Discussion of
"Sentiment and the Business Cycle", Fabio Milani

Hikaru Saijo (UC Santa Cruz)

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Paper

- **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
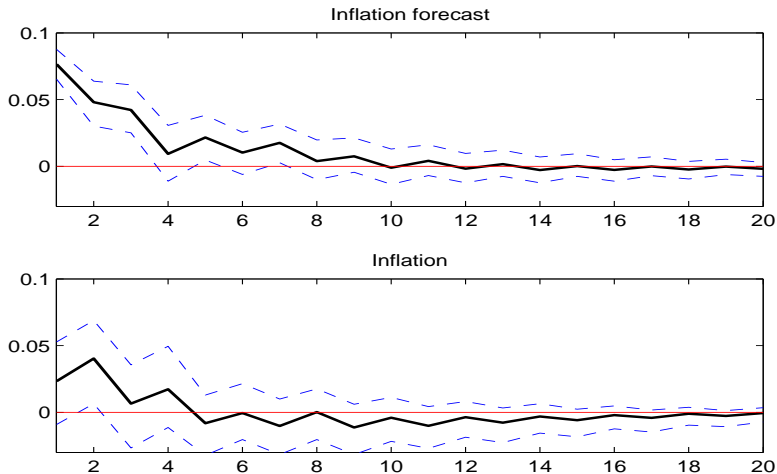
- Bivariate VAR with 4 lags:

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

- Model 1: $[Y_{1,t}\, Y_{2,t}]' = [\text{SPF consumption forecast}, \quad \text{consumption}]'$

- Model 2: $[Y_{1,t}\, Y_{2,t}]' = [\text{SPF inflation forecast}, \quad \text{inflation}]'$

- Cholesky identification

- Sentiment shocks: shocks to SPF forecasts $u_{1,t}$

Impulse response to consumption sentiment shock

Consumption forecast

Consumption
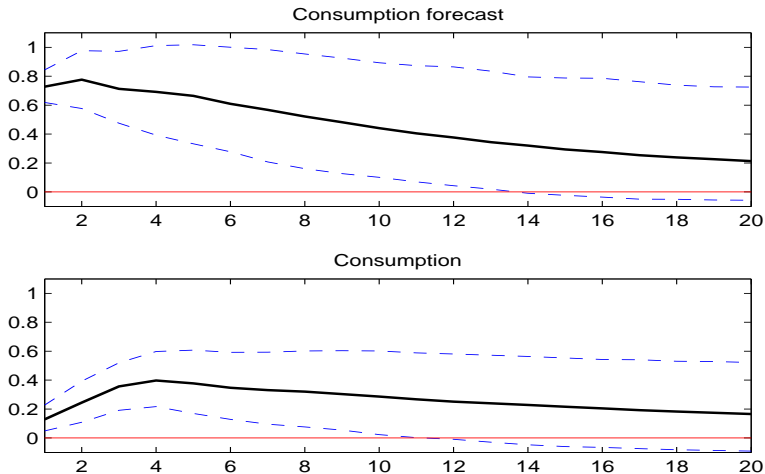
Impulse response to inflation sentiment shock

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

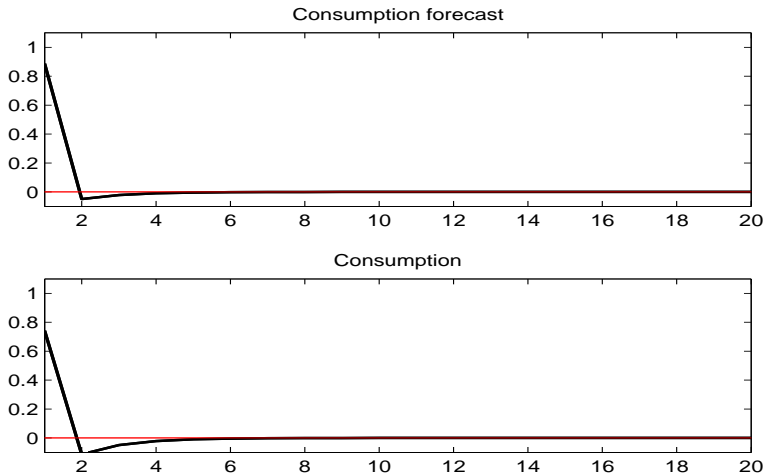$$c_t = \tilde{E}_t c_{t+1} - \sigma^{-1}(i_t - \tilde{E}_t \pi_{t+1})$$

$$\pi_t = \beta \tilde{E}_t \pi_{t+1} + \kappa c_t$$
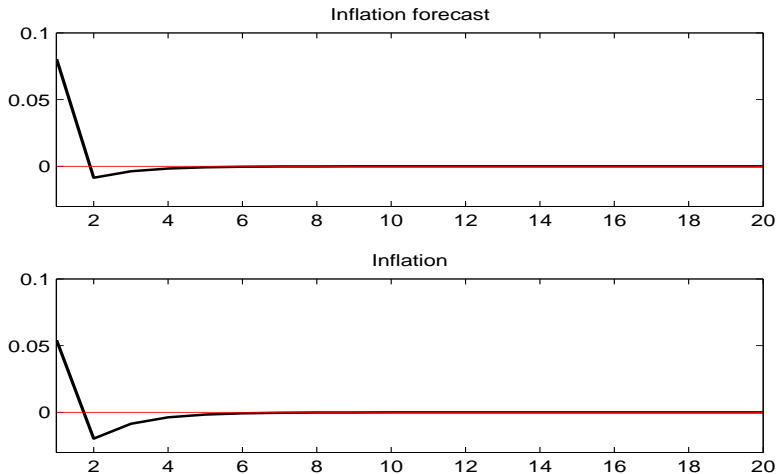
$$i_t = \rho i_{t-1} + (1 - \rho)\phi \pi_t$$

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

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

Impulse response to consumption sentiment shock

Consumption forecast

Consumption

Impulse response to inflation sentiment shock

Inflation forecast

Inflation

# 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
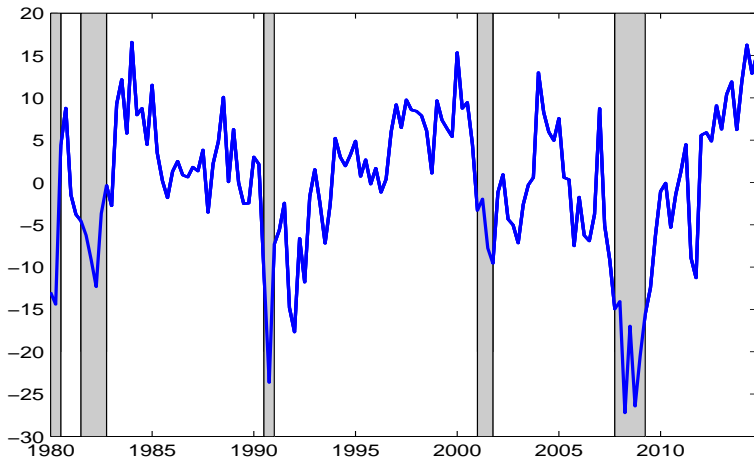
Q/Q GDP growth forecast error
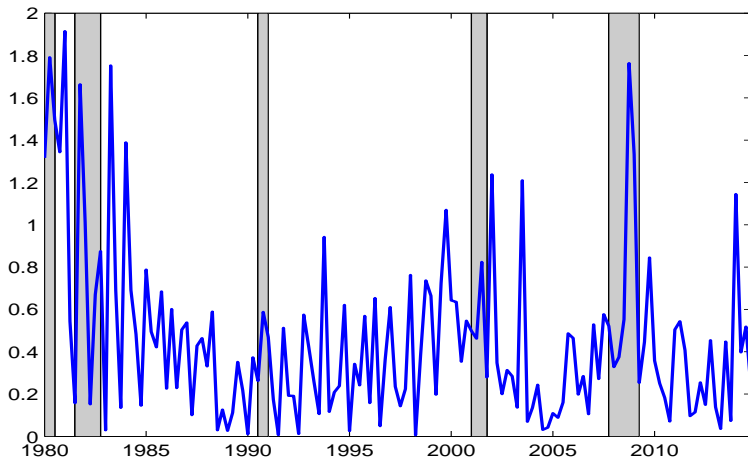
Conclusion

- 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