

Discussion of
“Sentiment and the Business Cycle”, Fabio Milani

Hikaru Saijo (UC Santa Cruz)

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- **Question:** Impact of “animal spirits” for business cycles
- **Model:** Two deviations from standard, rational expectations, DSGE models
 - ① Learning about law of motion of endogenous variables
 - ② Sentiment shocks
- **Methodology:** Bayesian estimation using survey expectations
- **Result:** Sentiment shocks account for $\approx 50\%$ of fluctuations at business cycle frequencies
- **My discussion:**
 - ① Alternative look at data and mechanism
 - ② What are the “sentiment” shocks?

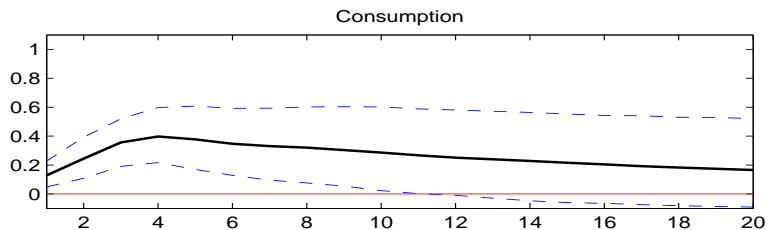
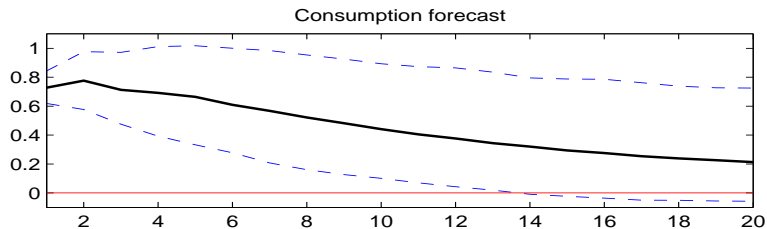
VAR analysis of sentiment shocks

- Bivariate VAR with 4 lags:

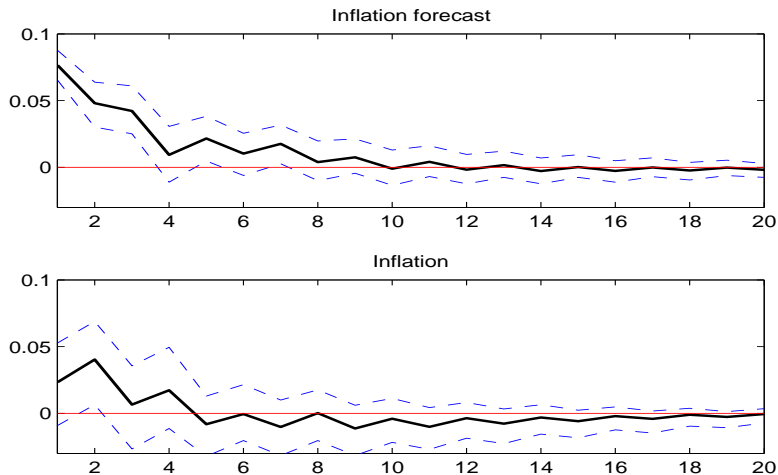
$$\mathbf{Y}_t = \mathbf{c} + \mathbf{\Pi}_1 \mathbf{Y}_{t-1} + \cdots + \mathbf{\Pi}_4 \mathbf{Y}_{t-4} + \epsilon_t$$

- Model 1: $[Y_{1,t} Y_{2,t}]' = [\text{SPF consumption forecast, consumption}]'$
- Model 2: $[Y_{1,t} Y_{2,t}]' = [\text{SPF inflation forecast, inflation}]'$
- Cholesky identification
- Sentiment shocks: shocks to SPF forecasts $u_{1,t}$

Impulse response to consumption sentiment shock



Impulse response to inflation sentiment shock



A simple New Keynesian model with sentiment shocks

$$c_t = E_t c_{t+1} - \sigma^{-1}(i_t - E_t \pi_{t+1})$$

$$\pi_t = \beta E_t \pi_{t+1} + \kappa c_t$$

$$i_t = \rho i_{t-1} + (1 - \rho)\phi \pi_t$$

$$E_t c_{t+1}$$

$$E_t \pi_{t+1}$$

A simple New Keynesian model with sentiment shocks

$$c_t = \tilde{E}_t c_{t+1} - \sigma^{-1}(i_t - \tilde{E}_t \pi_{t+1})$$

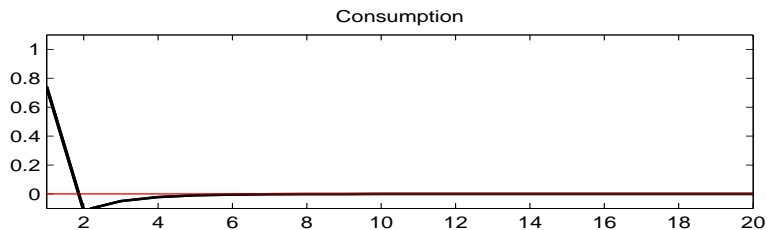
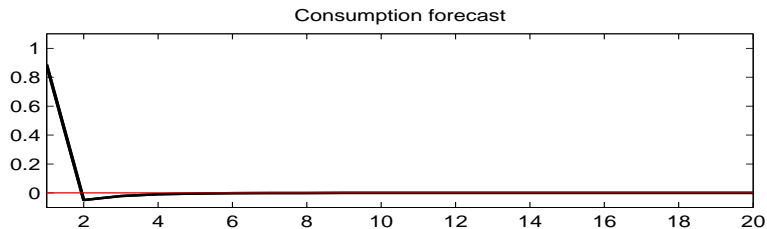
$$\pi_t = \beta \tilde{E}_t \pi_{t+1} + \kappa c_t$$

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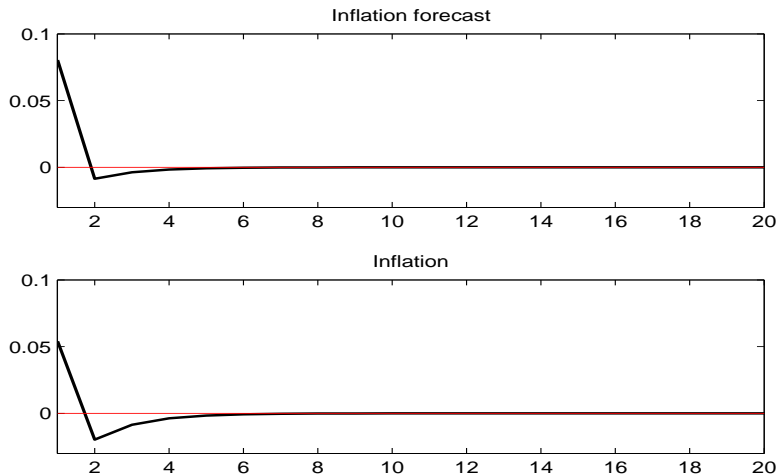
$$\tilde{E}_t c_{t+1} = E_t c_{t+1} + \epsilon_{c,t}, \quad \epsilon_{c,t} \sim i.i.d.N(0, \sigma_c^2)$$

$$\tilde{E}_t \pi_{t+1} = E_t \pi_{t+1} + \epsilon_{\pi,t}, \quad \epsilon_{\pi,t} \sim i.i.d.N(0, \sigma_\pi^2)$$

Impulse response to consumption sentiment shock



Impulse response to inflation sentiment shock



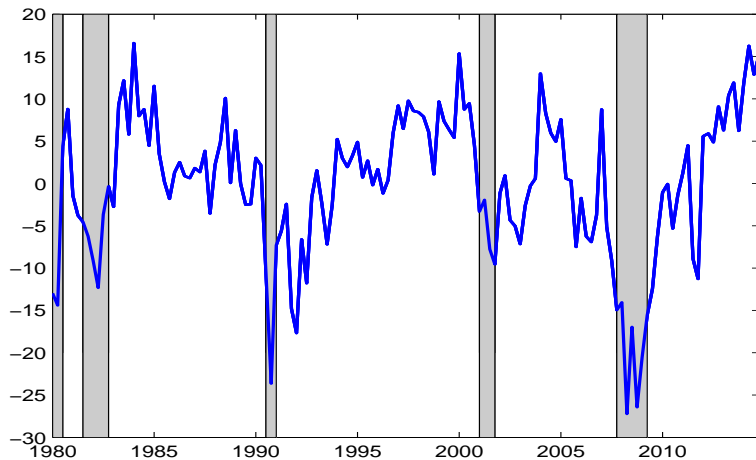
Discussion

- Model IRFs replicate signs but miss persistence: Fabio's model has
 - ▶ Learning
 - ▶ Persistence in sentiment shocks
 - ▶ Additional rigidities (habit, sticky wages etc)
- Potential identification problem:
 - ▶ Consumption sentiment shock looks like a shock to the Euler equation (demand shock)
 - ▶ Inflation sentiment shock looks like a shock to the Phillips curve (cost push shock)
- Fabio's solution: use survey data on expectations!

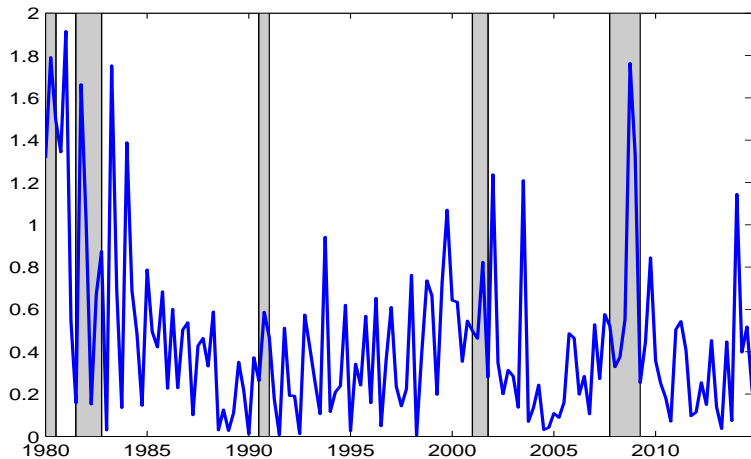
Discussion

- Where do these sentiment shocks come from?
- My preferred interpretation: sentiments reflect agents' **uncertainty about their forecasts**
- High uncertainty \longrightarrow low confidence about baseline forecast \longrightarrow entertain more pessimistic forecast
- Possible reasons:
 - ▶ Agents put more weight on pessimistic outcome through $u'(c_{t+1})$
 - ▶ Ambiguity aversion: set of forecasting models

Purified consumer sentiment



Q/Q GDP growth forecast error



Conclusion

- Serious & ambitious work that explores the role of psychological factors in business cycles
- Various ingredients required to fit the model to data
- Moving forward: micro-foundation for sentiments
 - ▶ Important for policy