 2004.

Interestingly, as discussed earlier, forecasters were much better able to anticipate the tightening of policy when it finally occurred in 2004, in part, perhaps, because of the greater guidance provided by the FOMC in its policy statements. Indeed, as shown in Chart 9, by November 2003, forecasters were able to accurately predict the policy path over the next two years, in sharp contrast to the large errors at the beginning of the 1994 tightening period. Taken together, these two charts illustrate the continuing difficulties that forecasters have in judging the extent and timing of policy easing and the striking improvement that occurred in the 2004-06 tightening period.

Understanding the evolution of the expected policy path as shown in these two charts also provides some insight into the Federal Reserve's leverage over longer-term interest rates. Charts 10 and 11 show what happened to the ten-year Treasury rate as the federal funds rate target changed during these periods.

Interesting similarities appear in the behavior of the long-term rate in the two easing periods. In both periods, the Federal Reserve made sharp reductions in the federal funds rate target at the beginning of the easing cycle. However, in both periods, long-term rates did not fall until much later in the easing cycle. Part of the explanation for the sluggish response in long-term rates can be found in the behavior of the expected policy paths in Charts 8 and 9. In both periods, forecasters anticipated little further easing and, indeed, believed that the Federal Reserve would begin raising rates back to neutral fairly rapidly. This likely prevented a larger decline in long-term rates.¹⁰

In contrast to the easing periods, long-term rates responded very differently in the 1994 and 2004 tightening episodes. As seen in Charts 10 and 11, long-term rates moved up sharply at the beginning of the tightening cycle in 1994 but moved very little when tightening began in 2004. Once again, the expected policy path provides insight into these differences. As seen in Chart 8, in 1994, forecasters were initially surprised at the timing and magnitude of tightening. Expectations adjusted very quickly, however, and forecasters raised their estimate of the policy path. Moreover, they believed that the increase in the funds rate target was likely to be permanent rather than temporary, leading to a sharp increase in long-term rates. In contrast, in 2004, the expected policy path initially built in a relatively accurate estimate of the actual

Chart 10
BEHAVIOR OF LONG-TERM RATE 1990-95

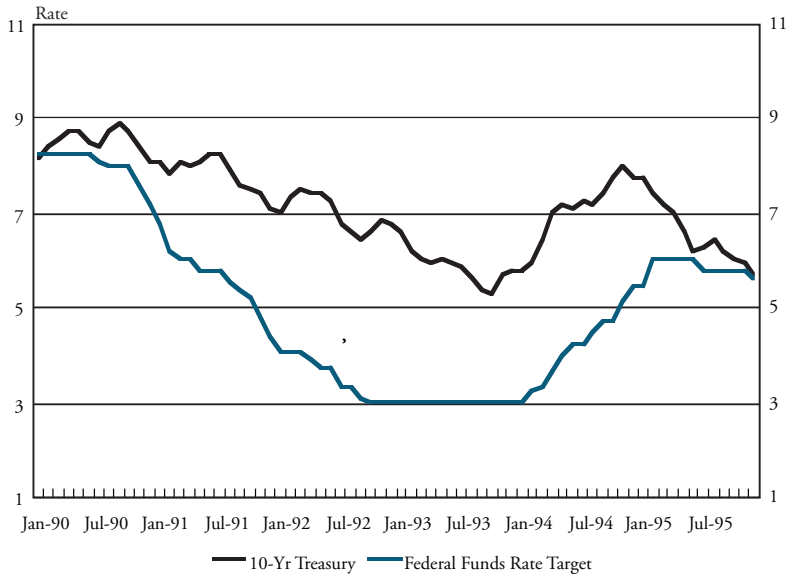
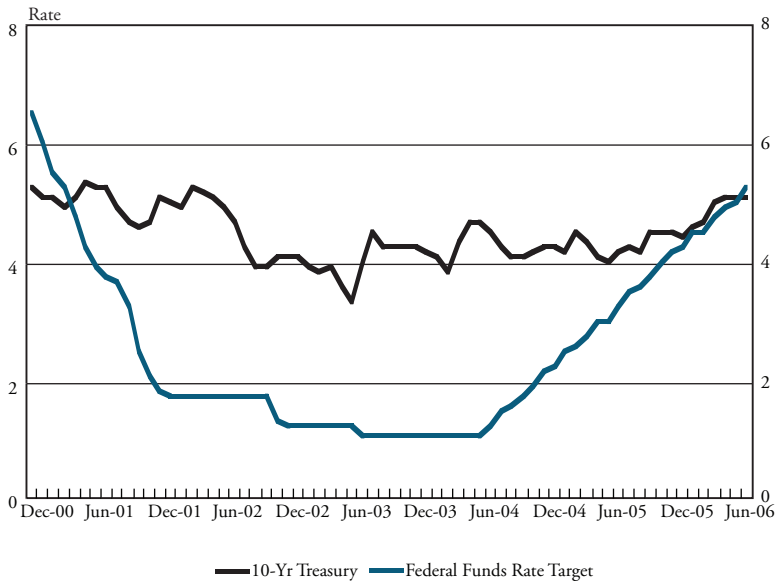


Chart 11
BEHAVIOR OF LONG-TERM RATE 2000-06



funds rate path, so that forecasters were not surprised at the timing and pace of tightening.¹¹ This likely contributed to the smaller increase in long-term rates during this period.¹²

III. SUMMARY AND CONCLUDING COMMENTS

This article has examined whether private sector forecasts of monetary policy have improved in recent years as the Federal Reserve has taken steps to increase the amount of information it provides to the public. The article uses information from the Blue Chip Financial Forecasts to look at the accuracy of forecasts of the federal funds rate over horizons from one quarter to two years ahead. For short-term forecast horizons, forecast accuracy has clearly improved, a finding similar to that of other studies using data from the federal funds futures market. There is less evidence of improvement at longer forecast horizons of one to two years ahead. At all horizons, however, much of the improvement came from 2003 to 2006, when the Federal Reserve provided an unusual amount of guidance about likely future policy actions.

The article also finds interesting patterns to the survey forecast errors. As in other studies, most errors occur at turning points in the economy and when the Federal Reserve is actively changing policy. In particular, forecast errors are considerably larger at longer horizons for periods in which policy is eased. Moreover, forecast errors during periods of policy tightening appear to have diminished over time, while little improvement is seen during periods of policy easing. Put differently, forecasters seem to have become much better at judging the amount and timing of policy tightening—but less so at judging the amount and timing of policy easing.

Interestingly, a sharp demarcation in forecasting performance did not appear in 1994, when the FOMC began announcing policy changes and issuing press statements after committee meetings. This suggests that improved forecasting performance is most likely due to the cumulative effects of formal steps toward greater transparency, combined with more predictable behavior on the part of Federal Reserve policymakers.

ENDNOTES

¹The central banks of New Zealand, Norway, and Sweden provide numerical projections of their policy interest rates as part of the forecast information released to the public.

²For example, beginning with its press statement on August 12, 2003, the FOMC indicated that “policy accommodation can be maintained for a considerable period,” a phrase that was repeated for the next three meetings. Similarly, in its statement on May 4, 2004, the FOMC indicated that “policy accommodation can be removed at a pace that is likely to be measured,” a phrase that was repeated for the next 12 meetings.

³The policy surprise is calculated as the difference between the actual funds rate on the day of a policy action and the funds rate expected on that day as derived from federal funds or Eurodollar futures. Computing the expected federal funds rate from futures data is somewhat complicated. See Kuttner (pp. 525-30) for details.

⁴The Blue Chip Financial Forecasts are released at the beginning of a month and are based on a survey taken at toward the end of the previous month.

⁵While longer horizons could be considered, they would effectively exclude the period since 2003 that is of particular interest.

⁶With the small sample sizes of the Blue Chip long-term survey, there may be some concern that a few observations could be especially influential and distort the underlying relationships. As seen in Chart 3, there was a very large forecast error in November 2000 shortly before the FOMC eased policy rapidly prior to the 2001 recession. When this observation is removed from the estimates shown in Table 2, the time trend is significant at both the one-quarter and two-quarter forecast horizons but not at the longer horizons. The other results in Table 2 are not changed in a material way. Thus, this further analysis strengthens the result that the improvement in short-run forecast accuracy found in studies using futures data is also present in the Blue Chip survey.

⁷When the Blue Chip forecasts and federal funds futures forecasts are made on a comparable basis for a one-quarter forecast horizon, in the pre-1994 period, the mean absolute error from fed funds futures forecasts is 23 basis points, while the Blue Chip error is 17 basis points. Post-1994, the one-quarter forecast errors are essentially identical (10 basis points). The change in the forecast error for the federal funds futures data is statistically significant, but the change in the Blue Chip survey is not. While it may be surprising that survey forecast errors should be smaller than forecasts from futures data prior to 1994, the difference is likely due to the lack of liquidity in the futures markets in the first few years of their operation. This also suggests, however, that the federal funds futures data may not be reliable in the pre-1994 period.

⁸The large positive error at the eight-quarter forecast horizon in Chart 7 during the easing period in the fall of 1998 is a reflection of the fact that forecasters did not expect the significant tightening of policy that occurred in 1999 and 2000. Indeed, in the fall of 1998 and spring of 1999, the Blue Chip forecasts suggested that the Federal Reserve would maintain rates low for an extended period of time.

⁹A more detailed analysis of the errors during easing and tightening periods compared with periods of no policy change indicates that errors in tightening periods are not statistically different from errors in no policy change periods at any forecast horizon. In contrast, errors in easing periods are significantly different from errors in no policy change periods at both the four- and eight-quarter horizons.

¹⁰The bigger influence on long-term rates during this period appears to be a reduction in long-term inflation expectations as actual inflation declined over the period. A reduction in inflation expectations is consistent with the decline in the expected long-run equilibrium funds rate observed in Charts 3, 8, and 9.

¹¹Excerpts from the minutes of the May 2004 meeting illustrate the concern that FOMC members had about a sharp rise in long-term rates when tightening began: “The Committee focused instead on a formulation that would emphasize that policy tightening, once it began, probably could proceed at a pace that would be ‘measured.’ A number of policymakers were concerned that such an assertion could unduly constrain future adjustments to the stance of policy should the evidence emerging in coming months suggest that an appreciable firming would be appropriate. Others, however, saw substantial benefits to inclusion of the proposed language. These members noted that current economic circumstances made it likely that the process of returning policy to a more neutral setting would be more gradual, once under way, than in past episodes when inflation was well above levels consistent with price stability.”

¹²In addition, long-term rates appear to have been held down during this period by a decline in inflation expectations and by a reduction in the term premium. For more details, see Kozicki and Sellon.

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