Research Program on Forecasting

Has the Fed's Forecasting Advantage Eroded?

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Has the Fed's Forecasting Advantage Eroded?

Abstract: We examine the relative improvement in forecasting accuracy of the Federal Reserve (Greenbook forecasts) and private-sector forecasts (the Survey of Professional Forecasters and Blue Chip Economic Indicators) for inflation. Previous research by Romer and Romer (2000), and Sims (2002) shows that the Fed is more accurate than the private sector at forecasting inflation. In a separate line of research, Atkeson and Ohanian (2001) and Stock and Watson (2007) document changes in the forecastability of inflation since the Great Moderation. These works suggest that the Great Moderation was mostly due to a decline in the variability of the predictable component inflation. We hypothesize that this drop has evened the playing field between the Fed and private sector and therefore led to an erosion, if not disappearance, of the Fed's relative forecasting advantage. We test this hypothesis and find that the Fed's relative forecasting advantage with respect to inflation has eroded, especially after the Fed moved toward greater transparency starting in 1994.

"…I've been in the forecasting business for 50 years. … I'm no better than I ever was, and nobody else is. Forecasting 50 years ago was as good or as bad as it is today. And the reason is that human nature hasn't changed. We can't improve ourselves."

Alan Greenspan, the Daily Show with Jon Stewart, Tuesday, September 18, 2007.

1. Introduction

Since 1994 the Federal Reserve has moved toward greater transparency and openness. One area that remains less-than-transparent, however, is the Fed's Greenbook which contains the economic forecasts that help guide Fed policy. Currently Greenbook forecasts are available with a 5-year lag. [1] Recently some economists (see Geraats (2001)) have argued that greater central bank transparency necessarily includes timely release of forecasts. As the Federal Reserve contemplates inflation targeting, it is likely that one consideration is whether to follow the central banks of England and Canada by releasing inflation forecasts. But some economists (Cukierman (2001, 2007), Ferguson (2002), and Gersbach (2003)) argue that releasing FOMC forecasts could be destabilizing. A central tenet of the non-release argument is that the Fed's forecasts contain information that is not contained in private sector forecasts.

There is empirical support for the idea that Fed forecasts contain information not contained in private-sector forecasts. Romer and Romer (2000), and Sims (2002), for example, find that the Fed is better than the private sector at forecasting inflation. Independently of those studies, there have been a number of studies showing that the

[1] On Tuesday November 20, 2007 the Fed began releasing its FOMC forecasts 4 rather than 2, times per year. The Greenbook forecasts, which we study in this paper, differ from the FOMC forecasts. The Greenbook forecasts are prepared by the research staff of the Board of Governors about 3 workdays prior to each FOMC meeting. The FOMC forecasts are a summary (reported as a range and central tendency) of the forecasts produced by the 12 regional Federal Reserve Banks. See Gavin and Mandal (2001) for a comparison of FOMC and private-sector forecasts.

economy experienced a Great Moderation starting around the mid-1980s[2]. Coinciding with that Great Moderation, the forecastability of the economy has changed as well. The overall volatility of inflation has dropped, and therefore, in one sense, it is easier to forecast. But the bulk of that drop in volatility appears to have come from a drop in the volatility of the predictable components of inflation (Atkeson and Ohanian (2001), Stock and Watson (2007)). As a result, the marginal contribution of forecasters has dropped sharply since the mid-1980s. Referring to the post-1984 period, Stock and Watson (2007, p. 4) state "it has become much more difficult for an inflation forecaster to provide value added beyond a univariate model."

We hypothesize that the changes in inflation forecastability that coincided with the Great Moderation and greater transparency since 1994 have caused the Fed's forecasting advantage to decline. To the extent that the Fed had an advantage in forecasting prior to the Great Moderation, that advantage was (obviously) limited to the predictable component of inflation. We therefore hypothesize that the decline in the volatility of the predictable component of inflation has lead to a decline in the Fed's forecasting advantage as well.

We test this hypothesis by comparing the Federal Reserve's Greenbook forecast errors to two sets of private-sector forecast errors: The Survey of Professional Forecasters (SPF) and the Blue Chip Economic Indicators (BC) as well as a naïve forecast represented by the lagged value of inflation. We find that the Fed's relative forecasting advantage with respect to inflation has eroded, especially since the mid-1990s,

[2] Although most studies focus on the decline in output variability (see Bernanke (2004), McConnell and Perez-Quiros (2000), Kim, Nelson, Piger (2004), Stock and Watson (2003) and Blanchard and Simon (2001)) Kahn, McConnell and Perez-Quiros (2002) find a break in inflation volatility in the mid-1980s as well.

but their forecast errors still appear to be slightly smaller than the private sector's. In comparison to the naïve forecast, the Fed's forecasting advantage disappeared at horizons 0-3 and remains only marginally significant at horizon 4 after 1994.

Our paper proceeds as follows. Section 2 reviews the related literature. Section 3 describes our data. Section 4 compares the Fed's root mean squared forecast errors (RMSE) over various sub-samples with the RMSEs from the private sector and naïve forecasts. Section 5 compares the *relative size* of forecast errors between the Fed and the private sector as well as the Fed and the naïve forecast over various sub-samples. Section 6 looks at whether the Fed forecasts contain information not contained in private sector and naïve forecasts. Section 7 presents results from an endogenous break point test in the gap between Fed and private sector forecasts. Section 8 concludes.

2. Related Literature

Using data spanning the late 1960s through the early to mid 1990s, Romer and Romer (2000) and Sims (2002) show that the Federal Reserve is "better" at forecasting inflation[3]. By "better" they mean specifically: 1) the Fed's Greenbook forecasts have lower root mean squared errors (RMSE) than the private sector and 2) given the Fed's Greenbook forecast, private sector forecasts have little or no additional explanatory power for inflation.

[3] Romer and Romer (2000) and Sims (2002) also look at the Fed's forecast errors for real output growth. The Fed's advantage in terms of real output growth forecasts appears to be smaller and less robust across forecast horizons. In an earlier version of this paper we examined the Fed's real output growth forecast errors and found similar results: the Fed did not have a clear forecast advantage across all forecast horizons prior to the Great Moderation. Therefore, the contrast between the Fed's relative forecast advantage pre and post Great Moderation is smaller. These results are available from the authors upon request.

Romer and Romer (2000, p. 437) attribute the Fed's forecasting advantage to the fact that the "Federal Reserve commits far more resources to forecasting than even the largest commercial forecasters." Similarly, Sims' (2002) results are consistent with the hypotheses that the Fed's forecasting advantage arises from the Fed having knowledge of its own likely policy actions and from the Fed being better at collecting detailed information about price developments.

In a separate line of research, Atkeson and Ohanian (2001) and Stock and Watson (2007) examine changes in the forecastability of inflation after the onset of the Great Moderation in the mid-1980s. Atkeson and Ohanian find that the coefficient on unemployment in the short run Phillips curve is significantly negative over the sample 1960-1983. After 1983 they find that the coefficient on unemployment in the short run Phillips curve drops to zero implying that inflation is best forecasted with a random walk model. Stock and Watson find that inflation has become both easier and more difficult to forecast. Inflation has become easier to forecast in the sense that the overall volatility of inflation has dropped and therefore so have RMSEs produced by univariate as well as Phillip-curve type forecasting models. But the relative improvement in RMSEs across these two types of models is striking. In the post-1984 sample, univariate forecasting models perform just as well as Phillips-curve models, suggesting that in the post-1984 period it is difficult for a forecaster to improve upon a simple univariate forecasting model.

3. Data

In the empirical work that follows we compare the forecast errors from the Fed's Greenbook to the forecast errors generated by the median forecast from the SPF, the mean forecast from the BC and the naïve forecast. [4] The naïve forecast is simply the lagged value of inflation. The Greenbook forecasts are available monthly from 1968.11 through 1980.12 and eight times a year from 1981.01 through 2001.12 for a total of 317 observations. The SPF data are quarterly beginning in 1968.04 and continuing through the end of the Greenbook sample 2001.04 for a total of 133 observations. The BC data are available monthly from 1980.01 through 2001.12 for a total of 264 observations. All forecast errors are defined as "actual" minus the forecasted value where actual is the 45-day or second release of the relevant measure the price level.[5,6] We consider forecast horizons 0 through 4 quarters ahead as well as the average of all 5 forecast horizons which we call horizon 0-4.

In all of our forecast error comparisons we are interested in comparing the errors generated by different forecasters for identical quarters.[7] For example, in comparing the BC with the Fed, we consider only those forecasted quarters for which both sets of

[4] Blue Chip Economic Indicators defines the consensus as the mean of a group of forecasts. The SPF forecasts are available from the Federal Reserve Bank of Philadelphia web-site (http://www.philadelphiafed.org/econ/spf/index.cfm). The historical data on The Blue Chip Economic Indicators were purchased from Aspen Publishing Company.

[5] We use the GNP price deflator prior to 1992. Between 1992 and 1996 we use the GDP implicit price deflator and after 1996 we use the GDP price index . All real time data were obtained form the St. Louis Federal Reserve Web-site (http://alfred.stlouisfed.org/)

[6] We use the 45-day or second release data because it is the most consistently measured series over our entire sample. See Sinclair, Stekler and Kitzinger (2006). We obtained nearly identical results in an earlier version of this paper using BEA's 75-day or third release (also called first final) data.

[7] We arrange our forecast data as described in Romer and Romer (2000), pp. 431-33. The Greenbook and BC forecasts are aligned with the month that each is published. The SPF forecasts are aligned with the middle month of each quarter.

forecasts exist. The common sample for the BC and the Fed is from 1980.01 through 2001.12 and contains 176 observations. Similarly, in comparing the SPF with the Fed we consider only the forecasted quarters for which both sets of forecasts exist. The common sample for the SPF and the Fed spans 1968.11 through 2001.12 and contains 108 observations.

4. RMSE Comparison

Tables 1 through 3 show the RMSEs for the Fed, SPF, BC and naïve forecasts of inflation over various sub-samples. The full sample is 1968-2001 for the SPF and naïve forecasts and 1980-2001 for the BC[8]. We calculated the RMSE for sample splits at 1984 (pre- and post-Great Moderation, as identified by McConnell and Perez-Quiros (2000)) and 1994 (the date at which the Fed began announcing its policy changes immediately following FOMC meetings). We employed the modified Diebold-Mariano test statistic to test whether the forecast errors (RMSE and absolute value) were different across forecasters and across sample splits.[9]

Comparing inflation forecast errors of the Fed with the SPF, table 1, both the Fed's and the SPF's RMSEs dropped by roughly 50-60% after the onset of the Great

[8] All samples end at 2001 because the Greenbook forecasts are available with a 5-year lag.

[9] According to Harvey, Leybourne and Newbold (1997), the unmodified Diebold-Mariano test statistic is "quite seriously oversized for moderate number of observations." They suggest the following modification which results in an improvement in the behavior of the test statistic for moderately-sized samples:

$$S_1^* = S_1\left(\frac{T+1-2(h+1)+h(h+1)/T}{T}\right)^{-\frac{1}{2}},\ S_1 = \frac{\bar{d}}{[\hat{V}(\bar{d})]^{1/2}}$$

where $\bar{d}$ is the mean difference of the prediction errors and $\hat{V}(\bar{d})$ is the estimated variance. The modified Diebold-Mariano test statistic is estimated with Newey-West corrected standard errors that allow for heteroskedastic autocorrelated errors.

Moderation in the mid-1980s. The Diebold Mariano test statistic is for the null hypothesis that the Fed's RMSE and the SPF's RMSE are identical. In almost all samples and horizons that hypothesis is strongly rejected. The exceptions are for the zero horizon in the pre-Great Moderation (pre-1984) sample and the zero, one and two quarter-ahead forecast horizons in the post-announce sample. For the three and four-quarter ahead forecast horizons the differences between the Fed's RMSE and the SPF's RMSE are only marginally significant. Thus, the results in Table 1 suggest some erosion of the Fed's forecasting advantage after 1994.

Table 2 compares the RMSEs for the Fed and the Blue Chip. The RMSEs for both the Fed and the BC dropped by roughly 20-50% after the mid-1980s. After the onset of the Great Moderation the Fed's RMSEs remained significantly lower than the BC's at horizons 1 through 4 and at the zero horizon the Fed went from having a slightly higher RMSE in the pre-1984 period to having a smaller RMSE (statistically significant) in the post-1984 period[10]. The ratio of the BC's RMSE to the Fed's RMSE dropped after 1984 at horizons 1 through 4. The ratio increased at the zero horizon reflecting the fact that the Fed's RMSE fell by 50% after the Great Moderation and the BC's RMSE fell by only 25%. Comparing the pre-and post-announce periods we see similar declines in RMSEs and in the ratio of RMSEs. With the exception of the zero horizon inflation forecast errors, the ratio of RMSEs dropped after the onset of the Great Moderation and then dropped further in the post-announcement period (post-1994). These results are

[10] The Fed's higher RMSE prior to 1984 does not appear to be due to outliers. In the 1980-1983:12 sample, the Fed's forecast errors exceeded the BC's forecast errors at the zero horizon 64% of the time. In the 1984-2001:12 sample the Fed's forecast errors exceeded the BC's forecast errors at the zero horizon 35% of the time.

consistent with the hypothesis that the Fed's forecasting advantage has eroded. These results also suggest that the erosion continued well beyond the Great Moderation.

Table 3 shows the comparison of RMSE between the Fed and the naïve forecast. For all samples, except the post-1994 sample, the Fed's forecast errors are significantly different from the naïve forecast errors. But the post-1994 sample is a notable exception. After 1994, we fail to reject the null hypothesis that the Fed's forecast errors are identical (on average) to the forecast errors generated by the naïve model, at horizons 0-3. At the 4-quarter ahead horizon the Fed's errors are only marginally significantly smaller than the naïve errors. The results presented in Table 3 suggest that the erosion of the Fed's forecasting advantage relative to the naïve forecast took place well after the onset of the Great Moderation in 1984.

Figures 1 and 2 compare the pre- and post-1994 RMSEs at the various forecast horizons. There are two conclusions that are clear from these figures. First, RMSEs have dropped for the Fed and the private sector forecasters (SPF and BC) and second, the gap between the Fed's RMSEs and the private sectors' RMSEs narrowed after 1994.[11]

5. Relative Forecast Errors

The results presented in tables 1, 2 and 3 are consistent with the hypothesis that the Fed's forecasting advantage has eroded, especially since the mid-1990s. In this section, we directly test that hypothesis by comparing the gap between the Fed and the alternative forecast errors where the alternative is either the private sector (SPF and BC) or the naïve forecast. We define gap_t as follows:

[11] The graphs for the pre and post Great Moderation break point are similar with one exception--the Fed's RMSE was larger than the BC's RMSE in the pre-1984 period. Those figures are available from the authors upon request.

$$gap_t = |\ alternative\ error_t| - |\ Fed\ error_t| \qquad (1)$$

Tables 4 through 6 show the value of gap_t for various sub-samples. The third column reports the Diebold-Mariano test statistic for the null hypothesis that the gap was unchanged across the sample break. Table 4 presents the results for the Fed versus the SPF. For the most part, the gap between the SPF's errors and the Fed's errors dropped after each sample break suggesting an erosion of the Fed's advantage relative to the SPF. The break at 1994 yields the most consistently significant drop in the gap although the difference in pre- and post-1994 gaps is only marginally significant at the 0, 2 and 3 quarter horizons. The comparison between the pre-Great Moderation and the 1984-1993 periods shows the smallest decline (in fact at the 0 horizon the gap increased). This result suggests that the erosion of the Fed's forecasting advantage for inflation did not happen immediately after the onset of the Great Moderation.

Table 5 presents the results for the Fed versus the BC. As described above in section 4, the BC had smaller forecast errors than the Fed at the zero horizon prior to 1984 and so it is not surprising that all of the comparisons with the pre-Great Moderation period show an increase in the gap at the zero horizon. But other than the zero horizon results, the gap dropped in the post-1984 and post-1994 periods. One difference between the BC results and the SPF results is that the decline in the gap appears to have taken place earlier than the mid-1990s. The gap dropped significantly between the pre-1984 period and the period which spans 1984 through 1993 (between the onset of the Great Moderation and the start of the Fed's announcement period). Furthermore, the drop in the gap was larger after the 1984 split compared to the post 1994.

Table 6 presents the results for the Fed versus the naïve forecast. The gap between the naïve forecast errors and the Fed's forecast errors dropped after 1994. The decline was significant at the zero horizon where the gap fell from .44 before 1994 to .13 after 1994. The decline in the gap was marginally significant at horizons 1 and 4 as well. Overall, the results in Table 6 suggest that the Fed's forecasting advantage with respect to the naïve forecast eroded after the mid-1990s.

6. Do Fed Inflation Forecasts Contain Additional Information?

The above comparisons of RMSEs and absolute forecast errors can be thought of as unconditional forecast comparisons. In this section we follow the empirical methodology used by Fair and Shiller (1989) as well as Romer and Romer (2000) to measure the marginal contribution of Fed, private sector and naïve forecasts. This method involves regressing actual observations (x_t) on two (or more) forecasts (x_{ht}^{f1} and x_{ht}^{f2}):

$$x_{ht} = \delta + \gamma_1 x_{ht}^{f1} + \gamma_2 \pi_{ht}^{f2} + \nu_{ht} \qquad (2)$$

where subscript h is the forecast horizon. If $\gamma_1 = 0$ then forecast 1 has no additional information that is not contained in forecast 2 and if $\gamma_2 = 0$ then forecast 2 has no additional information that is not contained in forecast 1.

In tables 7 through 9 we present the results of our estimations of this equation over various sub-samples. The results for the SPF (table 7) suggest an erosion of the Fed's forecasting advantage with respect to inflation. As was the case in our earlier tests, the erosion appears to have taken place well after the onset of the Great Moderation.

The estimates reported in table 7 show that the Fed's forecasts did not provide additional information given the SPF's forecasts of inflation after 1994.

The results reported in table 8 for the Blue Chip are less consistent across horizons. The Fed apparently has lost an edge at horizons 3 and 4 and overall (horizons 0-4 combined) but still retains an informational advantage at the short horizons (0-2). Table 9 shows the information content of the Fed's forecasts relative to the naïve forecasts. The Fed's forecasts contain information in all samples at all horizons except for the post-1994 sample, horizons 3 and 4.

The overall fit (R^2) of these regressions declined after 1994, particularly at horizons 3 and 4. This is consistent with Stock and Watson (2007) who found that the variation in the predictable component of inflation declined after the Great Moderation.

7. Endogenous Break Point Results

For our tests presented above we exogenously imposed sample breaks at 1984 and 1994. In this section we present results from the Quandt-Andrews endogenous breakpoint test applied to gap_t. [12] Table 10 shows the dates and Likelihood ratio (LR) test statistics. Significance levels are based on Hansen's (1997) approximate asymptotic p-values. For cases where we found significant breakpoints we re-applied the Quandt-Andrews test on the post-break sample. We report any additional significant break points in columns 4 and 6.

For the Fed and the SPF there appears to be a significant break in the gap in the mid-1970s for the zero and 1 quarter horizons. The end of the recession in March 1975 brought about a large reversal in inflation that the median SPF forecaster missed by a

[12] See Quandt (1960), Andrews (1993) and Andrews and Ploberger (1994).

considerable margin[13]. The remaining break dates appear to be clustered around the mid-1980s to the mid-1990s. The break dates for the BC are also clustered around the mid-1980s to mid-1990s.[14]

Tables 11 and 12 report the RMSEs and $gap_t s$ for the various sample splits identified by the endogenous breakpoint tests. Table 11 compares the Fed and the SPF. Table 12 compares the Fed and BC. Only horizons for which the LR statistics were significant are reported in these tables.

As noted above, the split in the mid-1970s was likely due to the extreme outliers associated with the 1973-75 recession. Nonetheless, there is evidence that the Fed's forecasting advantage with respect to inflation in the current quarter disappeared after the mid-1970s. At the 4 quarter ahead horizon as well as for the average across all horizons, the Fed's forecasting advantage disappeared after the mid-1990s. The results for the 4 quarter ahead and for the average across all horizons are similar to the results reported in Table 1 where we imposed the break date at 1994.1. The final column in Table 11 shows that the gap between the absolute value of the Fed's forecast errors and the SPF's forecast errors declined significantly across the sample breaks identified by the endogenous break point tests.

Table 12 shows the comparisons of RMSEs between the Fed and the BC. The endogenous break point tests identified breaks at all horizons. The breaks appear in the mid-to-late-1980s, the mid-1990s or both. The gap between the absolute value of the

[13]Inflation dropped from 14.18% in the fourth quarter of 1974 to 8.3% in the first quarter of 1975, the largest quarter-to quarter reversal for inflation in our sample. Inflation dropped further to 5.2% in the second quarter of 1975. It is not surprising that these large swings generated large forecast errors. The SPF forecast errors for inflation in the first and second quarters of 1975 were among the largest of the entire sample.

[14] Recall that the BC sample starts in 1980. Thus, the outliers associated with the end of the recession in 1975 are not part of the BC sample.

Fed's forecast errors and the absolute value of the BC's forecast errors dropped in each of the "post" samples except for the zero horizon post-1983.04 sample period. As pointed out above, the Fed had a larger RMSE than the BC in the 1980-1983 sample period. With the exception of this result, however, there is consistent evidence that the Fed's forecasting advantage dropped after the mid-1980s and again after the mid-1990s.

8. Conclusion

Romer and Romer (2000) and Sims (2002) find that the Fed was better than the private sector at forecasting inflation. Romer and Romer used data through 1992 and Sims used data through 1996. Neither study considered *changes* in the Fed's relative forecasting advantage.

We examine whether the Fed has maintained its forecasting advantage since the onset of the Great Moderation. Atkeson and Ohanian (2001), and Stock and Watson (2007) found that the volatility of the predictable components of inflation has declined after the Great Moderation. It therefore should follow that the Fed's forecasting advantage has declined as well. We find that the Fed's advantage in forecasting inflation has declined. Across all forecast horizons (0-4 quarters ahead) the gap between Fed inflation forecast errors and private sector inflation forecasting errors (all forecast horizons combined) dropped by roughly half after 1994. In comparison with the naïve forecast, the gap (all horizons combined) dropped by nearly 90%.

Romer and Romer suggest that the Fed's forecasting advantage arose from the large amount of resources they devote to forecasting. Our results suggest the Fed is getting a smaller bang for its buck. It may also be the case that the erosion of the Fed's forecasting advantage has contributed to the recent puzzling response of the yield curve

to changes in monetary policy. Romer and Romer's results suggested that long-term interest rates increased in response to a Fed tightening because the Fed revealed information about its (then) superior forecasts of the economy whenever it changed the federal funds interest rate target. During the most recent Fed tightening episode however, long-term interest rates did not rise (Alan Greenspan described this as the yield curve conundrum) which is consistent with an erosion of the Fed's forecasting advantage.

Finally, with respect to the Fed's movement toward greater transparency, our findings suggest that the potential destabilizing effects of Fed inflation forecasts has declined, if not disappeared, with the erosion of the Fed's forecast advantage.

Figure 1: Fed vs SPF
Inflation Forecast Errors

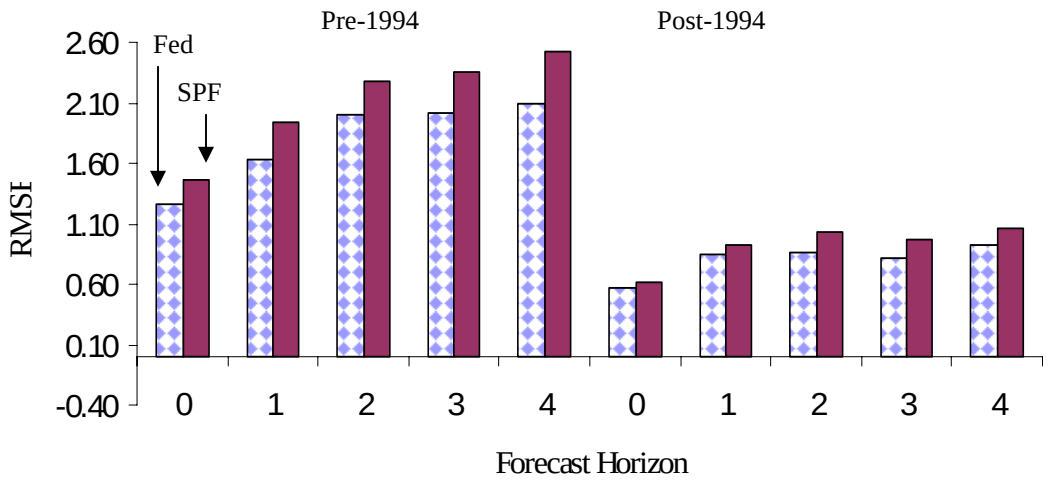

Figure 2: Fed vs BC
Inflation Forecast Errors

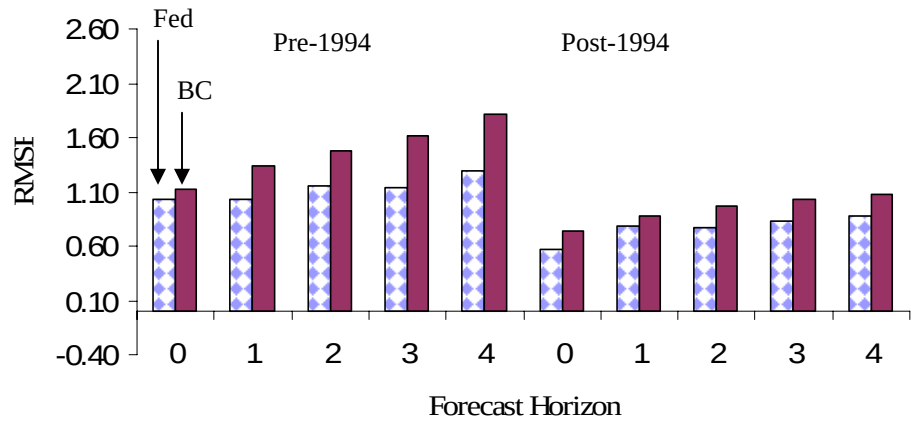

Table 1
Inflation Forecast RMSE Comparison
Fed vs SPF

	horizon	RMSE Fed	RMSE SPF	Ratio $\mathbf{RMSE_{SPF}/RMSE_{Fed}}$	Modified DM	N
Full sample	0	1.14	1.33	1.16	2.59*	108
1968-2001	1	1.50	1.77	1.18	5.25**	108
	2	1.81	2.07	1.15	4.15**	107
	3	1.82	2.12	1.17	4.47**	102
	4	1.87	2.25	1.20	6.00**	93
	0-4	1.13	1.38	1.23	6.24**	93
Pre-GM	0	1.43	1.64	1.15	1.61	56
1968-1983	1	1.89	2.24	1.18	5.27**	56
	2	2.34	2.66	1.14	3.48**	55
	3	2.42	2.79	1.15	3.40**	50
	4	2.58	3.08	1.19	4.47**	41
	0-4	1.57	1.89	1.20	4.46**	41
Post-GM	0	0.73	0.88	1.21	2.53**	52
1984-2001	1	0.90	1.06	1.19	2.12*	52
	2	0.97	1.16	1.20	2.31*	52
	3	0.90	1.17	1.29	3.08**	52
	4	1.00	1.27	1.27	4.49**	52
	0-4	0.56	0.77	1.37	4.42**	52
Pre-Announce	0	1.26	1.46	1.17	2.75**	85
1968-1993	1	1.63	1.94	1.19	5.62**	85
	2	1.99	2.28	1.14	3.95**	84
	3	2.02	2.36	1.17	4.32**	79
	4	2.09	2.53	1.21	5.87**	70
	0-4	1.25	1.53	1.22	6.08**	70
Post-Announce	0	0.56	0.62	1.10	0.16	23
1994-2001	1	0.85	0.93	1.09	0.51	23
	2	0.86	1.03	1.20	1.48	23
	3	0.82	0.96	1.18	1.77†	23
	4	0.92	1.06	1.16	1.84†	23
	0-4	0.63	0.78	1.25	2.08*	23
Post-GM & Pre-Announce	0	0.84	1.04	1.24	3.21**	29
1984-1993	1	0.93	1.16	1.25	2.19*	29
	2	1.04	1.25	1.20	1.77†	29
	3	0.97	1.31	1.35	2.56*	29
	4	1.06	1.42	1.33	4.71**	29
	0-4	0.50	0.76	1.52	4.36**	29

Note: ** denotes significance at 1%, * denotes significance at 5%, † denotes significance at 10%

Table 2
Inflation Forecast RMSE Comparison
Fed vs Blue Chip (BC)

	horizon	RMSE Fed	RMSE BC	Ratio $\mathbf{RMSE_{BC}/RMSE_{Fed}}$	Modified DM	N
Full sample	0	0.89	1.01	1.13	2.70**	176
1980-2001	1	0.95	1.19	1.25	4.94**	176
	2	1.03	1.33	1.28	4.61**	176
	3	1.04	1.44	1.38	5.35**	176
	4	1.16	1.58	1.37	6.29**	172
	0-4	0.63	0.96	1.53	6.70**	172
Pre-GM	0	1.40	1.24	0.89	-0.98	34
1980-1983	1	1.21	1.62	1.33	4.58**	34
	2	1.44	1.99	1.38	3.91**	34
	3	1.37	2.10	1.53	3.91**	34
	4	1.68	2.48	1.48	4.54**	30
	0-4	0.91	1.48	1.62	3.81**	30
Post-GM	0	0.72	0.94	1.31	4.64**	142
1984-2001	1	0.88	1.07	1.21	3.52**	142
	2	0.91	1.11	1.22	3.41**	142
	3	0.95	1.23	1.30	4.26**	142
	4	1.01	1.32	1.30	5.42**	142
	0-4	0.55	0.81	1.47	6.10**	142
Pre-Announce	0	1.03	1.13	1.10	1.90†	114
1980-1993	1	1.03	1.33	1.29	5.60**	114
	2	1.15	1.48	1.29	3.90**	114
	3	1.14	1.62	1.42	4.56**	114
	4	1.29	1.81	1.40	5.63**	110
	0-4	0.66	1.05	1.60	5.81**	110
Post-Announce	0	0.56	0.74	1.31	2.24*	62
1994-2001	1	0.79	0.88	1.12	0.96	62
	2	0.77	0.97	1.27	2.79**	62
	3	0.82	1.03	1.25	3.33**	62
	4	0.88	1.07	1.22	3.51**	62
	0-4	0.58	0.78	1.34	3.96**	62
Post-GM & Pre-Announce	0	0.82	1.08	1.31	3.98**	80
1984-1993	1	0.95	1.19	1.26	3.82**	80
	2	1.00	1.21	1.20	2.38**	80
	3	1.04	1.37	1.32	3.21**	80
	4	1.11	1.48	1.34	4.51**	80
	0-4	0.53	0.83	1.57	5.27**	80

Note: ** denotes significance at 1%, * denotes significance at 5%, † denotes significance at 10%

Table 3
Inflation Forecast RMSE Comparison
Fed vs Naïve Model

	horizon	RMSE Fed	RMSE Naïve	Ratio $\mathbf{RMSE_{Naive}/RMSE_{Fed}}$	Modified DM	N
Full sample	0	1.15	1.70	1.49	3.93**	316
1968-2001	1	1.56	2.02	1.30	2.44**	311
	2	1.81	2.17	1.20	1.74†	302
	3	1.88	2.29	1.22	2.23*	285
	4	1.93	2.59	1.34	3.05**	256
	0-4	1.17	1.95	1.67	4.04**	256
Pre-GM	0	1.40	2.02	1.44	2.68**	174
1968-1983	1	1.95	2.47	1.26	1.53	169
	2	2.34	2.71	1.16	0.99	160
	3	2.48	3.01	1.22	1.79†	143
	4	2.67	3.63	1.36	2.38**	114
	0-4	1.65	2.81	1.71	4.11**	114
Post-GM	0	0.72	1.22	1.69	3.87**	142
1984-2001	1	0.88	1.30	1.47	3.36**	142
	2	0.91	1.33	1.47	3.10**	142
	3	0.95	1.19	1.25	2.30*	142
	4	1.01	1.26	1.24	2.72**	142
	0-4	0.55	0.75	1.36	1.88†	142
Pre-Announce	0	1.25	1.86	1.49	3.81**	254
1968-1993	1	1.70	2.21	1.30	2.51**	249
	2	2.00	2.38	1.19	1.65†	240
	3	2.08	2.54	1.22	2.26*	223
	4	2.16	2.92	1.35	2.85**	194
	0-4	1.31	2.21	1.69	4.09**	194
Post-Announce	0	0.56	0.82	1.46	1.44	62
1994-2001	1	0.79	0.94	1.20	0.49	62
	2	0.77	1.01	1.32	1.26	62
	3	0.82	0.96	1.16	0.88	62
	4	0.88	1.06	1.21	1.88†	62
	0-4	0.58	0.73	1.26	0.88	62
Post-GM & Pre-Announce	0	0.82	1.45	1.76	3.69**	80
1984-1993	1	0.95	1.52	1.60	4.12**	80
	2	1.00	1.53	1.53	2.92**	80
	3	1.04	1.34	1.30	2.25*	80
	4	1.11	1.39	1.26	2.19*	80
	0-4	0.53	0.76	1.44	1.90†	80

Note: ** denotes significance at 1%, * denotes significance at 5%, † denotes significance at 10%

Table 4
Difference between the Absolute Forecast Errors (**SPF** minus Fed)

Horizon	Pre-GM 1968-1983	Post-GM 1984-2001	Modified Diebold-Mariano t-stat
0	0.17	0.15	0.11
1	0.40	0.15	2.50*
2	0.35	0.15	1.66†
3	0.38	0.22	1.16
4	0.62	0.28	2.26*
0-4	0.35	0.21	1.58

	Pre-Announce 1968-1993	Post-Announce 1994-2001	Modified Diebold-Mariano t-stat
0	0.20	0.01	1.74†
1	0.34	0.04	3.15**
2	0.29	0.11	1.80†
3	0.34	0.15	1.75†
4	0.52	0.19	2.52*
0-4	0.31	0.15	1.91†

	Pre-GM 1968-1983	Post-GM & Pre-Announce 1984-1993	Modified Diebold-Mariano t-stat
0	0.17	0.27	-0.75
1	0.40	0.23	1.33
2	0.35	0.19	1.13
3	0.38	0.29	0.59
4	0.62	0.36	1.68†
0-4	0.35	0.26	0.99

	Post-GM & Pre-Announce 1984-1993	Post-Announce 1994-2001	Modified Diebold-Mariano t-stat
0	0.27	0.01	2.21*
1	0.23	0.04	1.50
2	0.19	0.11	0.62
3	0.29	0.15	1.02
4	0.36	0.19	1.42
0-4	0.26	0.15	1.19

Note: ** denotes significance at 1%, * denotes significance at 5%, † denotes significance at 10%

Table 5

Difference between the Absolute Forecast Errors (**Blue Chip** minus Fed)

Horizon	Pre-GM 1980-1983	Post-GM 1984-2001	Modified Diebold-Mariano t-stat
0	-0.16	0.22	-2.33*
1	0.43	0.17	2.56*
2	0.60	0.17	2.77**
3	0.70	0.24	2.53*
4	0.94	0.31	3.02**
0-4	0.58	0.24	2.25*

	Pre-Announce 1980-1993	Post-Announce 1994-2001	Modified Diebold-Mariano t-stat
0	0.14	0.15	-0.02
1	0.31	0.06	3.09**
2	0.30	0.16	1.50
3	0.40	0.21	1.71†
4	0.52	0.25	2.36*
0-4	0.36	0.19	2.06*

	Pre-GM 1980-1983	Post-GM & Pre-Announce 1984-1993	Modified Diebold-Mariano t-stat
0	-0.16	0.27	-2.55*
1	0.43	0.26	1.57
2	0.60	0.17	2.57*
3	0.70	0.26	2.28*
4	0.94	0.36	2.67**
0-4	0.58	0.27	1.96*

	Post-GM & Pre-Announce 1984-1993	Post-Announce 1994-2001	Modified Diebold-Mariano t-stat
0	0.27	0.15	1.34
1	0.26	0.06	2.21*
2	0.17	0.16	0.17
3	0.26	0.21	0.50
4	0.36	0.25	1.09
0-4	0.27	0.19	1.10

Note: ** denotes significance at 1%, * denotes significance at 5%, † denotes significance at 10%

Table 6

Difference between the Absolute Forecast Errors (**Naïve** minus Fed)

Horizon	Pre-GM 1968-1983	Post-GM 1984-2001	Modified Diebold-Mariano t-stat
0	0.43	0.32	0.59
1	0.35	0.31	0.17
2	0.26	0.26	-0.02
3	0.50	0.18	1.08
4	0.88	0.26	1.64
0-4	1.06	0.13	3.52**

	Pre-Announce 1968-1993	Post-Announce 1994-2001	Modified Diebold-Mariano t-stat
0	0.44	0.13	2.13*
1	0.41	0.05	1.81†
2	0.29	0.12	0.86
3	0.41	0.08	1.62
4	0.65	0.19	1.87†
0-4	0.69	0.08	3.23**

	Pre-GM 1968-1983	Post-GM & Pre-Announce 1984-1993	Modified Diebold-Mariano t-stat
0	0.43	0.47	-0.21
1	0.35	0.51	-0.61
2	0.26	0.37	-0.39
3	0.50	0.26	0.77
4	0.88	0.32	1.43
0-4	1.06	0.17	3.30**

	Post-GM & Pre-Announce 1984-1993	Post-Announce 1994-2001	Modified Diebold-Mariano t-stat
0	0.47	0.13	2.20*
1	0.51	0.05	2.78**
2	0.37	0.12	1.57
3	0.26	0.08	1.22
4	0.32	0.19	0.76
0-4	0.17	0.08	0.72

Table 7
Tests for Additional Information: Fed vs SPF

Sample	Horizon	Fed	SPF	R^2	N
Full	0	.87** (.17)	.19 (.17)	.84	108
1968-2001	1	1.46** (.21)	-.39* (.19)	.75	108
	2	1.57** (.39)	-.59 (.42)	.63	107
	3	1.67** (.28)	-.66* (.27)	.61	102
	4	1.88** (.28)	-.81** (.29)	.65	93
	0-4	1.79** (.33)	-.81* (.34)	.83	93
Pre-GM	0	.82** (.20)	.21 (.21)	.73	56
1968-1983	1	1.48** (.26)	-.61* (.24)	.57	56
	2	1.52** (.46)	-.89† (.50)	.40	55
	3	1.56** (.30)	-.86* (.36)	.39	50
	4	1.86** (.29)	-1.30** (.40)	.45	41
	0-4	2.01** (.31)	-1.42** (.37)	.66	41
Post-GM	0	.84** (.24)	.13 (.21)	.62	52
1984-2001	1	1.00** (.23)	.03 (.20)	.56	52
	2	.85** (.25)	.15 (.25)	.50	52
	3	1.12** (.25)	-.20 (.29)	.55	52
	4	1.13** (.25)	-.34 (.32)	.50	52
	0-4	.98** (.27)	-.04 (.27)	.76	52
Pre-Announce	0	.89** (.18)	.14 (.19)	.79	85
1968-1993	1	1.49** (.21)	-.48* (.20)	.68	85
	2	1.59** (.39)	-.75 (.44)	.53	84
	3	1.68** (.28)	-.79** (.29)	.52	79
	4	1.96** (.28)	-.97** (.31)	.56	70
	0-4	1.97** (.34)	-1.09** (.36)	.78	70
Post-Announce	0	.31 (.21)	.42 (.28)	.38	23
1994-2001	1	.71† (.38)	-.26 (.41)	.17	23
	2	.94 (.64)	-.65 (.74)	.15	23
	3	.18 (.40)	.003 (.46)	.01	23
	4	-.43 (.27)	.51 (.38)	.08	23
	0-4	.25 (.24)	.06 (.26)	.07	23
Post-GM & Pre-	0	1.14** (.31)	-.31 (.32)	.45	29
Announce	1	1.13** (.27)	-.03 (.23)	.45	29
1984-1993	2	.84** (.27)	.11 (.34)	.33	29
	3	1.32** (.32)	-.51 (.39)	.43	29
	4	1.61** (.22)	-.98* (.31)	.50	29
	0-4	1.42** (.29)	-.62* (.29)	.72	29

Note: Newey-West standard errors are in parentheses next to the coefficients, ** denotes significance at 1%, * denotes significance at 5%, † denotes significance at 10%

Table 8
Tests for Additional Information: Fed vs BC

Sample	Horizon	Fed	BC	R^2	N
Full	0	.64** (.12)	.38** (.15)	.89	176
1980-2001	1	1.01** (.13)	-.04 (.16)	.86	176
	2	1.11** (.18)	-.20 (.20)	.80	176
	3	1.17** (.19)	-.25 (.21)	.79	176
	4	1.04** (.25)	-.17 (.21)	.66	172
	0-4	1.02** (.17)	-.11 (.17)	.92	172
Pre-GM	0	.21 (.20)	1.00** (.26)	.85	34
1980-1983	1	1.19** (.28)	-.29 (.41)	.85	34
	2	1.27** (.37)	-.43 (.57)	.79	34
	3	1.55** (.37)	-.90 (.61)	.80	34
	4	1.29† (.72)	-.54 (.93)	.59	30
	0-4	1.11** (.27)	-.25 (.31)	.91	30
Post-GM	0	.88** (.10)	.11 (.12)	.70	142
1984-2001	1	.92** (.16)	.09 (.16)	.56	142
	2	1.03** (.24)	-.04 (.23)	.55	142
	3	1.13** (.23)	-.25 (.24)	.52	142
	4	1.04** (.27)	-.20 (.29)	.48	142
	0-4	1.00** (.25)	-.07 (.25)	.77	142
Pre-Announce	0	.61** (.16)	.41* (.20)	.86	114
1968-1993	1	1.14** (.16)	-.22 (.22)	.84	114
	2	1.16** (.20)	-.29 (.25)	.76	114
	3	1.23** (.21)	-.35 (.25)	.76	114
	4	1.17** (.27)	-.33 (.26)	.60	110
	0-4	1.08** (.18)	-.22 (.18)	.92	110
Post-Announce	0	.76** (.13)	.22 (.26)	.58	62
1994-2001	1	.71** (.24)	-.22 (.32)	.23	62
	2	1.10** (.37)	-.63 (.39)	.22	62
	3	.62 (.39)	-.19 (.41)	.07	62
	4	.06 (.33)	.08 (.37)	.01	62
	0-4	.87 (.34)	-.38 (.31)	.20	62
Post-GM & Pre-	0	.98** (.13)	-.12 (.21)	.56	80
Announce	1	1.10** (.20)	-.11 (.23)	.44	80
1984-1993	2	.96** (.28)	-.02 (.31)	.36	80
	3	1.24** (.26)	-.52 (.31)	.38	80
	4	1.40** (.32)	-.77† (.41)	.39	80
	0-4	1.05** (.26)	-.26 (.27)	.66	80

Note: Newey-West standard errors are in parentheses next to the coefficients, ** denotes significance at 1%, * denotes significance at 5%, † denotes significance at 10%

Table 9
Tests for Additional Information: Fed vs Naive

Sample	Horizon	Fed	Naive	R^2	N
Full	0	.90** (.08)	.16* (.07)	.85	316
1968-2001	1	.93** (.12)	.14** (.09)	.72	311
	2	.88** (.19)	.17 (.20)	.63	302
	3	.96** (.15)	.13 (.16)	.61	285
	4	1.12** (.15)	.01 (.13)	.59	256
	0-4	.96** (.12)	.10 (.11)	.82	256
Pre-GM	0	.87** (.12)	.16† (.08)	.76	174
1968-1983	1	.81** (.14)	.11 (.16)	.53	169
	2	.68** (.22)	.14 (.23)	.36	160
	3	.81** (.18)	.04 (.16)	.32	143
	4	.90** (.23)	-.15 (.13)	.22	114
	0-4	.74** (.17)	.08 (.14)	.49	114
Post-GM	0	.91** (.08)	.09 (.08)	.70	142
1984-2001	1	.97** (.12)	.03 (.08)	.56	142
	2	1.12** (.15)	-.15 (.10)	.56	142
	3	.87** (.16)	.04 (.10)	.51	142
	4	.80** (.18)	.08 (.12)	.48	142
	0-4	.89** (.11)	.03 (.06)	.77	142
Pre-Announce	0	.90** (.09)	.15* (.07)	.80	254
1968-1993	1	.91** (.12)	.12 (.14)	.64	249
	2	.80** (.19)	.17 (.20)	.51	240
	3	.91** (.15)	.13 (.15)	.50	223
	4	1.09** (.17)	.005 (.13)	.46	194
	0-4	.92** (.13)	.10 (.12)	.74	194
Post-Announce	0	.78** (.11)	.18 (.12)	.60	62
1994-2001	1	.60** (.17)	.05 (.16)	.23	62
	2	.70** (.25)	-.15 (.22)	.18	62
	3	.44 (.30)	.01 (.23)	.06	62
	4	.18 (.23)	-.16 (.17)	.03	62
	0-4	.51**(.19)	-.0002 (.13)	.17	62
Post-GM & Pre-	0	.90** (.10)	.02 (.12)	.56	80
Announce	1	1.05** (.15)	-.04 (.09)	.44	80
1984-1993	2	1.09** (.19)	-.20† (.12)	.38	80
	3	.85** (.18)	.03 (.11)	.35	80
	4	.78** (.22)	.11 (.15)	.35	80
	0-4	.81** (.13)	.02 (.07)	.65	80

Note: Newey-West standard errors are in parentheses next to the coefficients, ** denotes significance at 1%, * denotes significance at 5%, † denotes significance at 10%

Table 10: Endogenous Break Dates for gap_t

SPF vs Fed	Break	LR stat	Break	LR stat	Break	LR stat
Horizon	Date		Date		Date	
0	1975.02	16.86**	1985.20	7.15†	1995.08	7.13†
1	1975.05	12.36**				
2	1990.05	4.63				
3	1987.08	6.39				
4	1996.05	9.70*				
0-4	1995.11	8.20†				
BC vs Fed						
Horizon						
0	1983.05	18.74**				
1	1985.08	18.55**				
2	1985.10	31.70**	1988.06	9.24*	1995.09	8.57*
3	1986.05	46.64**	1988.10	9.43*	1996.05	11.35**
4	1985.09	48.54**	1996.05	10.99*		
0-4	1985.10	51.46**	1991.05	13.28**	1995.12	69.57**

Note: ** denotes significance at 1%, * denotes significance at 5%, † denotes significance at 10%

Table 11: RMSE and Gap comparisons Across Endogenously Determined Sample Splits
Fed vs SPF, Inflation

		Dates of Endog				Modified DM			Modified DM
	horizon	**Sample Split**	**$RMSE_{FED}$**	**$RMSE_{SPF}$**	**Ratio**	**$RMSE_{FED}$=$RMSE_{SPF}$**	**N**	**gap**	**$gap_{sample1}$=$gap_{sample2}$**
sample 1	0	1968.11-1975.01	1.52	2.06	1.36	3.87**	24	0.56	3.44**
sample 2		1975.02-2001.12	1.01	1.03	1.02	0.80	84	0.05	
sample 1	1	1968.11-1975.04	2.42	2.88	1.19	5.19**	25	0.59	3.33**
sample 2		1975.05-2001.12	1.07	1.26	1.17	3.28**	83	0.18	
sample 1	4	1968.11-1996.04	2.01	2.44	1.21	6.49**	76	0.53	4.09**
sample 2		1996.05-2001.12	1.05	1.09	1.03	0.16	17	0.02	
sample 1	0-4	1968.11-1995.10	1.21	1.49	1.24	6.68**	75	0.33	3.59**
sample 2		1995.11-2001.12	0.67	0.73	1.08	0.66	18	0.04	

Note: ** denotes significance at 1%, * denotes significance at 5%, † denotes significance at 10%

Table 12: RMSE and Gap comparisons Across Endogenously Determined Sample Splits
Fed vs BC, Inflation

	horizon	Dates of Endog Sample Split	$RMSE_{FED}$	$RMSE_{BC}$	ratio	Modified DM $RMSE_{FED}$ =$RMSE_{BC}$	N	gap	Modified DM gapsample1 =gapsample2	Modified DM gapsample2 =gapsample3	Modified DM gapsample3 =gapsample4
sample 1	0	1980.01-1983.04	1.52	1.30	0.85	-1.68†	28	-0.27	-3.07**		
sample 2		1983.05-2001.12	0.71	0.94	1.32	4.82**	148	0.22			
sample 1	1	1980.01-1985.07	1.16	1.60	1.37	6.23**	46	0.47	3.84**		
sample 2		1985.08-2001.12	0.87	1.02	1.17	2.74**	130	0.13			
sample 1	2	1980.01-1985.09	1.32	1.87	1.42	4.69**	48	0.58	3.48**		
sample 2		1985.10-1988.05	1.37	1.34	0.98	-0.55	21	-0.09		-2.14*	
sample 3		1988.06-1995.08	0.77	1.03	1.34	4.31**	58	0.25			2.32**
sample 4		1995.09-2001.12	0.79	0.94	1.18	1.32	49	0.07			
sample 1	3	1980.01-1986.04	1.41	2.13	1.51	5.78**	52	0.72	4.40**		
sample 2		1986.05-1988.09	0.96	0.90	0.93	-0.62	20	-0.09		-2.70**	
sample 3		1988.10-1996.04	0.73	1.06	1.45	4.40**	58	0.33			2.67**
sample 4		1996.05-2001.12	0.92	1.03	1.12	1.47	46	0.08			
sample 1	4	1980.01-1985.08	1.63	2.41	1.48	5.92**	43	0.87	3.17**		
sample 2		1985.09-1996.04	0.92	1.23	1.34	4.98**	83	0.36		2.68**	
sample 3		1996.05-2001.12	0.99	1.10	1.11	1.71†	46	0.11			
sample 1	0-4	1980.01-1985.09	0.87	1.45	1.66	5.78**	44	0.59	4.49**		
sample 2		1985.10-1991.04	0.48	0.57	1.20	1.73†	44	0.09		-6.10**	
sample 3		1991.05-1995.11	0.42	0.85	2.03	14.44**	37	0.44			6.48**
sample 4		1995.12-2001.12	0.62	0.73	1.18	2.34**	47	0.10			

Note: ** denotes significance at 1%, * denotes significance at 5%, † denotes significance at 10%

References

Andrews, D. W. K., Tests for Parameter Instability and Structural Change With Unknown Change Point," Econometrica, vol. 61, no. 4, pp. 821-56, 1993.

_____ and Ploberger, "Optimal Tests When a Nuisance Parameter is Present Only Under the Alternative," Econometrica, vol. 62, no. 6, 1383-1414, 1994.

Atkeson, A. and L. E. Ohanian, "Are Phillips Curves Useful for Forecasting Inflation?" Federal Reserve Bank of Minneapolis Quarterly Review, 25(1), 2001, pp. 2-11.

Bernanke, Ben S., "The Great Moderation," Speech to the Eastern Economic Association, Washington, DC, http://www.federalreserve.gov/boarddocs/speeches/2004/20040220/default.htm, February 20, 2004.

Blanchard, O. and J. Simon, "The Long and Large Decline in U.S. Output Volatility," Brookings Papers on Economic Activity, no. 1, 2001, pp. 135-64.

Cukierman, A. "Accountability, Credibility, Transparency and Stabilization Policy in the Eurosystem ", in C. Wyplosz (ed.), The Impact of EMU on Europe and the Developing Countries, Oxford University Press, 2001, pp. 40-75.

_____. "The Limits of Transparency", Forthcoming in Siklos P. et.al. (eds.), Frontiers in Central Banking, Elsevier, 2007.

Fair, R. C., and R. Shiller, "The Informational Content of Ex Ante Forecasts," The Review of Economics and Statistics, vol. 71, no. 2, May 1989, pp. 325-31.

Ferguson, R. "Why Central Banks Should Talk" Speech Delivered At the Graduate Institute of International Studies, Geneva, Switzerland January 8, 2002 http://www.federalreserve.gov/boarddocs/speeches/2002/20020108/default.htm

Gavin, W. and R. Mandal, "Forecasting Inflation and Growth: Do Private Forecasts Match Those of Policymakers?" Review, Federal Reserve Bank of St. Louis, May/June 2001, pp. 11-19.

Geraats, P. M., "Why Adopt Transparency? The Publication of Central Bank Forecasts," European Central Bank Working Paper no. 41, January 2001.

Gersbach H. (2003), "On the Negative Social Value of Central Bank's Knowledge Transparency", Economics of Governance, 4(2), 91-102, August.

Hansen, B. E. "Approximate Asymptotic P Values for Structural-Change Tests," Journal of Business and Economic Statistics, vol. 15, no. 1, 1997, pp. 60-7.

Harvey, David, Stephen Leybourne and Paul Newbold (1997). "Testing the equality of prediction mean squared errors." International Journal of Forecasting 13, 281-291.

Kahn, J., M. Mconnell and G. Perez- Quiros, "On the Causes of Increased Stability of the U.S. Economy," Economic Policy Review, Federal Reserve Bank of New York, May 2002, pp. 183-202.

Kim, Chang-Jin, C. Nelson and J. Piger, "The Less Volatile U.S. Economy: A Bayesian Investigation of Timing, Breadth, and Potential Explanations," Journal of Business and Economic Statistics, 22 (1), Jan. 2004, 80-93.

Makridakis, S. and Hibon, M. "The M3-Competition: Results, Conclusions and Implications," International Journal of Forecasting, vol. 16, 2000, 451-476.

McConnell, M. and G. Perez-Quiros, " Output Fluctuations in the United States: What Has Changed since the Early 1980s?" American Economic Review, vol. 90, no. 5, pp. 1464-76, 2000.

Quandt, Richard E., 1960, "Tests of the Hypothesis that a Linear Regression System Obeys Two Separate Regimes." Journal of the American Statistical Association 55: 324-330.

Romer, C. and D. Romer, "Federal Reserve Information and the Behavior of Interest Rates," American Economic Review, vol. 90, no. 3, June 2000, pp. 429-57.

Schuh, S. "An Evaluation of Recent Macroeconomic Forecasting Errors," New England Economic Review, January/February 2001, pp. 35-56.

Sims, C. "The Role of Models and Probabilities in the Monetary Policy Process", Brookings Papers on Economic Activity, no. 2, 2002, p.1-62.

Sinclair, T., H. Stekler, and L Kitzinger, "Directional Forecasts of GDP and Inflation: A Joint Evaluation With an Application to Federal Reserve Predictions," George Washington University Research Program on Forecasting, working paper 2006-002, 2006.

Stock, J. and M. Watson, "Has the Business Cycle Changed? Evidence and Explanations," in Monetary Policy and Uncertainty: Adapting to a Changing Economy, Federal Reserve Bank of Kansas City symposium, Jackson Hole Wyoming, 2003.

_____, "Why Has U.S. Inflation Become Harder to Forecast?" Journal of Money, Credit and Banking, vol. 39, no. 1, February 2007