Discussion of
"How Useful are Estimated DSGE Model Forecasts for Central Bankers"
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Methodology -- 1

- Bayesian approach to estimation

$$p(\theta \mid y_t, S) = \frac{L(y_t \mid \theta, S) p(\theta \mid S)}{p(y \mid S)}$$

- But, frequentist (?) approach to prediction

$$m(\theta^*, S) = \int y_{t+j} f(y_{t+j} \mid y_t, \theta^*, S) dy_{t+j}$$

$$\text{where} \quad \theta^* = \max p(\theta \mid y_t, S)$$

- Bayesian would never ignore uncertainty for y_{t+j} and especially for ϑ. Rather:

$$h(y_{t+j} \mid y_t, S) = \int p(y_{t+j} \mid y_t, \theta^*, S) p(\theta \mid y_t, S) d\theta$$

Methodology -- 2

- What does their artificial CB staff knows?

$$p(\theta|y_t,S) = \frac{L(y_t|\theta,S)\,p(\theta|S)}{p(y|S)}$$

1. But, in the case of Smets and Wouters frontier between ϑ and S is rather tenuous.

2. And this staff member forgets what he/she just learns every period.

Methodology -- 3

- Focus on quarterly inflation (GDP growth) in 8 quarters.

- But, swamped by uncertainty from:
  - Data collection
  - Seasonal adjustments

- What does Jason Furman care about: annual GDP growth (cumulative). Harder to judge econometrically, but still the object of interest.

How bad are these forecasts?

Figure 2. Realized and 4Q Ahead DSGE Model Forecasts
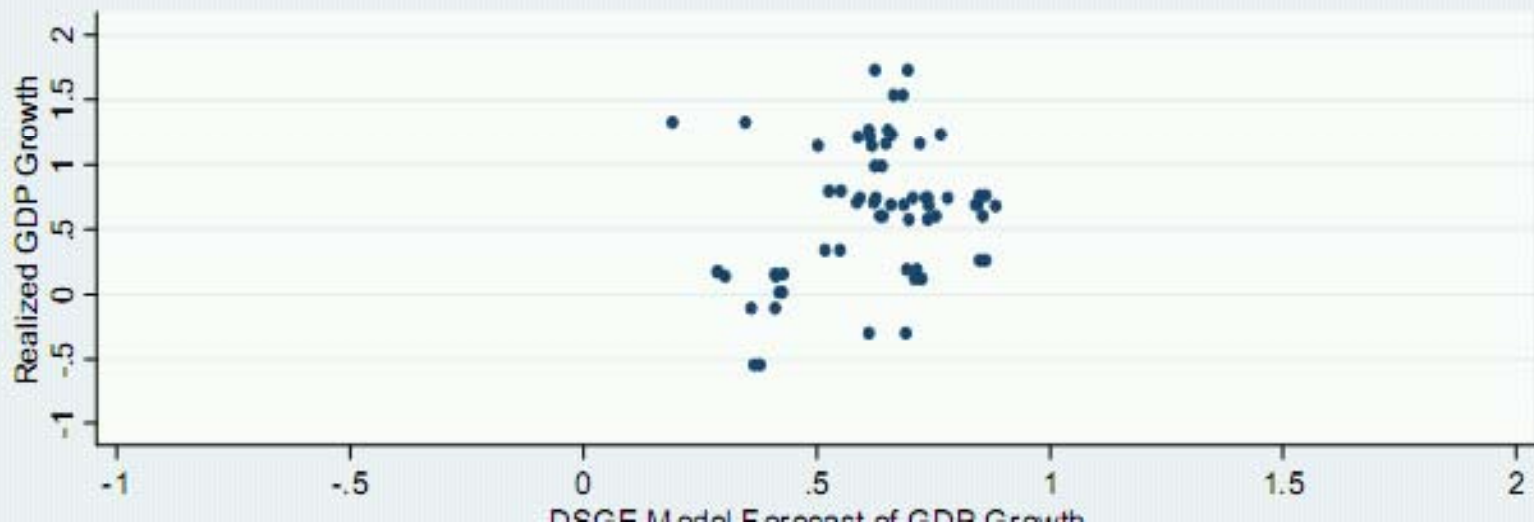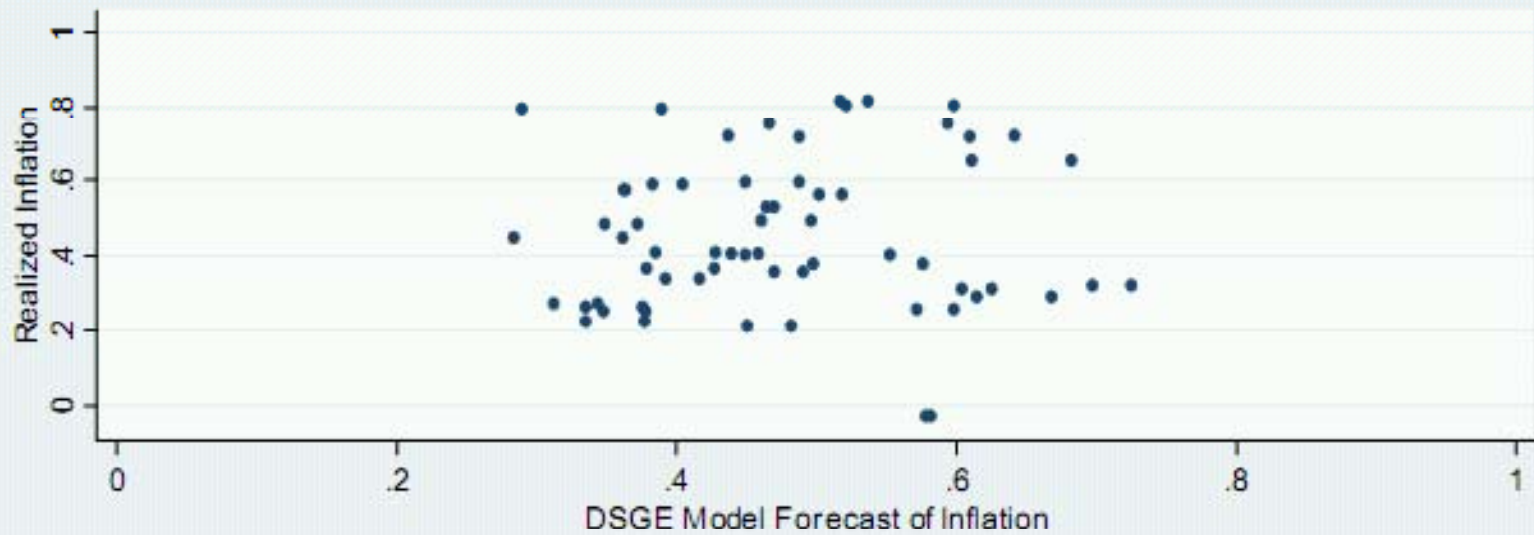
How bad are these forecasts?

- Upper bound: BEA revisions.
  - Output 97Q3 – 04Q4:   RMSE = 0.005, R^2 =0.53
  - Output 97Q3 – 10Q1:   RMSE = 0.005, R^2 =0.56
  - Inflation 97Q3 – 04Q4:   RMSE = 0.001, R^2 =0.52
  - Inflation 97Q3 – 04Q4:   RMSE = 0.002, R^2 =0.58

- Lower bound: random walk
  - Output 97Q3 – 04Q4:   RMSE = 0.156, R^2 = 0.05
  - Output 97Q3 – 04Q4:   RMSE = 0.168, R^2 = 0.03
  - Inflation 97Q3 – 04Q4:   RMSE = 0.139, R^2 = 0.19
  - Inflation 97Q3 – 04Q4:   RMSE = 0.158, R^2 = 0.17

- Smets-Wouters 1-period ahead
  - Output: RMSE = 0.5, R^2 = 0.16
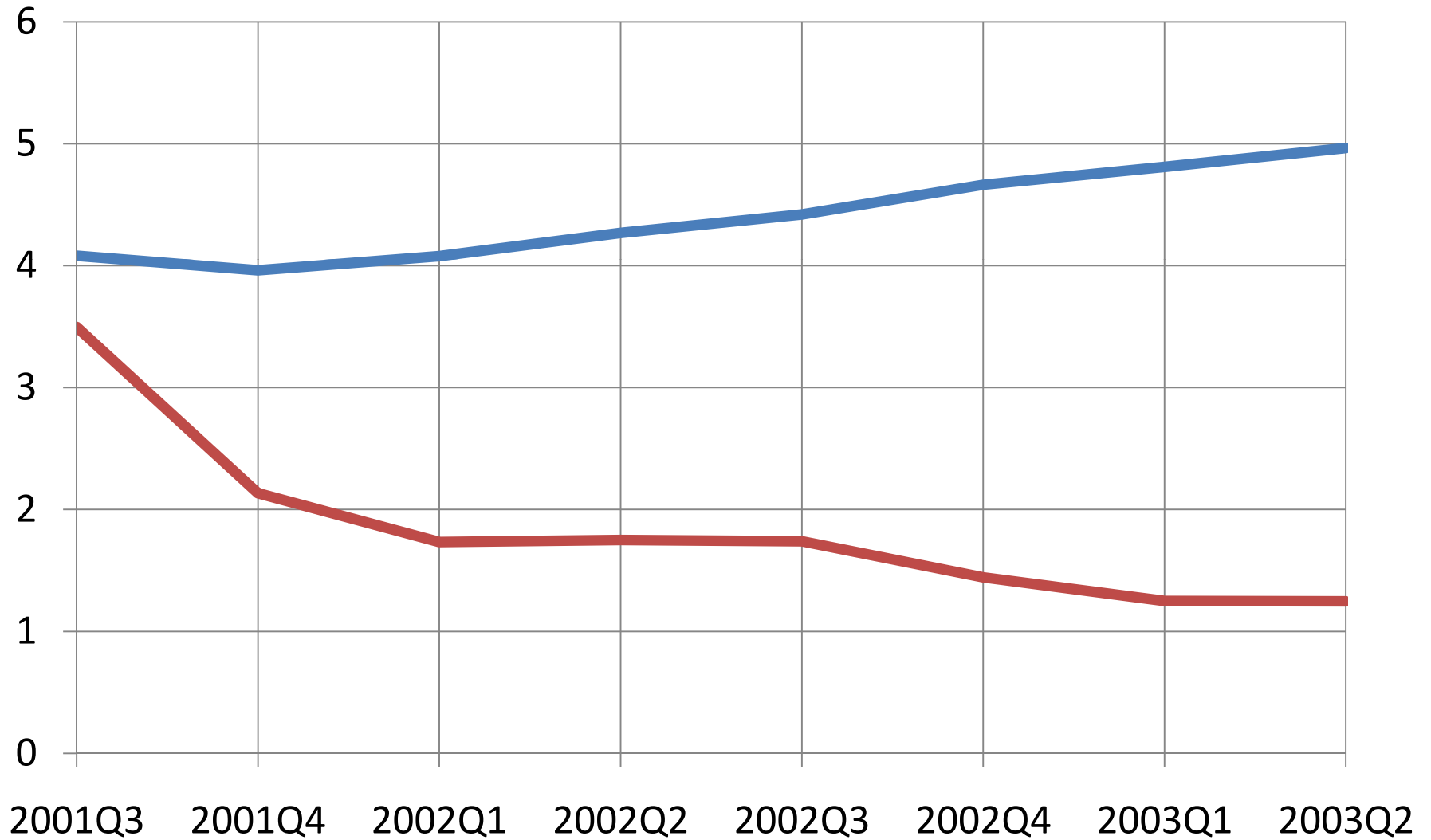 - Inflation: RMSE = 0.12, R^2 = 0.09

But are DSGEs for forecasting?

- For *prediction*, what would happen if policymaker took one of the options available.

- Example: Challenge at the start of 2001Q3.

- Policymaker has the RR estimated DSGE model

- Gets hit by a shock that economists did not (should not) predict: 9/11
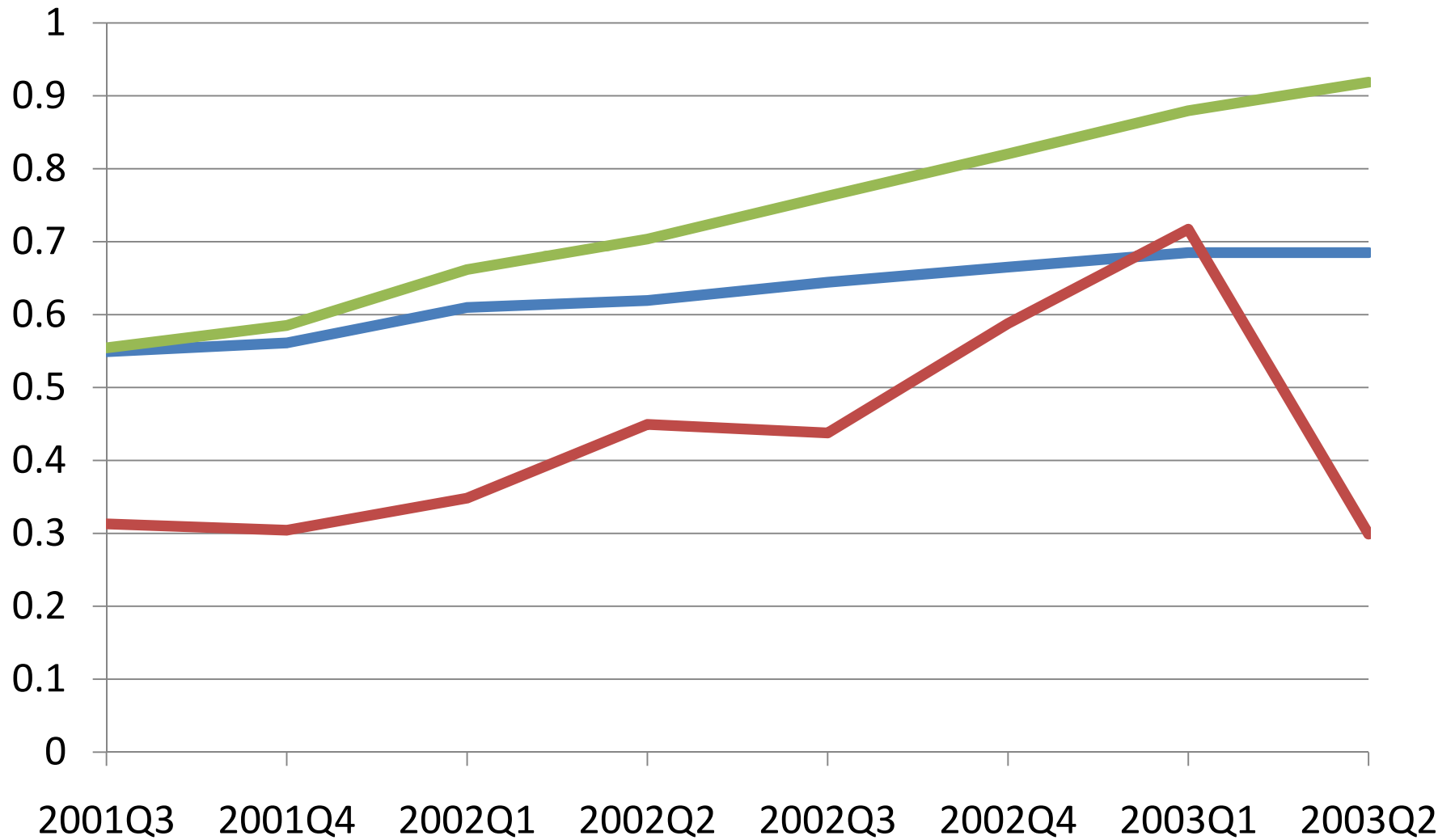
Federal funds rate

Inflation

2001Q2 forecast — Reality — Counterfactual

Real GDP growth

Legend: 2001Q2 forecast, Reality, Counterfactual