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Do FOMC Members Herd?

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Abstract

Twice a year FOMC members submit forecasts for growth, unemplyoment and inflation to be published in the Humphrey-Hawkins Report to Congress. In this paper we use individual FOMC forecasts to assess whether these forecasts exhibit herding behavior, a pattern often found in private sector forecasts. While growth and unemployment forecast do not show herding behavior, the inflation forecasts show strong evidence of anti-herding, i.e. FOMC members intentionally scatter their forecasts around the consensus. Interestingly, anti-herding is more important for non-voting members than for voters.

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1 Introduction

Members of the Federal Open Market Committee (FOMC) of the Federal Reserve not only set interest rates, but twice a year also submit forecasts of core macroeconomic variables such as growth, unemployment and inflation. The range of these individual forecasts is eventually published in the semi-annual Humphrey-Hawkins Report to Congress. While a vast amount of research is devoted to the interest rate setting behavior of FOMC members, much less is known about their forecasting behavior. This is a severe shortcoming of the literature since the FOMC's own forecasts are, besides those of the Federal Reserve staff collected in the Greenbook, an important input for monetary policy decisions and a key factor in the Fed's communication with the public. For example, Orphanides and Wieland (2008) show that the FOMC's own projections are more important for explaining interest rate decisions within a Taylor-rule framework than observed macroeconomic outcomes. Until recently, however, an analysis of FOMC forecasting was hampered by the non-availability of individual forecast data. Fortunately, a new data set presented by Romer (2010) makes these forecasts available for the period 1992-1998.

This paper is one of the first attempts to study the forecasting behavior of FOMC members. We evaluate the extent of herding behavior of FOMC forecasts, a pattern often found in private sector forecasts (Pierdzioch et al., 2010). We use a simple, yet powerful, statistical framework to study whether an individual forecaster is affected by forecasts submitted by fellow FOMC members. The FOMC forecasts are submitted simultaneously, but members could revise their forecast after the meeting. If forecasts show an intentional bias towards the consensus forecast, we refer to this outcome as herding behavior. If, instead, forecasters systematically deviate from the consensus forecast, their behavior is characterized as anti-herding. In this case members submit exaggerated forecasts relative to the consensus.

Our results are threefold. First, FOMC members exhibit a strong degree of anti-herding when submitting inflation forecasts. Their forecasts of real variables, however, show no signs of herding. Second, anti-herding is more relevant for non-voting members. Third, we find interesting patterns of herding and anti-herding with respect to private sector forecasts. These findings corroborate the notion of strategic behavior of FOMC members recently put forward by McCracken (2010) and others. FOMC members appear to use their forecast to signal their policy preferences and to give the debate on the FOMC additional spin.

2   The Data Set

Twice a year at its February and July meetings the FOMC publishes the monetary policy report to Congress (Humphrey-Hawkins report). For this report, each FOMC member submits her own set of macroeconomic forecasts. 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.[1]

Recently, the Fed makes data on individual FOMC forecasts available for selected years. Based on these releases, Romer (2010) constructs a data set containing forecasts for the period 1992-1998. The data set contains growth, inflation and unemployment 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 three quarters ahead. The inflation forecast is the expected fourth-quarter-to-fourth-quarter change of the Consumer Price Index, while the unemployment and growth forecasts refer to the outcome in the fourth quarter of the year. All forecasts are supposed to be conditional on each member's own judgement of the "appropriate policy" path over the forecast horizon. For each of the three different forecasts per year, the data set contains forecasts for inflation for seven years and 18 FOMC members.

We supplement the data set with forecasts from the private sector, which are drawn from the Consensus Economic Forecast poll. During the first week of each month this survey asks professional forecasters about their projection of the same variables as the FOMC with the same forecast horizon.

In order to examine the time-series dimension and the cross-sectional dimension of the our data, Figures 1 to 3 plot the time series of (i) the FOMC forecasts (dots), (ii) the actual realized values (solid line), and (iii) the consensus forecast of the private sector (rectangles). The vertical distance between the forecasts and the line can be interpreted as the forecast error. Not surprisingly, the FOMC forecasts move in tandem with the private sector consensus forecast. Another important information is that the cross-sectional heterogeneity of FOMC forecasts is substantial. For instance in February 1994 the growth (inflation) forecasts vary across the FOMC between 2.5 (2.25) and 3.8 (4) percent. Given this heterogeneity, the following sections study in more detail individual FOMC forecasts and the

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[1] These data received some attention in recent years (Gavin, 2003). Gavin and Mandal (2003) compare forecast accuracy between the FOMC, the private sector, and the staff. Gavin and Pande (2008) use data from the survey of professional forecasters to mimic the FOMC's forecasting method and analyze different measures of forecast consensus.

degree of herding behavior.[2]

<center>Insert Figure 1 to 3 about here.</center>

3   Testing for (Anti-)Herding

To uncover herding behavior of FOMC members, we use a test proposed by Bernhardt et al. (2006).[3] Their test is easy to implement, and the economic interpretation of the results is straightforward. In order to illustrate how the test works, it is useful to consider a forecaster who forms an *"efficient"* private forecast. The forecaster derives her private forecast by applying her *"optimal"* forecasting model using all information available. Her private forecast, thus, will be unbiased and the probability that her private forecast eventually overshoots or undershoots the future realized value should be 0.5. The forecast submitted to her principal, in our case the FOMC, however, may differ from her private forecast. One reason for a potential wedge between the private forecast and the published forecast is that the latter is influenced by the *"consensus"* forecast which is defined as the arithmetic mean among all other FOMC members.[4] In the case of herding behavior of a forecaster, her published forecast $\tilde{s}_{t,t+h}$ at time t for the period $t + h$ ($h = 1$, 3 and 5 quarters) will be biased towards the consensus forecast $\bar{s}_{t,t+h}$. In case the private forecast exceeds (falls short of) the consensus forecast, the published forecast will be smaller (larger) than the private forecast, implying that the probability of undershooting (overshooting) the realized value s_{t+h} is smaller than 0.5, i.e.

$$P\big(s_{t+h} < \tilde{s}_{t,t+h} \,\big|\, \tilde{s}_{t,t+h} > \bar{s}_{t,t+h}, s_{t+h} \neq \tilde{s}_{t,t+h}\big) < 0.5 \tag{1}$$

and

$$P\big(s_{t+h} > \tilde{s}_{t,t+h} \,\big|\, \tilde{s}_{t,t+h} < \bar{s}_{t,t+h}, s_{t+h} \neq \tilde{s}_{t,t+h}\big) < 0.5. \tag{2}$$

In contrast, if a forecaster anti-herds, her published forecast will be further away from the consensus forecast than her private forecast. The result is

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[2]See Banternghansa and McCracken (2009) for a recent study on forecast disagreement of FOMC members based on the Romer (2010) data set.

[3]The herding behavior of forecasters participating in the Consensus poll is subject of a large literature. Using the same test, Pierdzioch et al. (2010) show that forecasters in the housing market anti-herd.

[4]Hence, the consensus available to the FOMC member does not include his own forecast. Results based on the median forecast, thus controlling for outliers, are qualitatively similar and available upon request.

that the probabilities of either undershooting or overshooting will be larger than 0.5, i.e.

$$P(s_{t+h} < \tilde{s}_{t,t+h} \,|\, \tilde{s}_{t,t+h} > \bar{s}_{t,t+h}, s_{t+h} \neq \tilde{s}_{t,t+h}) > 0.5 \tag{3}$$

and

$$P(s_{t+h} > \tilde{s}_{t,t+h} \,|\, \tilde{s}_{t,t+h} < \bar{s}_{t,t+h}, s_{t+h} \neq \tilde{s}_{t,t+h}) > 0.5. \tag{4}$$

The test statistic, S, is defined as the average of the sample estimates of the conditional probabilities. The null hypothesis of the test is that the published forecasts are unbiased. Unbiased forecasts imply $S = 0.5$, herding implies $S < 0.5$, and anti-herding implies $S > 0.5$. Bernhardt et al. (2006) show that the test statistic, S, asymptotically has a normal sampling distribution. They also demonstrate that the test is robust with respect to correlated forecast errors, market-wide shocks, and collective optimism or pessimism among forecasters.

Tables 1 to 4 report the results of the herding tests using the individual forecasts of the FOMC with alternative measures of the consensus forecast. Table 1 uses the consensus among all FOMC members. It turns out that the FOMC does not (anti-)herd when forecasting the growth rate and the unemployment rate. The inflation forecasts, however, exhibit clear signs of anti-herding with the S-statistic significantly exceeding the value of 0.5. Apparently, members intentionally scatter their projections away from the consensus.

As mentioned before, the voting right rotates across of the regional Federal Reserve Bank presidents, while the Federal Reserve Governors are always allowed to vote.[5] Table 2 uses all forecast horizons ($h = 1, 3$ and 5) but disentangles the forecasting behavior of these two groups. The results reveal that the anti-herding characterizing inflation forecasts stems from the behavior of non-voters. Voters, in contrast, submit unbiased forecasts. This is consistent with the results presented by Tillmann (2010), who finds that hawkish non-voters overpredict inflation while dovish non-voters systematically underpredict inflation. In a similar vein, McCracken (2010) argues that hawkish members have an incentive to forecast high inflation in order to support the need for tighter monetary policy. He finds that

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[5]The President of the New York Fed does not participate in the rotation scheme. From the remaining 11 regional Federal Reserve Banks, four Presidents are entitled to vote at each point in time.

for inflation, the outlier-adjusted forecast range is more accurate than the midpoint of the full range. Put differently, controlling for outliers improves the accuracy of the FOMC's inflation forecast.

Table 3 supports this finding by replacing the FOMC consensus by the consensus among the voting members. Again, the non-voters systematically differentiate their inflation forecasts from those of voters. As a robustness check, we replace the consensus among FOMC members by the consensus of private sector forecasters taken from the Consensus Forecast poll which is released one week before the FOMC meeting. These findings are reported in Table 4. Again, the FOMC members anti-herd when forecasting the inflation rate, but show no signs of herding behavior for the forecasts of real variables.

Insert Tables 1 to 4 about here.

4 Conclusions

In this paper, we analyze the forecast behavior of FOMC members using a novel data set. While growth and unemployment forecast do not show (anti-)herding behavior, the inflation forecasts show strong evidence of anti-herding, i.e. FOMC members intentionally scatter their forecasts around the consensus. This result holds when either the FOMC's mean forecast or private sector forecasts are used to represent the consensus view. Moreover, anti-herding is more relevant for non-voting members than for voters.

These findings are consistent with members following strategic motives when submitting inflation forecasts. In this sense FOMC members behave like private sector forecasters. A crucial difference, however, is that FOMC members not only submit forecasts, but also set monetary policy in a way consistent with these forecasts. The consequences of strategic forecasting for interest rate setting are an interesting topic for future research once sufficient forecast data is made available to facilitate a rigorous empirical investigation.

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Table 1: (Anti-)Herding within the FOMC

Variable	Growth			Inflation			Unemployment		
Horizon	$h=1$	$h=3$	$h=5$	$h=1$	$h=3$	$h=5$	$h=1$	$h=3$	$h=5$
S-statistic	0.53	0.53	0.53	0.61	0.65	0.65	0.63	0.54	0.50
Stand. Dev.	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lower 90 %	0.45	0.45	0.45	0.53	0.58	0.57	0.54	0.46	0.42
Upper 90 %	0.60	0.60	0.60	0.69	0.73	0.73	0.71	0.62	0.58
Observations	120	120	120	108	110	114	105	116	118

Table 2: (Anti-)Herding of Voters and Non-Voters

Variable	Growth		Inflation		Unemployment	
Status	Voter	Non-voter	Voter	Non-voter	Voter	Non-voter
S-statistic	0.53	0.52	0.57	0.64	0.55	0.56
Stand. Dev.	0.05	0.03	0.05	0.03	0.05	0.03
Lower 90 %	0.46	0.47	0.49	0.59	0.47	0.50
Upper 90 %	0.61	0.57	0.65	0.70	0.62	0.62
Observations	125	236	114	214	118	221

Table 3: (Anti-)Herding of Non-Voters with Respect to Voters

Variable	Growth			Inflation			Unemployment		
Horizon	$h=1$	$h=3$	$h=5$	$h=1$	$h=3$	$h=5$	$h=1$	$h=3$	$h=5$
S-statistic	0.48	0.59	0.55	0.64	0.61	0.64	0.60	0.66	0.50
Stand. Dev.	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Lower 90 %	0.39	0.49	0.46	0.53	0.52	0.55	0.50	0.56	0.40
Upper 90 %	0.58	0.68	0.65	0.74	0.71	0.74	0.71	0.76	0.60
Observations	73	80	78	62	77	75	66	76	72

Table 4: (Anti-)Herding of the FOMC from the Consensus Economics Poll

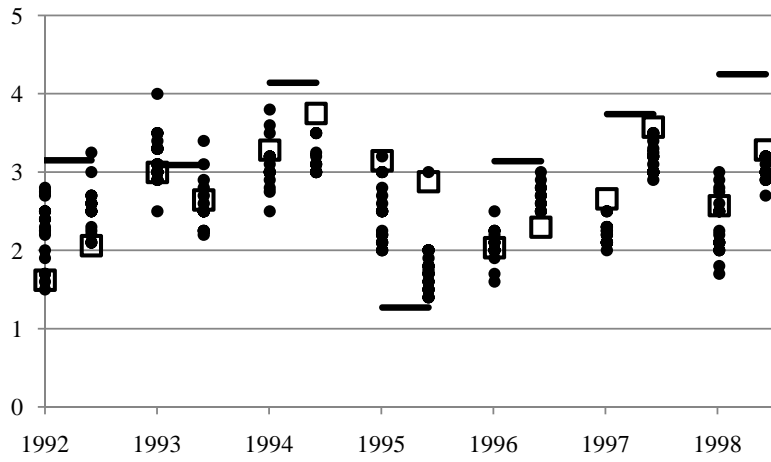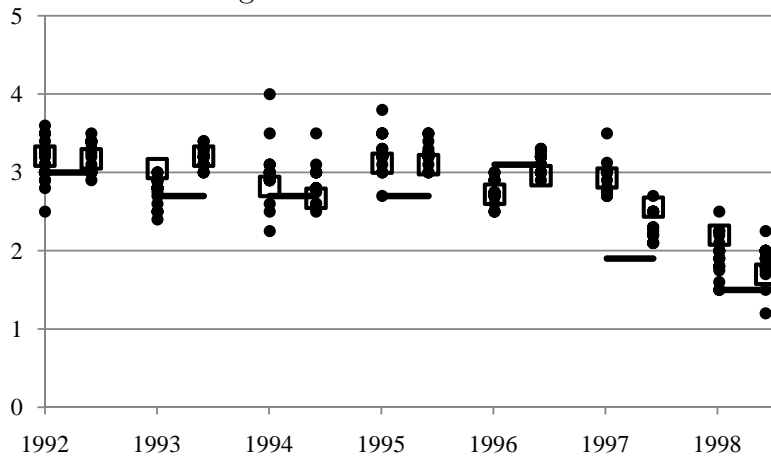| Variable	Growth			Inflation			Unemployment		
Horizon	$h=1$	$h=3$	$h=5$	$h=1$	$h=3$	$h=5$	$h=1$	$h=3$	$h=5$
S-statistic	0.45	0.51	0.43	0.62	0.60	0.62	0.59	0.52	0.50
Stand. Dev.	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lower 90 %	0.37	0.43	0.35	0.54	0.52	0.54	0.51	0.44	0.42
Upper 90 %	0.52	0.59	0.50	0.70	0.68	0.70	0.68	0.60	0.58
Observations	120	120	120	116	111	117	105	116	118

Figure 1: Growth Forecasts
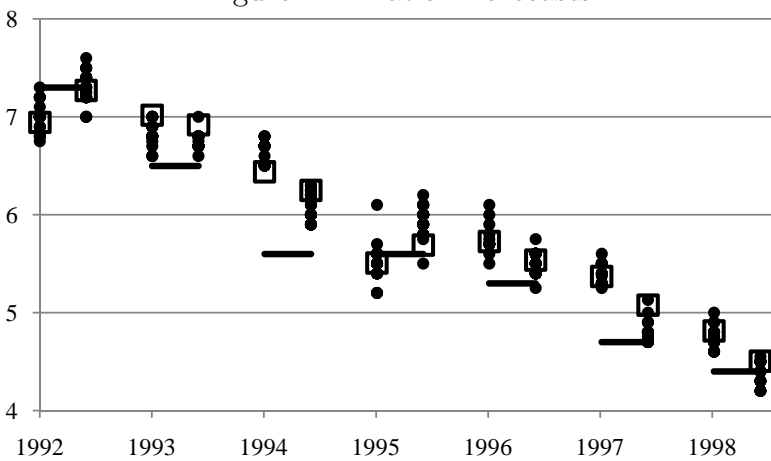

Figure 2: Inflation Forecasts

Figure 3: Unemployment Forecasts

•FOMC; □ private sector consensus; — realized value