Discussion of "Ambiguous Business Cycles"

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Expectations and the business cycle

- uncertainty shocks

  (Bloom, Bloom et al, Fernandez-Villaverde et al, Basu & Bundick, etc)

- news/noise shocks

  (Beaudry & Portier, Jaimovich & Rebelo, Christiano, Ilut et al, Lorenzoni, Barsky & Sims, etc)

- sentiments

  (Angeletos & La'O)

Ambiguity and the business cycle

- "ambiguity" about the productivity process

  $\longrightarrow$ as if (irrationally) pessimistic beliefs

- time-varying "worst-case scenario"

  $\longrightarrow$ fluctuations in pessimism

- break RE, but with some discipline

A simple model: preferences

$$\mathcal{U}_t = u(C_t, N_t) + \beta \min_{p \in P_{t+1}} \mathbb{E}_p[\mathcal{U}_{t+1}]$$

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$$u(C_t, N_t) = \frac{1}{1-\gamma} C_t^{1-\gamma} - N_t$$

A simple model: technology

$$C_t = e^{z_t} K_t$$

$$K_{t+1} = N_t$$

A simple model: risk and ambiguity

$$z_{t+1} = \rho_z z_t + \mu_t + u_t \qquad u_t \sim \mathcal{N}\left(-\tfrac{1}{2}\sigma^2, \sigma^2\right)$$

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$$\mu_t \in [-a_t, a_t]$$

$$a_t = (1 - \rho_a)\bar{a} + \rho_a a_{t-1} + \epsilon_t$$

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$$\mu_t \in [-a_t, a_t]$$

$$a_t = (1-\rho_a)\bar{a} + \rho_a a_{t-1} + \epsilon_t$$

- belief $p \in P_{t+1}$ indexed by μ_t
- set P_{t+1} indexed by a_t

Results

$$n_t = k_{t+1} = (\theta - 1)\left(\rho_z z_t - \tfrac{1}{2}\gamma\sigma^2 - a_t\right)$$

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$$\begin{aligned} \rho_z z_t &\longrightarrow \text{expected return} \\ -\tfrac{1}{2}\gamma\sigma^2 &\longrightarrow \text{risk adjustment} \\ -a_t &\longrightarrow \text{ambiguity adjustment} \end{aligned}$$

Results

$$n_t = k_{t+1} = (\theta - 1)\left(\rho_z z_t - \tfrac{1}{2}\gamma\sigma^2 - a_t\right)$$

$$c_{t+1} = \theta\rho_z z_t + (\theta - 1)\left(-\tfrac{1}{2}\gamma\sigma^2 - a_t\right) + u_{t+1}$$

- both z_t and a_t shocks cause persistent fluctuations
- ambiguity shocks isomorphic to
  - γ shocks
  - irrational pessimism
  - a tax/wedge on savings
- in standard RBC, they'd fail to generate positive co-movement

Results

- decentralization: trade capital (stocks) and bonds
- if bond is "unambiguously" safe $\longrightarrow$
  - higher a_t raises risk premium and reduces risk-free rate
  - looks like "Euler wedge shocks"
- but "tax on saving" if ambiguity about default

Embedding Ambiguity Shocks in DSGE

- same basic idea, but embedded in a DSGE a la Smets-Wooters
- impressive!
- very tractable, because linearity preserved ($\longrightarrow$Dynare)
- in preferred parameterization (estimation), ambiguity shocks account for a large fraction of the business cycle

Comment 1: Identification/Discipline

- identification?
- how do we chose the a_t process?
- why not i.i.d? why not negative autocorrelation?
- how separate from productivity/news/risk shocks?
- discipline not sufficiently clear (to me)

Comment 2: Comovement

- comovement?
- "news shocks" vs "Euler wedge shocks" ?
- internal habit, investment adjustment costs?
- suboptimal monetary policy?

Comment 3: Interpretation

- ambiguity shocks versus
  - irrational biases ?
  - γ or σ shocks ?
- first-order versus second-order effects
  - an artifact of "extreme risk aversion" ?
  - why care?
- convenient proxies for uncertainty / risk aversion shocks?

Comment 4: confidence, pessimism

- a theory of time-varying pessimism
- but what about optimism?
- what explains waves of optimism and pessimism?

Comment 5: confidence, sentiment

- this paper (and rest of the literature):

  confidence/sentiment = beliefs of fundamentals

- my own preferred way forward:

  confidence/sentiment = beliefs of economic activity

Concluding remarks

- impressive contribution!
- from basic insights to complete DSGE implementation
- want more on interpretation and explanatory power