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
  → as if (irrationally) pessimistic beliefs

- time-varying "worst-case scenario"
  → fluctuations in pessimism

- break RE, but with some discipline
A simple model: preferences

\[ U_t = u(C_t, N_t) + \beta \min_{p \in P_{t+1}} \mathbb{E}_p[U_{t+1}] \]
A simple model: preferences

\[ U_t = u(C_t, N_t) + \beta \min_{p \in P_{t+1}} E_p[U_{t+1}] \]

\[ u(C_t, N_t) = \frac{1}{1-\gamma} C_t^{1-\gamma} - N_t \]
A simple model: technology

\[ C_t = e^{zt} K_t \]

\[ K_{t+1} = N_t \]
A simple model: risk and ambiguity

$$z_{t+1} = \rho z_t + \mu_t + u_t \quad u_t \sim \mathcal{N} \left( -\frac{1}{2} \sigma^2, \sigma^2 \right)$$
A simple model: risk and ambiguity

\[ z_{t+1} = \rho z_t + \mu_t + u_t \quad \text{where} \quad u_t \sim \mathcal{N} \left( -\frac{1}{2} \sigma^2, \sigma^2 \right) \]

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

\[ a_t = (1 - \rho_a) \bar{a} + \rho_a a_{t-1} + \epsilon_t \]
A simple model: risk and ambiguity

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

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

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

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

\[ n_t = k_{t+1} = (\theta - 1) \left( \rho_{zt} - \frac{1}{2} \gamma \sigma^2 - a_t \right) \]
Results

\[ n_t = k_{t+1} = (\theta - 1) (\rho_z z_t - \frac{1}{2} \gamma \sigma^2 - a_t) \]

- \( \rho_z z_t \rightarrow \) expected return
- \( -\frac{1}{2} \gamma \sigma^2 \rightarrow \) risk adjustment
- \( -a_t \rightarrow \) ambiguity adjustment
\[ n_t = k_{t+1} = (\theta - 1) \left( \rho_z z_t - \frac{1}{2} \gamma \sigma^2 - a_t \right) \]

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

- both \( z_t \) and \( a_t \) shocks cause persistent fluctuations
- ambiguity shocks isomorphic to
  - \( \gamma \) 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 →
    - higher $a_t$ raises risk premium and reduces risk-free rate
    - looks like “Euler wedge shocks”

- but “tax on saving” if ambiguity about default
same basic idea, but embedded in a DSGE a la Smets-Wooters

impressive!

very tractable, because linearity preserved (→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?
  - $\gamma$ or $\sigma$ 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