

Learning and Bandwagons in Monetary Policy Committees

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Project History

With my co-authors, I have studied a number of aspects of committee decision-making on monetary policy choices.

MPCs meet regularly, repeatedly address the same issue, and some report considerable data on deliberations, votes, and outcomes.

I have often been asked if records permit one to identify the order of speaking in a meeting. For the U.S. Federal Reserve's FOMC, the answer is yes.

Motivation

Do committees make better decisions than individuals? If so, how?

Deliberation may produce learning as a committee meeting proceeds and better decisions

Bandwagons that are not strictly related to learning may also occur.

Modeling Learning and Bandwagons

We propose a model of Bayesian learning in which bandwagons can arise as members sequentially reveal their desired interest rate targets in a meeting.

As an alternative, we investigate bandwagons in which members defer to an emerging consensus.

We find no evidence of bandwagons of either variety.

Data

Includes individuals' stated desired interest rates and the order of speaking for the Arthur Burns era, 1970-1978.

Desired interest rates are coded for 80% of member-meeting observations.

Data are derived from *Memoranda of Discussion* and *FOMC Transcripts*.

Bayesian Bandwagons: Individual's Desired Rates

$$R_{it}^* = \bar{R}_{it} + u_{it} . \quad (1)$$

In this equation, \bar{R}_{it} indicates the “normal” interest rate that speaker i would favor in meeting t , given prevailing observed macroeconomic conditions, while u_{it} is a discretionary deviation from \bar{R}_{it} that reflects non-public information available to speaker i .

How is u_{it} determined?

Notation/Information

- ε_t In each period, there is an “optimal deviation” from the normal rate for prevailing circumstances. This deviation is not observed.
- τ^2 ε_t is drawn from a normal distribution with mean zero and variance τ^2 (both known).
- e_{it} Each speaker in the meeting receives a signal e_{it} .
- σ^2 The distribution of the signal e_{it} is normal with known variance σ^2 and a mean of ε_t

The Problem for Speaker 1

Speaker 1 observes e_{1t} .

He will determine a desired interest rate, $R_{1t}^* = \bar{R}_{1t} + u_{1t}$.

$u_{1t} = E(\varepsilon_t | e_{1t})$ is the solution to a Bayesian updating problem:

$$u_{1t} = E(\varepsilon_t | e_{1t}) = \frac{\tau^2}{\sigma^2 + \tau^2} e_{1t}.$$

The Problem for Speaker 2

Speaker 2 knows that Speaker 1 favors interest rate R_{1t}^* .

Assuming that speaker 2 also knows \bar{R}_{1t} then speaker 2 can infer $u_{1t} = R_{1t}^* - \bar{R}_{1t}$.

Then speaker 2 can use equation (2) to infer what signal, e_{1t} , must have been received by speaker 1.

Speaker 2 also receives an independent signal, e_{2t} .

The Solution for Speaker 2

Member 2 will advocate $R_{2t}^* = \bar{R}_{2t} + u_{2t}$.

Based on her knowledge of the two signals, she will set $u_{2t} = E(\varepsilon_t | e_{1t}, e_{2t})$.

The solution to the Bayesian updating problem is:

$$u_{2t} = E(\varepsilon_t | e_{1t}, e_{2t}) = \frac{\tau^2}{\sigma^2 / 2 + \tau^2} \left(\frac{e_{1t} + e_{2t}}{2} \right).$$

Remaining Speakers

By similar reasoning, the i^{th} speaker in a meeting can infer signals of all preceding speakers and will determine a

desired interest rate, $R_{it}^* = \bar{R}_{it} + u_{it}$, such that

$$u_{it} = E(\varepsilon_t | e_{1t}, e_{2t}, \dots, e_{it}) = \frac{\tau^2}{\sigma^2 / i + \tau^2} \left(\frac{e_{1t} + e_{2t} + \dots + e_{it}}{i} \right).$$

Error Covariances

For each pair of speakers in a meeting, we calculate:

$$c_{ij} = \text{Cov}(u_{it}, u_{jt}) = \frac{1}{\max(i, j)} \left(\frac{\tau^2}{\sigma^2 / i + \tau^2} \right) \left(\frac{\tau^2}{\sigma^2 / j + \tau^2} \right) \sigma^2$$

Econometric Specification

$$R_{it}^* = \bar{R}_{it} + u_{it} \quad (1)$$

$$\bar{R}_{it} = \sum_{k=1}^K \alpha_k d_{itk} + v_t \quad (6)$$

$$R_{it}^* = \sum_{k=1}^K \alpha_k d_{itk} + v_t + u_{it} \quad (7)$$

Generalizing the Specification

Replace

$$R_{it}^* = \sum_{k=1}^K \alpha_k d_{itk} + v_t + u_{it} \quad (7)$$

with

$$R_{it}^* = \sum_{k=1}^K \alpha_k d_{kit} + v_t + u_{it} + z_{it}. \quad (10)$$

Implications

Covariances are positive.

Variances can increase or decrease with i .

Correlations are higher for pairs closer together and later in the order.

Estimation

Given a sample of desired interest rates for individual monetary policy committee members in a sequence of meetings, we can estimate equation (7).

We use MLE.

This is a linear regression model specifying that the desired interest rate for speaker i in meeting t is a function of time and member fixed effects and the error, u_{it} .

Testing for Bayesian Bandwagons

The Bayesian bandwagon hypothesis has implications for the structure of the covariance matrix of the u_{it} , as described above.

Econometric Results

When the general model is estimated $\tau^2 = 0$, which is the case of the classical linear model.

When restrictions of the Bayesian Bandwagon model are imposed, the fit is poor and the restrictions are overwhelmingly rejected.

Why is the Model Rejected?

A key implication of the Bayesian bandwagon model is that error covariances be positive. However, sample covariances from OLS residuals of equation (7) show that:

Of 171 non-diagonal elements of the sample covariance matrix, 111 entries are negative

The average covariance matrix entry is -0.0018 and an average correlation matrix entry is -0.0735 .

An Alternative Model

Bandwagons might be thought of in terms of converging policy positions rather than converging information.

A reformulation:

$$R_{it}^* = \bar{R}_{it} + u_{it} + \beta \left[\tilde{R}_{it} - (\bar{R}_{it} + u_{it}) \right], \quad 0 \leq \beta \leq 1.$$

We find $\beta < 0$, rejecting this model as well.

Conclusions

We have rejected two bandwagon models.

A possible interpretation of our results is that all useful information is fully revealed prior to the policy go-around, rather than as the policy go-around proceeds.

Deliberation at the FOMC declined in the Greenspan years. However, the absence of deliberation may not imply lower quality of decisions.