The Revision Process for Greenbook Forecasts

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Abstract

We examine the rationality of the Fed's revisions to forecasts of inflation, GDP growth, and unemployment by testing for bias and efficient incorporation of new information (news). Traditionally, autocorrelation amongst the revisions is interpreted as irrationality. However, we entertain a more charitable view – the Fed's learning process about *trends* in the economy may create the illusion of irrationality. We also hope that forecast smoothing will help to explain the empirical result of interest rate smoothing found in the Taylor rule literature. Lastly, by comparing the Fed's revisions of forecasts across horizons and data series, we hope to determine Fed perceptions of the nature (supply or demand) and persistence of specific shocks.

Data

-Previous work abstracts away from timing issues, often assuming that releases consistently occur on an arbitrary day of the month

-Inaccurate categorization of the Fed's information set at a given time, impeding efficiency tests

-Variable timing of Greenbook publications and data releases create complex timing issues

-Data about a given quarter goes through three main releases and subsequent revisions:

-**Advanced release**: release pertaining to previous quarter is (usually) released in the first month of the quarter. Least accurate and precise release. Based on incomplete survey

-**Preliminary release**: (usually) issued in second month of quarter. Revision to advanced release. More accurate and precise, based on completed survey

-**Final release:** Only issued since 1974. Revision to preliminary release. Most accurate and precise release.

-**(Bi)annual revisions:** Revisions on data from two or more quarters ago are made on an annual or biannual basis – usually in January and/or July.

-Greenbook publications and data releases occur on erratic schedules and at different frequencies

-Therefore, we use a unique "comprehensive real time data set"

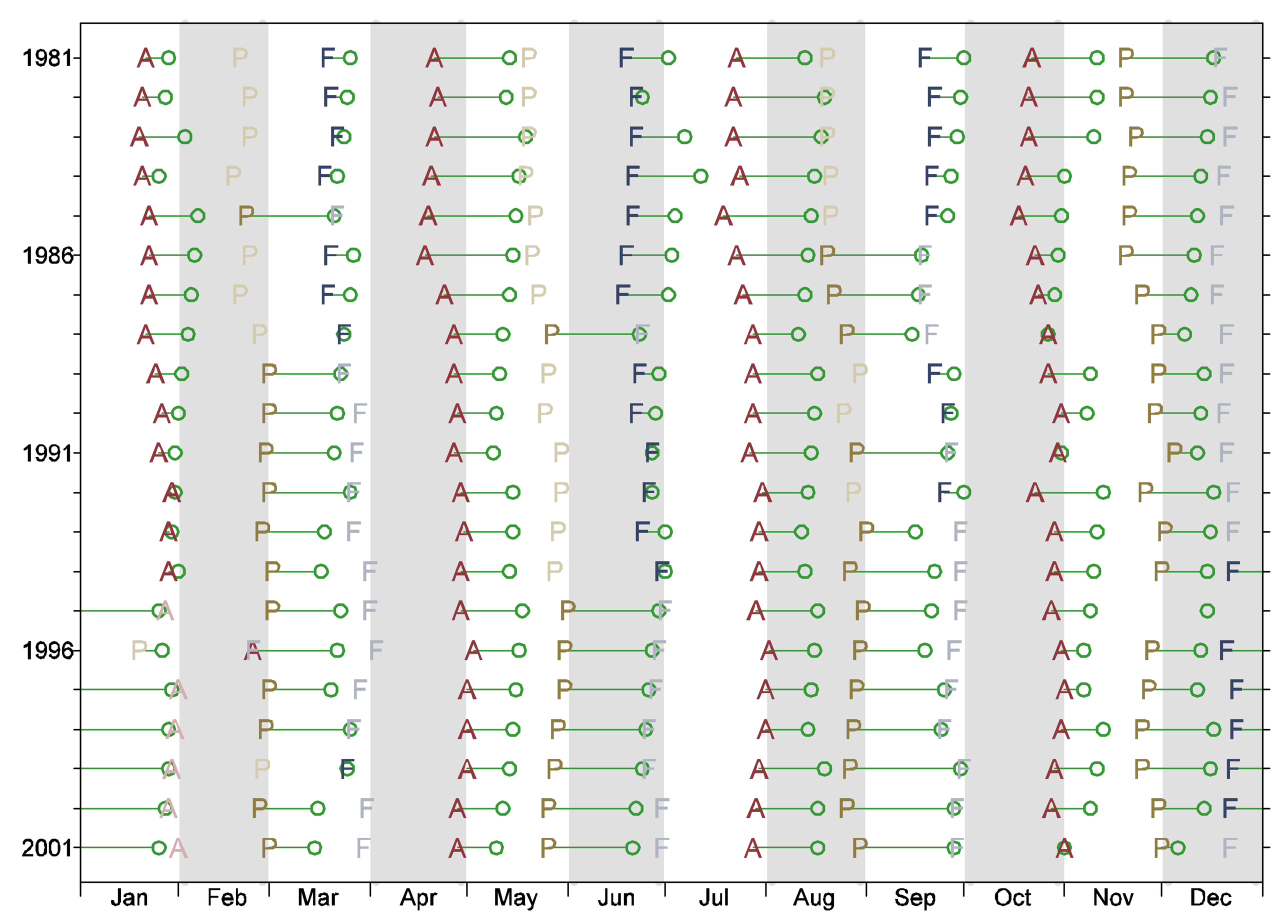
-Contains dates of Bureau of Economic Analysis (BEA) and Bureau of Labor Statistics (BLS) data releases since 1966, classified by type of release

-Allows determination of information available to the Fed when it published a Greenbook, and what "news" was released since the last Greenbook.

-News is defined as difference between information in a given release and previously known information about the quarter to which the release pertains.

-Enables precise tests of the efficiency of the Fed's use of information

Timeline of Data Releases and Greenbooks



A = Advanced release P = Preliminary release F = Final Release
Green circles = Greenbook publication dates; Lines connect Greenbooks to most recent release

Methodology

-According to traditional notions of rationality, rational forecast revisions should not be correlated with their lags. Therefore, for forecasts at the 0-7 horizons of inflation, GDP, and unemployment, we estimate equations of the type:

$$FR_{g,t} = a + \sum_{k=1}^{q} (b_k FR_{g-k,t}) + v$$

where $FR_{g,t}$ is the forecast revision made at Greenbook g to the prediction for target year t.
-We test the null hypothesis that a = 0 and ß = 0.
-If a ? 0, then the revisions are biased.
-If ß is positive, then revisions are systematically followed by further revisions in the same direction.
-Fed "irrationally" under-reacts to new information in revisions and then must correct for this under-reaction in future revisions i.e. forecast smoothing
-Some game theoretic accounts justify this behavior on the part of the forecaster.
-Based on previous literature, we expect to find this behavior
-If ß is negative, then revisions are systematically followed by further revisions in the opposite direction.
-Fed under-reacts to new information and must correct with future revisions in opposite direction

-A second rationality test examines whether revisions are correlated with information that was known at the time of the previous revision (i.e. lagged news). Therefore, in a second estimation, we regress the revisions on lagged news.
-Must distinguish between news equal to zero (i.e. a release that merely confirms the Fed's previous information about data in a given quarter) from no news (i.e. when no releases pertaining to a given quarter have been issued since the last Greenbook).
-May also attempt to distinguish between types of releases (i.e. advanced, preliminary or final)

-Lastly, we will regress forecast errors (notably, *ex post* data available to the econometrician but not to the forecaster) on the forecast revisions

-By splitting the regressions based on the sign of the revision, we can test behavioral assumptions about the forecasters as well as once again testing the rationality of the revisions.

-Optimism v. Pessimism

-Overreaction v. Underreaction

Preliminary Results

-Less evidence of correlation with lagged revisions than expected

-Often finding *negative* correlation with recent lags

-Implies overreaction and correction instead of smoothing

-Means that forecast smoothing is most likely *not* an explanation for interest rate smoothing

-Similar qualitative results when contemporaneous news is included in the regression to add precision to estimates of standard errors

-Some evidence of correlation with lagged news

-Signs vary, implying that the Fed sometimes systematically *over*reacts to news and sometimes systematically *under*reacts to news depending on the series being forecasted and the forecast horizon

Extensions

-Investigating ways to pool the data across horizons to take full advantage of three dimensional panel data set

-Idiosyncratic timing and overlapping shocks create extraordinarily complicated covariance matrix

-Multivariate regressions

-e.g. Are Fed forecasts of inflation correlated with lagged news about GDP growth?

-Waiting for data confirmation

-Possible that the Fed waits for news to be confirmed before deciding whether the news is transitory or persistent. May need a measure of "cummulative news" across Greenbooks to pick up this phenomenon

-Regressing revisions on lagged news may not pick up this behavior unless Fed always waits the same number of quarters for confirmation (unrealistic)