REVISITING THE GREENBOOK'S RELATIVE FORECASTING PERFORMANCE

Paul Hubert[1]
OFCE-Sciences Po

Since Romer and Romer (2000), a large literature has dealt with the relative forecasting performance of Greenbook macroeconomic forecasts of the Federal Reserve. This paper empirically reviews the existing results by comparing the different methods, data and samples used previously. The sample period is extended compared to previous studies and both real-time and final data are considered. We confirm that the Fed has a superior forecasting performance on inflation but not on output. In addition, we show that the longer the horizon, the more pronounced the advantage of Fed on inflation and that this superiority seems to decrease but remains prominent in the more recent period. The second objective of this paper is to underline the potential sources of this superiority. It appears that it may stem from better information rather than from a better model of the economy.

Keywords: Monetary Policy; Greenbook; Forecasts

Expectations are a crucial feature of most recent macroeconomic models as they determine both current and future outcomes. Moreover, managing private expectations has taken more and more weight in monetary policymaking all the more so with forward guidance policies and this reinforces the importance of central bank macroeconomic forecasts as a tool for central banking. Their evolution should be consistent with the commitment announced and the central bank targets (see Rosengren, 2014, and Walsh, 2013).

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Romer and Romer (2000) focused in their seminal paper on the relative forecast accuracy of Greenbook forecasts for inflation and output and showed that they were superior to private sector forecasts. This work has led many authors to assess the relative forecasting performance of the Federal Reserve and the US private sector among which Joutz and Stekler (2000), Atkeson and Ohanian (2001), Gavin and Mandal (2001), Sims (2002), Peek, Rosengren and Tootell (1998, 2003), Faust, Swanson and Wright (2004) and Amornthum (2006).

The first objective of this paper is to survey this abundant literature and to realize an empirical review by gathering the different methods, data and samples used in the literature. The main issues are whether Greenbook forecasts[2] are superior to private forecasts as measured by the Survey of Professional Forecasters (SPF), whether this advantage holds for inflation and GDP, and whether this advantage has reduced in the recent period with the Fed greater transparency or the drop in the predictable component of inflation evidenced by Atkeson and Ohanian (2001), D'Agostino, Giannone and Surico (2006), Campbell (2007) and Stock and Watson (2007).

This paper uses a range of methods previously applied in the literature: unconditional comparisons, conditional comparisons through regressions in the spirit of Fair and Shiller (1989, 1990) and Romer and Romer (2000), a pooling method of forecasts, and a factor analysis. The sample period is extended compared to previous studies and both real-time and final data are considered. An alternative measure of inflation is also tested. This work is different from the most recent papers on this topic (Reifschneider and Tulip 2007, D'Agostino and Whelan 2008, and Gamber and Smith 2009) in the extent that their focus is on the most recent period, while the contribution of this paper is to survey the relative forecasting performance of the Greenbook over the full sample.

The results are the following: first, the Greenbook has a superior forecasting performance on inflation. There is no evidence of any

2. It is worth noting that the Federal Reserve has greatly improved transparency about its decisions with the release of the statements, minutes and forecasts of Federal Open Market Committee (FOMC) meetings since 1994, but still publishes its staff forecasts (so-called Greenbook forecasts) only after a 5-year lag. Because FOMC forecasts appear to be policy oriented (Romer and Romer, 2008, and Ellison and Sargent, 2012) or to act as a focal point for private forecasts (Hubert, 2014a), we focus on Greenbook forecasts.

relative advantage for private forecasters or the Greenbook for real GNP/GDP. Second, it comes that the longer the horizon, the more pronounced the advantage of the Greenbook on inflation. This tends to confirm the advantage is sound and not due to access to information on the short run. This superiority is robust to timing disadvantage specification, introduction of lagged dependent variable, multicollinearity, real-time or final data, and to CPI measure of inflation. Third, one more recent debate hypothesizes that this advantage is disappearing when considering new extended samples during which the US monetary policy regime was stable and inflation expectations became fairly well-anchored. This outcome seems challenged by unconditional comparisons and estimates on the stable subsample which exhibits significantly better inflation forecasting performance. This paper confirms that the gap between the Greenbook and private sector has narrowed but the former preserves a better forecasting performance.

The second objective of this work is to underline some potential sources of the superior forecasting performance of the Greenbook. We use a factor model to disentangle the forecasting performance arising from the forecastable component of inflation (assumed to be based on a good model of the economy) and from the specific component (assumed to be based on better information about future shocks). Gamber and Smith (2009) attribute to the decline of the predictable component of inflation showed by Stock and Watson (2007) the narrowing of the Greenbook's superior forecasting performance. A better model is assumed to improve relatively more the common forecastable component, the technical element, while better private information is assumed to improve relatively more the specific component, the judgmental one. Estimates suggest that the better forecasting performance of the Greenbook stems from better information about future shocks. This is consistent with the argument that the decline in the predictable component of inflation affects all forecasters and not only the Greenbook. Second, the stabilization of the Fed's target and enhanced transparency may be much more responsible for the narrowing of the gap between the Fed and private agents. Third, this might be due to the amount of resources the Fed devotes to data collection.

The rest of the paper is organized as follows. Section 1 deals with the related literature. Section 2 describes the data. Section 3 presents the different estimation methods. Section 4 estimates the Greenbook's relative forecasting performance, while section 5 estimates the potential sources. Section 6 concludes.

1. Related Literature

Many authors have already assessed the relative forecasting[3] performance of the central bank and private agents and challenged the conclusions of Romer and Romer (2000). The following discussion is organized on three main issues.

1.1. Are Greenbook's forecasts superior to private forecasts?

On the one hand, Romer and Romer (2000) find evidence of a superior forecasting performance of the Federal Reserve, by comparing the Greenbook forecasts to private ones on the 1969-1991 sample. They show that the optimal linear combination of the private and Greenbook forecasts places a weight near to one on the Greenbook forecasts and essentially zero weight on private forecasts. Gavin and Mandal (2001) compare FOMC, Blue Chip and Greenbook forecasts. Based on the root mean squared errors, the Greenbook's forecasts of inflation are more accurate than any other forecasts on the 1983-1994 period, while the results are more contrasted for output. Sims (2002) analyzes the performance of all Federal Reserve forecasts and finds that on the 1979-1995 period, Greenbook ones are the most accurate inflation forecasts, but that

3. One question that arises from this literature is whether private forecasts do represent all private sector's information. Private forecasts are considered through surveys of many institutions, banks or firms from various horizons. They gather information from diverse places and are too a source of information for some others agents. This point of view seems to be supported by the fact that surveys are good predictors (Ang, Bekaert and Wei, 2007). It is possible that forecasts of one individual institution are occasionally more accurate than the mean of all forecasters, but first, they do not represent information of *all* private agents and second, a forecaster that would succeed to consistently provide the best forecasts on the market would become a known reference. Evidence does not support this view. In addition, it is possible that surveys gather model-driven forecasters and "noisy" forecasters; using Sims' (2002) procedure allows for dealing with this issue. Finally, it may be argued that these surveys tend to remove idiosyncratic differences. However, one might consider the opposite as these surveys are biased since respondents are generally the better informed agents through a selection bias. This reinforces the use of these surveys when assessing relative forecasting performance with the central bank.

the difference does not seem large with the MPS model of the Federal Reserve (the ancestor of the FRB/US model). Using a factor analysis, he also shows that the superiority of the Greenbook over private forecasters is strong for inflation, and statistically negligible for output. D'Agostino and Whelan (2008) show the Fed maintains its superior forecasting performance only on inflation and at short horizons for the period 1974-1991. Gamber and Smith (2009) focus on inflation and find Fed's forecast errors are significantly smaller than the private sector's for the period 1968-2001. Amornthum (2006) also claims that the Federal Reserve has a better forecast accuracy over the private sector by comparing inflation forecasts at the individual level in opposition to average consensus forecasts. Its results suggest that the Fed dominates SPF, but not all private forecasters and that this advantage decreases with longer horizon. Last, Peek, Rosengren and Tootell (1998, 2003) confirm this superiority in a different framework with specific data.[4]

On the other hand, Joutz and Stekler (2000) examine the characteristics of Fed's forecasts and compare them to ARIMA models and ASA/NBER surveys on the period 1965-1989. They focus on usual errors measures, tests for rationality and features of accuracy of these forecasts and find that the Fed predictions overall tended to yield the same type of errors that private forecasters have displayed. Atkeson and Ohanian (2001) compare inflation forecasts from the Greenbook with a naïve model of forecast and find that the RMSE for both "are basically the same" and argue then that Greenbook forecasts have on average been no better than the naive model. Their study covers the years 1984-1996: a period of very stable evolution of inflation. Faust, Swanson and Wright (2004) are concerned with the Federal Reserve policy surprises and whether they convey some private information. They conduct two tests of hypothesis and find that the Federal Reserve policy surprises could not systematically be used to improve forecasts of

4. They find that confidential supervisory information on bank ratings (CAMEL for "Capital, Assets, Management, Earnings and Liquidity". This composite rating evaluates the health of banks on these five categories and delivers a score between 1 (sound in every respect) and 5 (high probability of failure, severely deficient performance)) significantly improves private forecasts of inflation and unemployment rates, thus providing an informational advantage to the Federal Reserve. The contribution of this rating is independent too of publicly available leading indicators, adds significantly to private forecasts made even a full year after the information is gathered and released, and then provides a persistent informational advantage.

statistical releases and that forecasts are not systematically revised in response to policy surprises. They conclude that there is little evidence that Fed's surprises pass on superior information. Last, Baghestani (2008) finds unemployment forecasts are very similar between Fed and private forecasters for 1983-2000.

1.2. Does this advantage hold for both inflation and GDP?

Romer and Romer (2000) and Peek, Rosengren and Tootell (1998, 2003) find that the better forecasting performance holds for both inflation and GDP while Gavin and Mandal (2001), Sims (2002), Joutz and Stekler (2000), Baghestani (2008) and D'Agostino and Whelan (2008) find either Fed has only a better inflation forecast accuracy or there is no relatively better forecasting performance for GDP or unemployment.

1.3. Has this advantage been reduced in the recent period?

Reifschneider and Tulip (2007) find, with unconditional comparisons, that Greenbook forecasts perform identically to SPF since 1986. D'Agostino and Whelan (2008) and Gamber and Smith (2009) find that the Fed's advantage has declined compared to private forecasters in the recent period. For the former, this advantage holds only for very short horizons, and for the latter conditional advantage has disappeared, but unconditional comparisons still evidence Fed's superiority. This issue is related to whether this advantage comes from the predictable component of inflation or not. Sims (2002) finds the superiority of the Fed on inflation is due to a better forecasting performance of the predictable component of inflation. At the opposite, based on Stock and Watson (2007), the drop in the overall volatility during the Great Moderation comes from the drop in the volatility of the predictable component of inflation, what may explain the narrowing of the Fed's superiority according to Gamber and Smith (2009). Isolating the forecastable component may allow us for disentangling the sources of superior forecasting performance. If the latter is based on a superior forecastable component, it may arise from a superior forecasting model, while if it is based on the specific part of the forecast, we may assume that the superior forecasting performance arises from better information about future shocks.

2. Data Description

2.1. Forecast Data

Forecasts considered are those of the Greenbook and the Survey of Professional Forecasters (SPF hereafter) and both are made available on the web site of the Federal Reserve Bank of Philadelphia. As a measure of inflation, the GDP price deflator is used since it has been consistently forecasted throughout the entire period by both forecasters, compared to the Consumer Price Index for which the definition has changed across time and has started to be forecasted later. We consider the mean of individual responses to each survey. Robustness tests with CPI are nevertheless performed. As commonly used in literature, the real GDP/GNP is the variable considered for the 'growth' forecasts.

The Federal Reserve forecasts come from the Greenbook prepared by the staff of the Board of Governors before each meeting of the FOMC, and they are made available to the public after a five-year embargo. The sample goes from 1965:4 to 2001:4 for both inflation and real GDP/GNP growth at different horizons. The sample stops at the beginning of the 2000's when inflation became very stable and the predictable component of inflation dropped as evidenced by Atkeson and Ohanian (2001), D'Agostino, Giannone and Surico (2006), Campbell (2007) and Stock and Watson (2007). Greenbook forecasts depend on the FOMC schedule and are not available at a quarterly frequency. For instance, there were almost a meeting every month between 1960 and 1970 while eight forecasts per year in the 1980's. We assume the relevant Greenbook forecast of a given quarter is the forecast made in the second month of the quarter, which date is the closest to the 15^{th} day. The timing issue is crucial as Greenbook and SPF forecasts should correspond to the same information set. Inflation and output forecasts are the annualized quarterly growth rate.

The private forecasts are those of SPF and are now conducted by the Federal Reserve Bank of Philadelphia itself. It extends the American Statistical Association/NBER Economic Outlook Survey. It is based on several commercial forecasts made by financial firms, banks, university research centers and private firms and is made in the second month of each quarter. Data is available from 1974:4 for inflation and from 1981:3 for real GDP without missing values

to 2001:4 (we refer to it as the 'full sample' afterwards). Here again forecasts are the annualized quarterly growth rates of the GNP/GDP price deflator and the real GNP/GDP.

2.2. Real-Time versus Final Data

Actual data raise a particular issue. Final data are frequently revised between the different releases and the question is then to know whether comparisons have to be made with the preliminary estimate, second estimate or final estimate. Because some information is not known directly or accounting standards change, the initial estimates are often revised. The advantage of real-time data is that it is close in definition to the variable being forecast. However, final data includes slightly more information. It is reasonable[5] to consider that consistency of definitions is more important than the increase in information and hence prefer to use real-time data.

However, estimations will be performed with both types of actual data in order to check the robustness of the results and assess the importance of this issue for previous different results. The final data is the final-revised data (current vintage) provided by the Bureau of Economic Analysis. Real-time data are those published in the next quarter, called second release data, and come from the Real-Time Data Set for Macroeconomists compiled at the Federal Reserve Bank of Philadelphia.[6] Both series, real-time and final, are computed identically as forecasts: they are annualized quarterly growth rates[7] of real GDP and the implicit GDP price deflator.

3. Estimation Methods

3.1. Unconditional Comparisons

The simplest method to compare the forecast accuracy of both institutions is to measure their Mean Square Errors, which consti-

5. Forecasters attempt to forecast earlier announcements rather than later revisions (see Keane and Runkle, 1990).
6. For details on the Real-Time Data Set, see Croushore and Stark (2001).
7. The series which are already transformed into growth rates are stationary: the null hypothesis that each variable has a unit root is always rejected at the 10% level and most of the time at the 5% level. The investigation is carried out with the Phillips and Perron's Test that proposes an alternative (nonparametric) method of controlling for serial correlation when testing for a unit root. These results are available upon request.

tute unconditional forecast comparisons. In order to calculate the *p-value* for the test of the null hypothesis that Federal Reserve's and SPF's MSE are equal, the following equation is estimated according to Romer and Romer (2000):

$$(\pi_{t+h} - \pi_{t,h}^{GB})^2 - (\pi_{t+h} - \pi_{t,h}^{SPF})^2 = a + \varepsilon_t \quad (1)$$

where π_{t+h} is the actual inflation (or real GDP), either the real-time or the final data, $\pi_{t,h}^{GB}$ is the forecast made in date t for h horizons later by the Federal Reserve, $\pi_{t,h}^{SPF}$ by SPF in date t for h horizons later and α is the difference between the squared errors of forecasts of both institutions and then allows to calculate the standard errors of α corrected for serial correlation with the Newey-West HAC method.[8] We can thus obtain a robust *p-value* for the test of the null hypothesis that $\alpha = 0$, in order to determine whether the forecast errors are significantly different.

3.2. Conditional Comparisons: Regressions

In this section, the purpose is to compare the forecasts of the Federal Reserve with those of SPF with the regression methodology of Fair and Shiller (1989, 1990) and Romer and Romer (2000). The actual inflation is regressed on forecasts made by both institutions in order to know whether the Greenbook forecasts contain information that could be useful to private agents to form their forecasts. The point as described by the authors is to see if "individuals who know the commercial forecasts could make better forecasts if they also knew the Federal Reserve's". The standard regression then follows this form:

$$\pi_{t+h} = \alpha + \beta_{GB} \cdot \pi_{t,h}^{GB} + \beta_{SPF} \cdot \pi_{t,h}^{SPF} + \varepsilon_t \quad (2)$$

The main idea behind this regression is then to see if Federal Reserve forecast contains useful information to forecast inflation and more useful information than the one given by SPF forecasts by testing whether β_{GB} is different from zero, whether β_{GB} is different and higher than β_{SPF}. Standard errors are here again

8. When forecasts for four quarters ahead miss an unexpected change in the variable, this would cause forecasts errors all in the same direction. Forecasts are then declared serially correlated. In order to deal with this issue, standard errors are computed correcting for heteroskedasticity and serial correlation according to the Newey and West's *HAC Consistent Covariances* method. The truncation lag is equal to the forecast horizon.

computed using the Newey-West's HAC methodology to correct serial correlation.

3.3. A Pooled Approach

Based on Davies and Lahiri (1995) and Clements, Joutz and Stekler (2007), this method consists of pooling forecasts across all horizons. The decomposition of forecast errors developed by these authors responds to whether it is adequate to pool the forecast obtained by different models, supposing that maybe forecasts at short and long horizons are not derived from the same models, and in the same manner to pool survey's consensus that represents many individual forecasters.

Because of aggregating horizons, the method needs to deduct the correlation structure across errors of targets and lengths, which is consistent with rationality. The forecast error is:

$$A_{t+h} - F_{t,h} = \alpha + \lambda_{t,h} + \varepsilon_{t,h} \tag{3}$$

where A_{t+h} is the effective value at $t+h$, $F_{t,h}$ is the forecast made at the date t for a horizon of h periods, λ_{t+h} is the aggregate or common macroeconomic shocks which corresponds to the sum of all shocks u_t that occurred between t and $t+h$, and $\varepsilon_{t,h}$ is the idiosyncratic shock. With the possibility for private information, the original formulation becomes:

$$A_{t+h} - F_{t,h} = \alpha + v_{t,h} \tag{4}$$

with $v_{t,h} = \lambda_{t,h} + \varepsilon_{t,h}$. Without private information, the variance of the private component is constant for all h. If the Federal Reserve or SPF has private information, so the idiosyncratic component is absent ($\sigma^2_{\varepsilon} = 0$), what was the variance of macro shocks σ^2_u becomes the global variance of v_{th}.

3.4. One Factor Model

Following Sims (2002), we apply factor analysis to decompose the high correlation between forecasts. It is used to explain the variance which is common to at least two variables and presume that each variable have also an own variance which represents its own contribution. The main assumption is that all forecasters have imperfect observations on a single 'forecastable component' (the

common factor that gathers the strong covariance between forecasts), which they may or may not use optimally. If f^* is the forecastable component of the realized value π_{th}, or of the forecast, π^F_{th} we have the model:

$$\begin{aligned} \pi^F_{th} &= \lambda + \theta f^*_{th} + \varepsilon_{th} \\ \pi_{th} &= \alpha + \beta f^*_{th} + \nu_{th} \\ Var\left(\begin{bmatrix} \varepsilon_{th} \\ \nu_{th} \end{bmatrix}\right) &= \Omega \end{aligned} \tag{5}$$

with Ω diagonal and f^*_{th} orthogonal to ε and ν. In this model, the quality of a forecast is related inversely to the variance of its ε_{th} and to the deviation of its θ coefficients from β. The coefficients are not proportional to the forecast error variances, because they may include a dominant contribution from the variance of ν; the coefficients are inversely proportional to the relative idiosyncratic variances, even if these are an unimportant component of overall forecast error. Sims proposes the possibility of a second component of common variation: a 'common error', but argues that analysis of forecast quality would then be limited and that despite its simplicity the model above provides "a good approximation to the actual properties of the forecasts". This method could indeed allow discriminating between the part of forecast errors which arise from *unforecastable* macroeconomic shocks and the part which comes from idiosyncratic errors. Forecast quality is determined by the variance σ^2 of ε_{th}, the specific variance proper to each forecast once the forecasts correlation has been gathered in a 'forecastable component'.

The interpretation of factor analysis estimates could be difficult in general, but even more in this fit because a simple model with only one factor is obviously not sufficient to explain the pattern in these data. An analysis with multiple factors would give better statistical results, but would be opposed to the main assumption of one forecastable component. Thereby, the likelihood ratio and the *p*-value of acceptable fit are likely to be low because of the deliberate choice and due to the fact that this method is sensitive to serial correlation and non-normality, two characteristics of forecasts.

3.5. Purpose and Relative Advantages of Methods

The most neutral and uncontroversial method to determine forecasting performance is the unconditional comparison of mean square errors. However, in order to assess the *relative* forecasting performance of the Greenbook and private agents, conditional regressions give more insight on the relation between both forecasts and more directly assess the information content of forecasts. This method is thus the most widespread in this specific literature. One shortcoming of this method is that estimates might be polluted by multicollinearity (Table 1 shows correlation among variables). A possible way, proposed by Sims (2002), is to gather the high correlation in a single factor: the forecastable component of a forecast. This method also allows for testing whether the forecasting performance arises from superior forecasts of the forecastable component (which may be related to the accuracy of a model of the economy) or of the specific component (which may be related to more information about future shocks).

Tableau 1. Correlation

Inflation +1 - Final Data			
	Actual	GB	SPF
Actual	1		
GB	0.93	1	
SPF	0.91	0.96	1

Inflation +1 - Real-Time Data			
	Actual	GB	SPF
Actual	1		
GB	0.91	1	
SPF	0.87	0.96	1

Inflation +4 - Final Data			
	Actual	GB	SPF
Actual	1		
GB	0.88	1	
SPF	0.81	0.96	1

Inflation +4 - Real-Time Data			
	Actual	GB	SPF
Actual	1		
GB	0.86	1	
SPF	0.81	0.96	1

Real GNP/GDP +1 - Final Data			
	Actual	GB	SPF
Actual	1		
GB	0.50	1	
SPF	0.49	0.80	1

Real GNP/GDP +1 - Real-Time Data			
	Actual	GB	SPF
Actual	1		
GB	0.47	1	
SPF	0.47	0.80	1

Real GNP/GDP +4 - Final Data			
	Actual	GB	SPF
Actual	1		
GB	0.17	1	
SPF	0.02	0.63	1

Real GNP/GDP +4 - Real-Time Data			
	Actual	GB	SPF
Actual	1		
GB	0.18	1	
SPF	0.08	0.63	1

The full sample goes from 1974:4 for inflation and from 1981:3 for output to 2001:4. GB and SPF forecasts are annualized quaterly percentage changes.

Last, the pooling approach is based on a decomposition of errors and also allows for disentangling aggregate from private forecast errors. The relative forecasting performance analysis focuses on the first two methods (section 4), while sources of superior Greenbook inflation forecasts (section 5) are investigated with the last two.

4. Relative Forecasting Performance

4.1. Are inflation or output Greenbook forecasts superior?

The baseline estimations have been realized on the full sample. Table 2 shows results of the MSE comparison. They are univocal concerning inflation forecasts: when both institutions are compared on the final data basis, Greenbook's MSE are 0.93 and 1.51 respectively at horizons h=1 and 4 while SPF's MSE are 1.25 and 2.46. The *p*-values show that these values are significantly different. The pattern is identical with real-time data. About real GNP/GDP, results are quite clear: the MSEs of Greenbook are comparable to those of SPF and the difference is not significant (with final or real-time data).

Table 2. Mean Squared Errors - Full Sample

Inflation - Final				Inflation - Real Time			
Horizon	**GB**	**SPF**	***p-value***	**Horizon**	**GB**	**SPF**	***p-value***
1	0.930	1.251	0.02	**1**	1.196	1.716	0.00
4	1.517	2.467	0.00	**4**	1.737	2.576	0.00
Real GNP/GDP - Final				**Real GNP/GDP - Real Time**			
Horizon	**GB**	**SPF**	***p-value***	**Horizon**	**GB**	**SPF**	***p-value***
1	6.097	6.234	0.74	**1**	4.612	4.619	0.99
4	6.248	6.519	0.54	**4**	4.727	4.851	0.74

The p-value is for the test of the null hypothesis that the central bank errors and private sector errors are equal.

Table 3 summarizes the results of the benchmark regression. Regarding inflation, this first regression shows first that coefficients on the Greenbook forecasts are significant, while those of SPF are not at any time, and second that β_{GB} is by and large near to one: 0.76 and 0.99 at horizon h=1 respectively for final and real-time data and 1.38 and 1.21 at horizon h=4, while β_{SPF} is next to zero. Concerning real GNP/GDP, the pattern is quite different: when analysing the baseline regression, at the short horizon h=1, both coefficients of Greenbook and SPF are very similar (around 0.6) and significant at the 10% level, for both actual data. At the longer horizon h=4, coefficients of Greenbook and SPF are not significant. In comparison, the inflation results show strong evidence of a better accuracy of the Greenbook's forecasts.

Table 3. Base Regression - Full Sample

Inflation - Final Data			Inflation - Real-Time D		
	Coef	Std Error		Coef	Std Error
Cst	-0.5224**	(0.2593)	Cst	-0.2827	(0.2781)
GB+1	0.7650***	(0.1211)	GB+1	0.9931***	(0.1206)
SPF+1	0.2847*	(0.1514)	SPF+1	-0.0032	(0.1663)
Inflation - Final Data			**Inflation - Real-Time Data**		
	Coef	Std Error		Coef	Std Error
Cst	-0.1855	(0.4520)	Cst	-0.3846	(0.4437)
GB+4	1.3851***	(0.2228)	GB+4	1.2176***	(0.2360)
SPF+4	-0.3781	(0.2434)	SPF+4	-0.1783	(0.2247)
Real GNP/GDP - Final Data			**Real GNP/GDP - Real-Time Data**		
	Coef	Std Error		Coef	Std Error
Cst	-0.3840	(0.8778)	Cst	-0.2863	(0.8996)
GB+1	0.7277*	(0.3701)	GB+1	0.5313*	(0.2976)
SPF+1	0.6422**	(0.3017)	SPF+1	0.6250*	(0.3672)
Real GNP/GDP - Final Data			**Real GNP/GDP - Real-Time Data**		
	Coef	Std Error		Coef	Std Error
Cst	2.7710*	(1.6030)	Cst	1.8915	(1.4741)
GB+4	0.7407	(0.5537)	GB+4	0.5483	(0.4455)
SPF+4	-0.5286	(0.5794)	SPF+4	-0.1878	(0.4457)

Numbers in parentheses are robust standard errors. *,**,*** means respectively significant at 10 %, 5 % and 1 %.

Estimates confirm that the Fed has a significantly better inflation forecasting performance, while not for GDP.[9] The range of possible reasons for the Greenbook's advantage on inflation and not output is large. The weight put on inflation in the central bank loss function might matter: if the Fed greatly balances inflation, it will make everything possible to reach its inflation goal and then *endogenises* inflation by dint of focusing on it. Thus the second variable, the output growth, becomes an adjustment variable, all the more so the Fed attempt to reach its 'implicit' inflation target. It might also be assumed that inflation is easier to measure than output. GDP may be more difficult to forecast because of the uncertainty of future data revisions. Blix, Wadefjord, Wienecke and Adahl (2001) analyze the forecasting performance of 250 major institutions and highlight that growth is much more difficult to forecast than inflation.

Robustness Test: Timing

The timing of the baseline equation is assessed by putting the Greenbook in a deliberate situation of a timing disadvantage. In the benchmark case, forecasts come from the same quarter. Because the date when the forecasts are made in the quarter varies, the Greenbook may sometimes benefit of a possible timing advantage. The equation estimated, in which $\pi^{GB}_{t-1,h+1}$ is the Greenbook forecast made one quarter before SPF and for one quarter later, is:

$$\pi_{t+h} = \alpha + \beta_{GB} \cdot \pi^{GB}_{t-1,h+1} + \beta_{SPF} \cdot \pi^{SPF}_{t,h} + \varepsilon_t \qquad (6)$$

Table 4 exhibits the regression results. Except for final data at short horizon (h=1), coefficients of Greenbook inflation forecasts are significant while those of SPF are not, are always largely superior to those of the SPF, and are included between 0.71 and 0.97, so significantly near to one. The superior forecasting performance seems to be higher when the horizons are longer, whatever the type of actual data.

9. The similar GDP forecasts accuracy between the Fed and private agents could bridge with Tulip (2009) which finds uncertainty is still as high as in 1970s and has been less reduced than volatility.

Table 4. Timing Disadvantage - Full Sample

Inflation - Final Data			Inflation - Real-Time Data		
	Coef	Std Error		Coef	Std Error
Cst	-0.6614**	(0.2651)	Cst	-0.4570	(0.2956)
GB+2	0.4805***	(0.1714)	GB+2	0.7161***	(0.2072)
SPF+1	0.5975***	(0.1969)	SPF+1	0.3121	(0.2323)
Inflation - Final Data*			**Inflation - Real-Time Data***		
	Coef	Std Error		Coef	Std Error
Cst	-0.5284	(0.4824)	Cst	-0.7914	(0.5117)
GB+5	0.9727***	(0.2859)	GB+5	0.9247***	(0.2417)
SPF+4	0.0655	(0.2833)	SPF+4	0.1802	(0.2876)
Real GNP/GDP - Final Data			**Real GNP/GDP - Real-Time Data**		
	Coef	Std Error		Coef	Std Error
Cst	-0.4633	(1.1861)	Cst	-0.0887	(1.0243)
GB+2	0.0719	(0.3882)	GB+2	-0.1880	(0.3083)
SPF+1	1.3057***	(0.3414)	SPF+1	1.2545***	(0.3773)
Real GNP/GDP - Final Data*			**Real GNP/GDP - Real-Time Data***		
	Coef	Std Error		Coef	Std Error
Cst	3.2392*	(1.7349)	Cst	2.2244	(1.5707)
GB+5	0.8660	(0.6184)	GB+5	0.2689	(0.4746)
SPF+4	-0.8467	(0.7725)	SPF+4	-0.0685	(0.6585)

*only 90 obs, because GB don't always publish forecasts at horizon h=5
Numbers in parentheses are robust standard errors. *,**,*** means respectively significant at 10 %, 5 % and 1 %.

Robustness Test: Multicollinearity

Univariate regressions of the realized inflation on one forecast at a time are estimated to check that the benchmark regression is not distorted by multicollinearity as discussed by Granger and Newbold (1977):

$$\pi_{t+h} = \alpha + \beta_{GB\ or\ SPF} \cdot \pi_{t,h}^{GB\ or\ SPF} + \varepsilon_t \qquad (7)$$

The statistical indicator of the explanatory power of the model (the R^2) with Greenbook forecasts is compared to the one of private forecasts, so as to ensure that estimates of the main regression are confirmed when forecasts are compared one by one and not together. It may also be informative to have a look at the coefficient $\beta_{GB\ or\ SPF}$. On table 5, one can observe that the R^2 is consistently higher for the Greenbook inflation forecasts compared to the SPF ones, the gap rising when the horizon is longer, whatever actual data are.

Table 5. Multicollinearity - Full Sample

Inflation - Final Data - 1974:4-2001:4			Inflation - Real Time Data - 1974:4-2001:4		
	Coef	Adj. R^2		Coef	Adj. R^2
GB+1	1.019*** (0.05)	**0.87**	**GB+1**	0.990*** (0.06)	**0.83**
SPF+1	1.071*** (0.06)	0.83	**SPF+1**	1.018*** (0.08)	0.76
GB+4	1.061*** (0.12)	**0.77**	**GB+4**	1.065*** (0.12)	**0.74**
SPF+4	1.095*** (0.17)	0.66	**SPF+4**	1.117*** (0.16)	0.66
Real GNP/GDP - Final Data - 1981:3-2001:4			**Real GNP/GDP - Real Time - 1981:3-2001:4**		
	Coef	Adj. R^2		Coef	Adj. R^2
GB+1	1.147*** (0.31)	0.25	**GB+1**	0.939*** (0.26)	0.21
SPF+1	1.349*** (0.34)	0.23	**SPF+1**	1.141*** (0.32)	0.21
GB+4	0.489 (0.51)	0.02	**GB+4**	0.459 (0.45)	0.02
SPF+4	0.080 (0.65)	-0.01	**SPF+4**	0.262 (0.57)	-0.01

Numbers in parentheses are robust standard errors. *,**,*** means respectively significant at 10%, 5% and 1%.
The dependant variable is noted above each subtable. The constant has been removed from the table.

Robustness Test: Additional information beyond a lagged dependent variable

The purpose of this test is to assess whether the coefficient associated to Greenbook or private forecasts are significant because they are highly correlated to realizations or because they provide additional information besides the information set known at the date when the forecast is made. Assuming that a lagged dependent variable – the actual data – comprises all the information available when the forecast is made, the following equation enables to assess whether the forecast really contains superior forward looking information:

$$\pi_{t+h} = \alpha + \beta_{\pi} \cdot \pi_{t-1} + \beta_{GB} \cdot \pi_{t,h}^{GB} + \beta_{SPF} \cdot \pi_{t,h}^{SPF} + \varepsilon_t \qquad (8)$$

Table 6 presents the estimates of the regression with the lagged dependent variable. They strongly confirm the previous results: the coefficient associated to Greenbook's inflation forecasts is

significant for either final or real time data, at both one and four quarter horizons.

Table 6. Regressions with lagged dependent variable - Full Sample

Inflation					
Final Data			Real-Time Data		
	Coef	Std Error		Coef	Std Error
Cst	-0.495*	(0.274)	Cst	-0.352	(0.299)
AR(1)	0.031	(0.101)	AR(1)	-0.031	(0.129)
GB+1	0.736***	(0.147)	GB+1	0.950***	(0.134)
SPF+1	0.277	(0.167)	SPF+1	0.087	(0.211)
Cst	-0.109	(0.417)	Cst	-0.343	(0.419)
AR(1)	-0.006	(0.146)	AR(1)	-0.001	(0.142)
GB+4	1.478***	(0.248)	GB+4	1.312***	(0.210)
SPF+4	-0.480	(0.241)	SPF+4	-0.269	(0.249)
Real GDP					
Final Data			Real-Time Data		
	Coef	Std Error		Coef	Std Error
Cst	0.357	(0.724)	Cst	0.264	(0.942)
AR(1)	0.303***	(0.078)	AR(1)	0.086	(0.099)
GB+1	0.327	(0.306)	GB+1	0.236	(0.177)
SPF+1	0.449	(0.319)	SPF+1	0.664*	(0.362)
Cst	2.792*	(1.565)	Cst	1.597	(1.309)
AR(1)	0.002	(0.106)	AR(1)	-0.004	(0.122)
GB+4	0.746	(0.626)	GB+4	0.368	(0.516)
SPF+4	-0.580	(0.646)	SPF+4	0.086	(0.487)

Numbers in parentheses are robust standard errors. *,**,*** means respectively significant at 10 %, 5 % and 1 %.

Robustness to an Alternative Inflation Variable

An argument may be that private agents are more prone to forecast the Consumer Price Index (CPI) than the GDP price deflator, and this might be a reason for their less accurate performance in forecasting inflation. In order to check the robustness of the previous results for inflation, additional tests with CPI are then provided. Data are available from the same sources from 1982Q1 to 2001Q4. Table 7 displays evidence that confirms the previous results and show that the variable chosen for inflation, GDP deflator or consumer inflation, does not lead to reconsider the relatively better accuracy of Greenbook forecasts.

Table 7. Robustness: CPI - 1982:1 - 2001:4

Mean Square Errors			
Horizon	**GB**	**SPF**	***p-value***
1	4.510	4.770	0.443
4	4.137	4.498	0.018

Regressions					
Base					
	Coef	**Std Error**		**Coef**	**Std Error**
Cst	0.855	(0.819)	**Cst**	1.271	(0.819)
GB+1	1.066*	(0.644)	**GB+4**	1.109**	(0.469)
SPF+1	-0.391	(0.775)	**SPF+4**	-0.553	(0.533)
Timing Disadvantage					
	Coef	**Std Error**		**Coef**	**Std Error**
Cst	1.489	(1.033)	**Cst**	1.226	(0.991)
GB+2	1.131***	(0.261)	**GB+5**	1.275*	(0.747)
SPF+1	-0.672	(0.522)	**SPF+4**	-0.710	(0.827)
Multicollinearity					
	Coef	**Adj. R^2**		**Coef**	**Adj. R^2**
GB+1	0.775*** (0.193)	0.140	**SPF+1**	0.739*** (0.261)	0.085
	Coef	**Adj. R^2**		**Coef**	**Adj. R^2**
GB+4	0.643*** (0.191)	0.102	**SPF+4**	0.596*** (0.224)	0.068
with Lagged Dependent Variable					
	Coef	**Std Error**		**Coef**	**Std Error**
Cst	0.744	(0.840)	**Cst**	1.444	(1.001)
AR(1)	-0.118	(0.158)	**AR(1)**	-0.181*	(0.104)
GB+1	0.878	(0.571)	**GB+4**	1.397***	(0.497)
SPF+1	-0.058	(0.716)	**SPF+4**	-0.722	(0.672)

*,**,*** means respectively significant at 10%, 5% and 1%.
Numbers in parentheses are robust standard errors.

Robustness to the Actual Data Issue

The superiority of the Greenbook forecasts is more pronounced with real-time data. However, in the end, whatever inflation data considered are real-time or final, the results give similar indications on the Greenbook's superior forecasting performance, and tend to support that relative forecast accuracy here is not subject to variation in data definitions. Furthermore, an identical scheme emerges from all methodologies: Fed and SPF better forecast real-

time value of real GDP while they both have more accurate predictions of final data of inflation. One possible explanation may come from the method of constructing the GDP aggregate and the assumption about the growth trend which are often revised. The advantage of real-time data is that it is close in definition to the variable being forecast.

Finally, it consistently appears from the benchmark estimation and the robustness tests that the longer the horizon, the more pronounced the advantage of the Greenbook on inflation. With longer horizons, the uncertainty is greater and the fact that the superiority of Greenbook forecasts increase tends to confirm that the advantage is robust and not due to timing advantage and/or access to information on the short run.

4.2. Has this advantage on inflation reduced in the recent period?

We focus in this section on inflation forecasts for which there is evidence of superior forecasting of the Greenbook over the full sample. Unconditional comparisons and the benchmark conditional regression are estimated on a reduced sample to take into account the choice of Atkeson and Ohanian (2001) to rule out the period of strong disinflation of the beginning of the eighties. Due to the private agents' idea that the Federal Reserve will not succeed to reduce inflation, Greenbook forecasts could have been better than private forecasts. The first sub-sample starts in 1987Q3 when Greenspan took his function. The end of the sample is still 2001Q4. In the same manner, D'Agostino and Whelan (2008) and Gamber and Smith (2009) show that with the drop in volatility in predictable component of inflation and greater transparency of the Fed since 1992 and 1994, the superior forecasting performance of the Fed has been reduced. We therefore estimate the regression on two other sub-samples starting in 1992Q1 and 1994Q1 in order to assess the Greenbook's forecasting superiority on samples during which the US monetary policy regime was stable and inflation expectations became fairly well anchored.

Table 8 reveals the coefficients of the regression made on smaller samples. Estimates show a different picture: if we consider the largest subsample, from 1987 to 2001, it appears that outcomes are in line with the previous ones: Greenbook inflation coefficients are significant and close to one at both horizons (while not for the

SPF). However, when considering the two other subsamples starting in 1992 or 1994 as D'Agostino and Whelan (2008) and Gamber and Smith (2009) respectively do, it appears that the coefficient of Greenbook forecasts is not significant anymore. These two estimations are nevertheless based on smaller samples and so fewer observations as emphasized by Gamber and Smith (2009). In addition, these subsamples comprise a very stable period for which conditional comparisons lack variability. This calls for assessing forecast accuracy with unconditional comparisons.

Table 8. Inflation Forecasts - Smaller Sample Periods

	Final Data		Real-Time Data	
	1987Q3-2001Q4			
	Coef	Std Error	Coef	Std Error
Cst	-0.049	(0.378)	-0.534	(0.433)
GB+1	0.533***	(0.198)	0.831***	(0.206)
SPF+1	0.346	(0.208)	0.215	(0.193)
	Coef	Std Error	Coef	Std Error
Cst	0.229	(0.554)	-0.484	(0.653)
GB+4	0.804**	(0.395)	0.945***	(0.346)
SPF+4	-0.015	(0.450)	0.086	(0.431)
	1992Q1-2001Q4			
	Coef	Std Error	Coef	Std Error
Cst	0.916*	(0.479)	0.623	(0.682)
GB+1	0.158	(0.317)	0.268	(0.243)
SPF+1	0.271	(0.385)	0.243	(0.401)
	Coef	Std Error	Coef	Std Error
Cst	1.772**	(0.700)	0.788	(0.969)
GB+4	0.132	(0.603)	0.389	(0.484)
SPF+4	-0.065	(0.447)	0.054	(0.457)
	1994Q1-2001Q4			
	Coef	Std Error	Coef	Std Error
Cst	1.149**	(0.491)	0.817	(0.736)
GB+1	0.202	(0.358)	0.395	(0.301)
SPF+1	0.113	(0.431)	0.024	(0.496)
	Coef	Std Error	Coef	Std Error
Cst	2.547***	(0.804)	1.747	(1.066)
GB+4	0.254	(0.595)	0.425	(0.407)
SPF+4	-0.533	(0.520)	-0.411	(0.500)

*,**,*** means respectively significant at 10%, 5% and 1%.
Numbers in parentheses are robust standard errors.

Tables 9 and 10 present the Mean Square Errors for respectively GDP deflator and CPI on the three shorter subsamples and shows that Greenbook inflation forecasts errors remains smaller than SPF ones and this result is still more pronounced at the longer horizon (4 quarters ahead). Greenbook's four quarter ahead forecasts outperform SPF ones more for GDP deflator than for CPI. One potential explanation may be that the private forecasters pay closest attention in the recent period to consumer inflation, while the Greenbook provides more accurate forecasts for the other components of GDP. This paper confirms that the gap between the Greenbook and private forecasters has narrowed in the recent period but the Fed still preserves a superior forecasting performance.

Table 9. Mean Squared Errors - Smaller Sample Periods

Inflation - Final				Inflation - Real Time			
1987Q3-2001Q4							
Horizon	**GB**	**SPF**	***p-value***	**Horizon**	**GB**	**SPF**	***p-value***
1	0.641	0.761	0.247	**1**	0.790	1.013	0.059
4	0.670	1.121	0.000	**4**	0.796	1.298	0.0002
1992Q1-2001Q4							
Horizon	**GB**	**SPF**	***p-value***	**Horizon**	**GB**	**SPF**	***p-value***
1	0.626	0.672	0.648	**1**	0.798	0.891	0.343
4	0.639	1.094	0.001	**4**	0.745	1.297	0.002
1994Q1-2001Q4							
Horizon	**GB**	**SPF**	***p-value***	**Horizon**	**GB**	**SPF**	***p-value***
1	0.678	0.696	0.892	**1**	0.817	0.893	0.527
4	0.759	1.146	0.017	**4**	0.872	1.352	0.018

The p-value is for the test of the null hypothesis that the central bank errors and private sector errors are equal.

Table 10. Mean Square Errors: CPI - Smaller Sample Periods

	1987:3 - 2001:4			1992:1 - 2001:4			1994:1 - 2001:4		
	GB	**SPF**	***p-val***	**GB**	**SPF**	***p-val***	**GB**	**SPF**	***p-val***
h=1	3.867	3.798	0.706	3.493	3.521	0.898	3.956	4.074	0.650
h=4	3.555	3.788	0.071	3.585	3.820	0.098	4.082	4.253	0.274

The p-value is for the test of the null hypothesis that GB's errors and SPF's errors are equal.

5. Sources of Superior Inflation Forecasts

Many arguments have been put forward in the literature to explain the superior forecasting performance of the Greenbook: *(i)* the institutional and inherent advantage possessed by the central bank about its own future policy path, *(ii)* secrecy provides to the Fed a relative enhanced information set compared to private forecasters, *(iii)* the knowledge derived from the role of supervisor and regulator of banks (Peek, Rosengren and Tootell (1998) and (2003)), *(iv)* an expertise advantage leading Sims (2002) to argue that "the Fed is simply making better use than other forecasters of the same collection of aggregate time series available to all", *(v)* the fact that as reported by Romer and Romer (2000) the Fed succeeds in collecting better and larger detailed information about determinants of future inflation, thanks to the amount of resources the Fed devotes to it relative to firms or banks.

Poole, Rasche, and Thornton (2002) and Swanson (2006) show based on market expectations of the fed funds rate that US markets are rarely surprised by the Fed at very short horizons as a few weeks. For longer horizon, the performance of market expectations is poorest, which may support the argument *(i)*. However, Hubert (2014b) shows that prior knowledge of the future policy path is not a sufficient condition to benefit from a superior forecasting performance. In addition, interest rate paths result from macroeconomic forecasts and are in fact endogenous to the specific expertise of the central bank.

Concerning the argument *(iii)*, Peek, Rosengren and Tootell (1998, 2003) suggest the Fed obtains an exploitable informational advantage from its supervisory role and more specifically from non market traded banks, for which the data are confidential and remain so for a significant period of time. These works could be put together with the ones of Kashyap and Stein (1994a, 1994b, 2000) finding small banks may be particularly important for the level of economic activity because they disproportionately lend to finance inventories and small business. Thus, all information that could be gathered from this side is 'unavailable' to private sector and seems useful and used by the Fed via its supervisory role.

Although networks allow information to circulate very quickly and the hypothesis that the financial markets properly aggregate

information, the argument of a specific expertise either on the right model of the economy *(iv)* or in a better gathering and processing of information *(v)* seems relevant for several reasons. First, despite recent huge progresses in the information process, coordination, uncertainty, heterogeneity of information processing capacities and noisy signals are still rendering information imperfect as the thriving literature on those subjects attests; second, Bernanke and Boivin (2003)[10] develop a data-rich environment model that confirms aggregation and exploitation of a very large amount of data has an added-value for monetary policy analysis. Third, Faust and Wright (2009) show that Greenbook inflation forecasts dominate large dataset methods. The main issue is therefore to assess whether the Fed has a better model of the economy (and makes a better use of public data) or has superior (private) information.

Predictable component or specific errors?

A factor model and a pooling approach are used to test whether the forecasting performance arises from superior forecasts of the forecastable component (which may be related to the accuracy of the model of the economy) or of the specific component (which may be related to more information about future shocks). It might be argued that a better model of the economy produces low idiosyncratic errors or that private information enhances the forecastable component. The main assumption is that generally a better model improves relatively more the common forecastable component, the technical element, while better private information improves relatively more the specific component, the judgmental one.

Table 11 presents the estimates of the factor analysis[11] on the full sample. The model based on the hypothesis of a common and unique forecastable component ascribes a high coefficient θ to the forecastable component to both Greenbook and private forecasts,

10. Their analysis besides compare the forecasting performance of the Greenbook to their data-rich model: FM-VAR and to combination of the Greenbook and their model. They find Greenbook does marginally worse than FM-VAR for next quarter's inflation (CPI here) forecast and better for longer horizons, while unemployment forecasts are comparable. These outcomes appear to be in line with those found here. The combination forecasts have broadly similar (verily better) forecasting performance than Greenbook forecasts.

11. The naive forecast series is added in order to get a benchmark in the one factor model. This series corresponds to static forecasts, i.e. the value at the date t is the forecast at the date t+1.

and a low idiosyncratic error σ^2 to Greenbook forecasts compared to naïve and SPF forecasts. While at a short horizon h=1, the difference is weak (as in the Sims' paper), the difference at horizon h=4 is clear for inflation with both actual data. These results suggest that the forecast accuracy of Greenbook inflation forecasts arises from their low idiosyncratic error.

Table 11. One Factor Model

	Inflation - Final Data				Inflation - Real-Time Data			
	Horizon h=1		Horizon h=4		Horizon h=1		Horizon h=4	
	θ	σ^2	θ	σ^2	θ	σ^2	θ	σ^2
Actual	0.94	0.11	0.88	0.22	0.92	0.16	0.87	0.25
GB	0.98	**0.04**	0.99	**0.01**	0.99	**0.03**	0.99	**0.01**
SPF	0.98	0.05	0.96	0.08	0.97	0.06	0.96	0.08
Naïve	0.93	0.13	0.89	0.20	0.90	0.18	0.88	0.22
	N_obs	109	N_obs	109	N_obs	109	N_obs	109
	log LH	-0.048	*log LH*	-0.291	*log LH*	-0.116	*log LH*	-0.179
	p-value	0.079	*p-value*	0.000	*p-value*	0.002	*p-value*	0.000

θ is the coefficient associated to the forecastable component and σ^2 is the variance of the forecast error.
Results are from the estimation of the model described in equations 5 in the text.

This result is confirmed by pooling approach estimates in table 12, which show that Greenbook global errors are smaller than SPF ones, under the assumption that either the Greenbook or the SPF has private information. In addition, pooling approach estimates also confirm that both the bias and the absolute error of Greenbook forecasts are smaller.

Under the assumption that the forecastable component is related to the accuracy of a model of the economy) and that the specific component is related to information about future shocks, then the preceding estimates suggest the source of superior Greenbook forecasts stems from better information about future shocks. The result of Stock and Watson (2007) that inflation has become harder to forecast and that the predictable component of inflation has dropped is consistent with the decrease of the Greenbook's superiority in the recent period but should have a negligible effect on the relatively better forecasting performance of the Fed, as its main source of superior forecasts seems to be its information set about future shocks. This is consistent with the intuition that the

decline in the predictable component of inflation affects all forecasters and not only the Fed.

Table 12. Forecasts Pooled over Horizon (current and next 4 quarters)

					Idiosyncratic component		No Idiosyncratic component			
			Bias: α	*RMSFE*	*se(α)*	*p-val*	*se(α)*	*p-val*	σ^2_ε	σ^2_u
Inflation	**Final Data**	**GB**	-0.28	1.07	0.13	0.03	0.17	0.09	0.53	0.18
		SPF	-0.48	1.29	0.17	0.01	0.20	0.02	0.46	0.33
	Real-Time Data	**GB**	-0.27	1.16	0.13	0.05	0.18	0.14	0.69	0.20
		SPF	-0.47	1.37	0.16	0.00	0.21	0.02	0.80	0.28

Tests of the null of no bias in forecast errors, common bias assumed. The p-values are the probability that the null is true. If the idiosyncratic component is absent ($\sigma^2_\varepsilon = 0$), the variance of the macro shock σ^2_u becomes the global variance of v_{th}. If the idiosyncratic component is present, σ^2_u is the variance of macro shocks.

Two explanations for the decrease of the Fed superiority may be that the inflation rate has flattened out with the Great Moderation and lagged inflation now evolves around the Fed's target, compared to the previous period when inflation was on a downward trajectory and private sector were learning slowly the Fed's target; or that enhanced transparency of the Fed may disclose a part of its private information about future shocks.

6. Conclusion

This paper assesses the relative forecasting performance of the Greenbook and the private sector in the US. The results are fourfold: first, on the full sample, the Greenbook possesses a superior forecasting performance on inflation, but not on output. Second, it appears that the longer the horizon, the more pronounced the advantage on inflation. This tends to confirm the advantage is sound. Third, estimates show that this advantage is decreasing but remains prominent when considering very short and recent subsamples. Fourth, the Greenbook's better forecasting performance seems to stem from superior information.

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