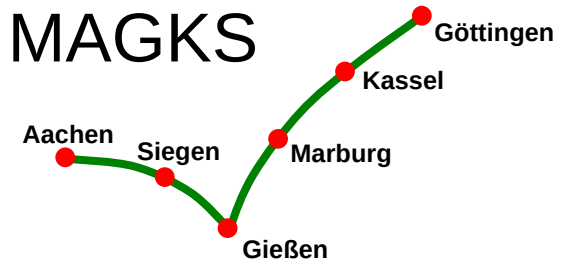

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Strategic Forecasting on the FOMC

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May 20, 2010

Abstract: The Federal Open Market Committee (FOMC) of the Federal Reserve consists of voting- and non-voting members. Apart from deciding about interest rate policy, members individually formulate regular inflation forecasts. This paper uncovers systematic differences in individual inflation forecasts submitted by voting and non-voting members. Based on a data set with individual forecasts recently made available it is shown that non-voters systematically overpredict inflation relative to the consensus forecast if they favor tighter policy and underpredict inflation if the favor looser policy. These findings are consistent with non-voting member following strategic motives in forecasting, i.e. non-voting members use their forecast to influence policy deliberation.

Keywords: inflation forecast, forecast errors, monetary policy, monetary committee, Federal Reserve

JEL classification: E43, E52

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1 Introduction

At almost all major central banks monetary policy is set not by a single decision maker but by a monetary policy committee of experts. At the U.S. Federal Reserve, for example, monetary policy decisions are taken by the Federal Open Market Committee (FOMC). These committees often consist of members with heterogeneous preferences, different backgrounds and career concerns as well as different regional and institutional affiliations. Only recently, the diversity of committee members' preferences and views is studied in the academic literature.[2] A number of studies, for example, studies the pattern of formal dissent of FOMC members, the role of the chairman for policy deliberation, and the differences between outsiders and insiders.[3]

An important aspect of policymaking by committees in the presence of heterogeneity is strategic behavior of committee members. One aspect where strategic behavior is likely to surface is the process of forecasting inflation. Although the Federal Reserve is not an official inflation targeter, its inflation forecast is likely to be important for communication with the public. Strategic behavior of members in this forecasting process has only been studied very recently by Ellison and Sargent (2009), whose important contribution will be discussed below. This paper closes this gap. A recent compilation of data on individual inflation forecasts by each FOMC members allows the researcher to investigate whether members use their forecast to give the policy debate a twist in a particular direction. Take as an example a member that is hawkish on inflation. Will this member submit a somewhat higher inflation rate than the remaining members in order to gear policy towards tightening? The crucial cross-sectional property to identify strategic behavior is the right to vote on interest rate policy that rotates across members. We understand strategic forecasting as a systematic relationship between the inflation forecast and the voting status. The

[2] See Blinder (2009) for a recent survey on the the implications of alternative designs of monetary policy committees for interest rate policy.

[3] A complete survey of the literature is beyond the scope of this paper. To give just a few references, see Blinder and Morgan (2005), Chappell et al. (2007), and Gerlach-Kristen (2008) for research on the role of the chairman in monetary policy committees. Riboni and Ruge-Murcia (2010) find in an empirical analysis that the consensus voting model fits most central bank policies best. Meade (2005) and Gerlach-Kristen and Meade (2010) study the incentives for formal dissent by FOMC members. Meade and Stasavage (2008) find that releasing transcripts of FOMC meetings changes the incentive for dissent. Gerlach-Kristen (2009) shows interesting differences between outsiders and insiders in the Bank of England's monetary policy committee in the pattern of dissent and their policy preferences.

assumption is that using the inflation forecast to influence policy deliberations and communication is more attractive for non-voting members that for voting members. To uncover strategic behavior of FOMC members, therefore, we exploit the rotating nature of members' voting rights. The underlying assumption is that strategic motives are more relevant for members without the right to vote on interest rate policy. These members should instead use their semiannual forecast to influence policy deliberation. The empirical strategy identifies systematic differences between voters and non-voters in their forecasting behavior. It is shown that non-voters deviate more strongly from the forecast consensus in the direction consistent with their interest rate preference. Non-voters who expressed a preference for a looser policy stance systematically submit forecasts lower than the committees average forecast. Non-voters with a preference for a policy tightening, in contrast, systematically exceed the forecast consensus by about 20 basis points.

While strategic behavior of macroeconomic forecasters received some attention in the literature, the issue of strategic forecasting of FOMC members has not yet been studied due to the non-availability of data. The compilation of individual forecasts submitted by each FOMC member for selected years by Romer (2009) makes it possible to take a first step into this direction. Thus far only the range of forecasts are published, not the individual numbers.

This paper is organized as follows. A brief review of the related literature is given in section two. Section three presents the data set on individual FOMC inflation forecasts. The empirical strategy and the results are discussed in section four. Section five draws some tentative conclusions.

2 The literature on strategic forecasting

The literature provides evidence supporting the notion of strategic behavior of macroeconomic forecasters. Laster, Bennett and Geoum (1999) find that professional forecasters whose wage depend most on publicity produce forecasts that differ most from the consensus. Lamont (2002) and Pons-Novell (2003) test the cross-sectional implications of theories of strategic forecasting. The null hypothesis is that the dispersal of forecasts is unrelated to the forecaster's age or other measures of reputation or career concerns. They find that as forecasters become older and more established, they produce more radical forecasts. Based on a panel of Japanese GDP forecasts,

Ashiya (2009) finds that forecasters are concerned about publicity when submitting their forecast. Based on the method of Bernhardt et al. (2006), Pierdzioch et al. (2010) test for strategic behavior of oil-price forecasters. They find evidence of anti-herding, i.e. forecasts are systematically biased away from the forecast consensus. Evidence against a rational bias in macroeconomic forecasts due to reputational or financial incentives is presented by Batchelor (2007).[4]

As mentioned in the introduction, strategic forecasting of policymakers has not yet received particular attention - mostly due to the non-availability of data. Nevertheless, three papers are particularly relevant in this context. First, Capistran (2008) points to systematic forecast errors of Greenbook forecasts. He offers an explanation in terms of an asymmetric loss function for forecasters. He finds that in the post-Volcker era the Fed's cost of under-predicting inflation was four times the cost of over-predicting. Second, the recent note by McCracken (2010) is close to this paper. He also pursues the idea of strategic forecasting on the FOMC and argues that hawkish members have an incentive to forecast high inflation in order to underlie the need for tighter policy. He finds that for inflation, the midpoint of the trimmed range, i.e. the outlier-adjusted range, is more accurate that the midpoint of the full range. Put differently, controlling for outliers improves the accuracy of the FOMC's inflation forecast. Arguably, the behavior described by McCracken (2010) is more relevant for non-voters than for voters. To uncover strategic behavior of FOMC members, therefore, we exploit the rotating nature of members' voting rights. While McCracken (2010) uses the range of forecasts, we base our study on a data set with individual inflation forecasts recently made available.

Third, Ellison and Sargent (2009) argue that aggregate FOMC forecasts are not meant to be accurate descriptions of the most likely future inflation outcome, but rather worst-case scenarios used to guide policy in the presence of model misspecifications. Policymakers put greater weight on adverse outcomes, i.e. inflation being further away from target, than the staff or external forecasters. We can conclude from this study that, first, inflation forecasts matter as an important input for policy and, second, that individual FOMC members might use these forecasts strategically according to their own degree of model uncertainty which is not necessarily shared by fellow members.

[4] Ehrbeck and Waldmann (1996) provide evidence in favor of behavioral models explaining the forecast bias. A theoretical model of strategic behavior of professional forecasters is developed by Ottaviani and Sorensen (2005).

3 FOMC forecasts

Monetary policy in the U.S. is set by the Federal Open Market Committee. It consists of the Washington D.C. based governors of the Federal Reserve board, the Chairman of the board of governors and the Presidents of the regional Federal Reserve Banks. While all regional presidents take an active part in the policy deliberation, the formal voting right rotates across Federal Reserve districts. Only the board members, the chairman and, as an exception to the rotation scheme, the president of the Federal Reserve Bank of New York are always eligible to cast a vote on monetary policy. While only a subgroup of members votes on interest rate policy, all FOMC members regularly submit forecasts for important macroeconomic variables including the rate of inflation. This rotating voting right is the decisive pattern used in this paper to identify strategic motives in forecasting.

Twice a year at its February and July meetings the FOMC publishes the monetary policy report to congress (Humphrey-Hawkins report).[5] Each FOMC member submits her own forecasts, after intensive briefing by the Board staff. Until recently, however, individual forecasts were kept secret. The published report only contains a range of forecasts and the midpoint of this range, also known as the central tendency.[6]

Recently, the Fed makes data on individual FOMC forecasts available for selected years. Based on these releases, Romer (2009) constructs a data set containing forecasts for the period 1992-1998.[7] The data set contains forecasts from board members as well as from voting and non-voting regional Federal Reserve Bank presidents. It does not, however, contain forecasts from the chairman.

In the July report, the FOMC prepares forecasts five quarters ahead and one quarter ahead. The February report contains forecasts for the variables three quarters ahead. The inflation forecast is the expected fourth-quarter-to-fourth-quarter change of the Consumer Price Index. All forecasts are supposed to be conditional on each member's

[5] Recently, the frequency was increased to four forecasts per year.

[6] These data received some attention in recent years. Gavin (2003) evaluates the information content of the central tendency and the FOMC's forecasting record, while Gavin and Mandal (2003) compare forecast accuracy between the FOMC, the private sector, and the staff. Likewise, Romer and Romer (2008) contrast FOMC forecasts with Federal Reserve staff forecasts. Gavin and Pande (2008) use data from the survey of professional forecasters to mimic the FOMC's forecasting method and analyse the different measures of forecast consensus.

[7] All data series about FOMC forecasts used in this paper are available at David Romer's website under `http://elsa.berkeley.edu/~dromer/`.

own judgement of the "appropriate policy" path over the forecast horizon.
For each of the three different forecasts per year, i.e. one at the February meeting and two at the July meeting, the data set contains forecasts for inflation for seven years and 18 FOMC members. Since a couple of FOMC seats were vacant in the sample period and we cut the sample to match the data on member specific policy preferences discussed below, we end with about 100 inflation forecasts for each forecast horizon ranging from 1992 to 1997. Certainly, the short time period remains a serious restriction to empirical research.

4 Empirical strategy and results

The basic idea of this paper is that members' inflation forecasts are in line with their policy preferences and that, most importantly, this link is stronger for nonvoting than for voting members. To test this hypothesis, we proceed in two steps. First, we test whether deviations from the committee's consensus forecast can be explained by each participant's voting status. Second, we go one step further and ask whether deviations are related to each member's voiced preference for the monetary policy stance and, most importantly, whether this relationship is particularly relevant for non-voting members. While voting members can use their vote and, related to this, their increased media and policy attention to affect policy, non-voters might resort to strategic forecasting.[8]
Let us first study the nature of deviations of forecasts from the FOMC's consensus forecast. We construct the empirical specification along the lines of Lamont (2002) and Pons-Novell (2003, 2004). Let $E_t^i \pi_{t+h}$ denote member i's period t forecast for inflation h quarters ahead. The mean forecast for the remaining committee members, that is all members apart from member i, is $E_t^{mean} \pi_{t+h}$. To the extent non-voters use their forecast in order to influence policy deliberation, their forecast should be further away from the consensus forecast than the forecast of voting members. We test this by regressing the absolute difference between $E_t^i \pi_{t+h}$ and $E_t^{mean} \pi_{t+h}$ on a constant β_0 and a dummy that indicates the voting status

$$\left| E_t^i \pi_{t+h} - E_t^{mean} \pi_{t+h} \right| = \beta_0 + \beta_1 NonV_t^i + \varepsilon_t \tag{1}$$

[8] In fact, Hayo et al. (2008) show that voting members' public speeches affect financial markets more than non-voting members'.

where $NonV_t^i$ takes a value of one if member i is a non-voting member and is zero otherwise.

The results of this specification for three alternative forecast horizons are presented in table (1). We also report results for two narrower groups of members containing (i) only regional Federal Reserve bank presidents and (ii) excluding the president of the Federal Reserve Bank of New York who does not participate in the rotation scheme. The results are mixed. For the three quarters-ahead forecasts we consistently find $\beta_1 > 0$, i.e. a larger deviation from the consensus for non-voters. The difference between non-voters and voters, although substantial, is not statistically significant.[9]

One straightforward reason for the insignificant results is the fact that specification (1) cannot distinguish whether non-voting members have a preference for looser or tighter policy and, hence, under- or overpredict inflation relative to the consensus forecast. In fact, in this specification differences in the direction of strategic forecasting are washed out.

Therefore, in a second step we enrich the model by including a measure of the policy preferences, $FFPref_{t-1}^i$, for each member. This is the decisive difference of this paper to other contributions with respect to the literature on strategic forecasting. Most studies on the behavior of professional macroeconomic forecasters can only relate absolute deviations from the consensus to individual characteristics of forecaster i. They cannot, however, distinguish a rationale for overpredicting inflation from a motive for underprediction.

To avoid an endogeneity problem, the measure of policy preferences is derived from member i's voiced preferences at the preceding meeting, i.e. at the December meeting for the $h = 3$ forecasts submitted in February and at the May meeting for the $h = 1$ and $h = 5$ quarters forecasts formulated at the July meeting. The empirical specification now is

$$\begin{aligned} E_t^i \pi_{t+h} - E_t^{mean} \pi_{t+h} &= \beta_0 + \beta_1 NonV_t^i + \beta_2 FFPref_{t-1}^i \\ &\quad + \beta_3 NonV_t^i \times FFPref_{t-1}^i + \varepsilon_t \end{aligned} \tag{2}$$

The interaction term is crucial. If $\beta_3 > 0$, nonvoting members adjust their forecast stronger into the direction of intended policy than voters do. This would be consistent with strategic forecasting. Obviously, measuring policy preferences on an individual

[9] Consistent with these findings, Banternghansa and McCracken (2009) show only weak evidence for the conjecture that the level of disagreement among FOMC members varies with the voting status.

level is difficult. Here we utilize the data set constructed by Meade (2005).[10] She uses transcripts of FOMC meetings and codes verbally stated preferences into a dummy variable that takes a value of 1 if a member favors tighter policy, -1 in case of policy easing and zero otherwise. Hence we have a variable at hand that fits our purpose of indicating the preferences for interest rate policy for each FOMC member very well. Due to some data problems the samples do not perfectly overlap. Hence, we loose a handful of observations.[11]

The results are reported in table (2). The policy preference does not have an impact on forecasts per se. In other words, members cast a sincere forecast that is unrelated to their preferences. In all specifications, however, we find $\beta_3 > 0$. In other words, non-voters adjust their forecasts in the intended direction. Take the three quarter-ahead forecast submitted at the February meeting. The policy preference dummy is not significant in general. For non-voters, however, it is strongly significant. Non-voters who favor tighter policy submit a forecast that is about 20 basis points, i.e. $\beta_2 + \beta_3$, higher than voters. Put differently, take two hawkish members that differ in their voting status. The nonvoting member is more likely to submit a more pessimistic (i.e. higher) inflation forecast relative to the consensus than the voting member.

As a robustness check, we use two alternative measures of forecast consensus. The first is the median forecast of inflation across members, see table (3). All results are qualitatively unchanged. Since all FOMC members have access to the latest set of Federal Reserve staff forecasts collected in the Greenbook, it seems natural to interpret the Greenbook inflation forecast as the consensus benchmark. Hence, in a second alternative specification, whose results are presented in table (4), we replace the committee's mean inflation forecast by the staff's Greenbook forecast, i.e. we take $E_t^i \pi_{t+h} - E_t^{staff} \pi_{t+h}$ as the dependent variable. The results are similar to the specifications presented before. In two-thirds of the estimated forecast equations we find $\beta_3 > 0$.

Taken together, the results are consistent with nonvoting members behaving strategically when submitting the inflation forecast in order to affect policy deliberation and communication. These findings also lend support to the hypothesis of McCracken

[10] This data set is available unter `http://research.stlouisfed.org/publications/review/past/2005/`.

[11] An alternative to using the preferences for interest rate adjustment would be to employ preferences for the bias announcement issued after each meeting. However, as Meade (2005) argues, this is very difficult to code from the transcripts. Often members do not discuss the bias in their statements at all.

(2010), who argues that controlling the range of forecasts for outliers improves forecast accuracy due to non-sincere forecasting behavior.

5 Conclusions

This paper used inflation forecasts from individual FOMC members to test whether forecasts vary systematically with a member's voting status. Is was shown that non-voting members formulate the inflation forecast in line with their policy preferences, i.e. they forecast higher inflation if they have a preference for policy tightening. Forecasts from voting members, in contrast, show no systematic relationship with policy preferences. Non-voters tend to submit more extreme forecasts in order to influence policy decision and communication. Hence, we provide evidence on strategic forecasting of FOMC members.

This finding is relevant not only for assessing the forecasting performance of policymakers, but also for the broader issue of the design of monetary policy committees. The ECB, for example, recently released information about the implementation of the rotation scheme for voting rights in the Governing Council.[12] With the enlargement of the Euro area in the future the size of the committee would, under the present scheme, become too large to ensure timely and efficient decisions. Therefore, a fairly complex rotation scheme will be introduced. With only one month, however, the rotation period, will be very short compared to the Federal Reserve. The results presented in this paper suggest that a rotation scheme will give rise to strategic behavior of policymakers.

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Table 1: Forecast deviations of voting and non-voting FOMC members

forecasters	horizon	estimates		# obs.
		β_0	β_1	
all	$h=1$	0.150 (0.012***)	−0.009 (0.021)	104
	$h=3$	0.160 (0.021***)	0.049 (0.039)	101
	$h=5$	0.265 (0.030***)	−0.002 (0.058)	104
Fed presidents	$h=1$	0.140 (0.017***)	0.001 (0.025)	72
	$h=3$	0.143 (0.030***)	0.067 (0.045)	72
	$h=5$	0.289 (0.049***)	−0.026 (0.070)	72
Fed presidents excl. NY Fed	$h=1$	0.157 (0.019***)	−0.016 (0.026)	66
	$h=3$	0.155 (0.036***)	0.055 (0.049)	66
	$h=5$	0.318 (0.058***)	−0.056 (0.077)	66

Notes: The dependent variable is $\left|E_t^i \pi_{t+h} - E_t^{mean} \pi_{t+h}\right|$. Results from pooled least-squares estimation. Robust standard errors in parenthesis. A significance level of 1%, 5%, and 10% is indicated by ***, **, and *.

Table 2: Deviations from mean forecast and policy preferences of voting and non-voting FOMC members

forecasters	horizon	estimates				# obs.
		β_0	β_1	β_2	β_3	
all	$h=1$	−0.026 (0.025)	0.029 (0.040)	−0.052 (0.057)	0.168 (0.078**)	100
	$h=3$	−0.050 (0.030*)	0.121 (0.054**)	−0.084 (0.059)	0.308 (0.114***)	97
	$h=5$	−0.011 (0.052)	−0.108 (0.068)	−0.092 (0.119)	0.364 (0.183**)	100
Fed presidents	$h=1$	0.032 (0.031)	−0.029 (0.044)	−0.144 (0.073*)	0.260 (0.092***)	71
	$h=3$	0.001 (0.042)	0.070 (0.061)	−0.008 (0.061)	0.233 (0.116**)	69
	$h=5$	0.128 (0.077*)	−0.247 (0.089***)	−0.228 (0.175)	0.500 (0.224**)	71
Fed presidents excl. NY Fed	$h=1$	0.049 (0.038)	−0.046 (0.049)	−0.166 (0.085*)	0.283 (0.101***)	65
	$h=3$	−0.000 (0.050)	0.071 (0.068)	−0.011 (0.070)	0.235 (0.121*)	63
	$h=5$	0.121 (0.097)	−0.240 (0.106**)	−0.225 (0.204)	0.272 (0.140*)	65

Notes: The dependent variable is $E_t^i \pi_{t+h} - E_t^{mean} \pi_{t+h}$. Results from pooled least-squares estimation. Robust standard errors in parenthesis. A significance level of 1%, 5%, and 10% is indicated by ***, **, and *.

Table 3: Deviations from median forecast and policy preferences of voting and non-voting FOMC members

forecasters	horizon	estimates				# obs.
		β_0	β_1	β_2	β_3	
all	$h=1$	−0.026 (0.024)	0.028 (0.037)	−0.050 (0.054)	0.159 (0.074**)	100
	$h=3$	−0.033 (0.029)	0.119 (0.051**)	−0.106 (0.055*)	0.313 (0.106***)	97
	$h=5$	−0.011 (0.049)	−0.103 (0.064)	−0.088 (0.112)	0.344 (0.172**)	100
Fed presidents	$h=1$	0.029 (0.029)	−0.027 (0.041)	−0.137 (0.069*)	0.245 (0.086***)	71
	$h=3$	0.018 (0.041)	0.068 (0.059)	−0.028 (0.055)	0.235 (0.106**)	69
	$h=5$	0.120 (0.072*)	−0.234 (0.084***)	−0.215 (0.165)	0.472 (0.211**)	71
Fed presidents excl. NY Fed	$h=1$	0.045 (0.036)	−0.043 (0.046)	−0.157 (0.080*)	0.266 (0.095***)	65
	$h=3$	0.017 (0.050)	0.069 (0.066)	−0.028 (0.063)	0.235 (0.111**)	63
	$h=5$	0.113 (0.091)	−0.228 (0.100**)	−0.212 (0.192)	0.469 (0.233**)	65

Notes: The dependent variable is $E_t^i \pi_{t+h} - E_t^{median} \pi_{t+h}$. Results from pooled least-squares estimation. Robust standard errors in parenthesis. A significance level of 1%, 5%, and 10% is indicated by ***, **, and *.

Table 4: Deviations from Greenbook forecasts and policy preferences of voting and non-voting FOMC members

forecasters	horizon	estimates				# obs.
		β_0	β_1	β_2	β_3	
all	$h=1$	−0.053 (0.037)	0.033 (0.074)	−0.071 (0.066)	0.165 (0.107)	100
	$h=3$	−0.062 (0.056)	0.093 (0.076)	0.021 (0.106)	0.391 (0.144***)	97
	$h=5$	0.020 (0.055)	−0.081 (0.073)	−0.120 (0.120)	0.301 (0.179*)	100
Fed presidents	$h=1$	0.004 (0.048)	−0.023 (0.081)	−0.129 (0.090)	0.223 (0.124*)	71
	$h=3$	0.012 (0.076)	0.018 (0.092)	0.198 (0.120)	0.214 (0.155)	69
	$h=5$	0.152 (0.082)	−0.213 (0.095**)	−0.265 (0.170)	0.445 (0.218**)	71
Fed presidents excl. NY Fed	$h=1$	0.013 (0.058)	−0.033 (0.087)	−0.128 (0.104)	0.222 (0.135*)	65
	$h=3$	0.010 (0.090)	0.020 (0.104)	0.186 (0.134)	0.226 (0.166)	63
	$h=5$	0.147 (0.101)	−0.208 (0.112*)	−0.261 (0.199)	0.442 (0.240*)	65

Notes: The dependent variable is $E_t^i \pi_{t+h} - E_t^{staff} \pi_{t+h}$. Results from pooled least-squares estimation. Robust standard errors in parenthesis. A significance level of 1%, 5%, and 10% is indicated by ***, **, and *.