Discussion of:
“Uncertainty shocks, asset supply and pricing over the business cycle”
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Set up and estimate “small-scale”, flex-price DSGE model with:

1. Financial frictions, endogenous leverage choice
2. Time-varying ambiguity: stochastic confidence and volatility

Ambitious and technically impressive:

- business cycles, asset prices and financial frictions
- estimation using stock price data!
Discussion

1. Model
2. Estimation
Financial frictions

Standard ingredients:

1. 1 period risk-free debt, tax advantage
2. Cost of adjusting dividends
3. Increasing cost of debt
4. Shock to cash-flow $f$

Concavity $\Rightarrow$ smooth debt and equity payouts

Microfoundations for these ingredients?
Stochastic structure

- Agents ambiguous about:
  - mean of TFP and mean of cash flow shock $f$
- Do not form prior - worst case scenario

\[
\log f_t = (1 - \rho) \log \bar{f} + \rho \log f_{t-1} + \mu_f + \sigma_f,t \varepsilon_{f,t}
\]

\[
\mu_f \in [-a_t, a_t]
\]

\[
a_t = \eta_{f,t} \sigma_{f,t}
\]

- Ambiguity driven by confidence $\eta$ and uncertainty $\sigma$
- $\eta_{f,t}, \sigma_{f,t}$ are 2-state Markov chains
- TFP similar, but (i) some continuous shocks to $a$, (ii) direct correlation with level of TFP
Stochastic structure

Motivation for this formulation:
- psychology
- model detection probability
- regime switches in volatility

Still:
- specification seems somewhat arbitrary
- empirical motivation?
- are we modeling ambiguity about the right things?
- no high-frequency changes in volatility
Solve discrepancy between model and surveys ER

- Data: low asset prices forecast high (excess) returns
- A standard rational asset pricing story:
  - higher uncertainty $\Rightarrow$ higher risk premia $\Rightarrow$ lower prices
  - hence, reproduce data correlation
- But if you survey investors...
  - when prices are low, people expect low returns, not high returns!
    - Amromin and Sharpe, Greenwood and Scheifer
- Ambiguity can help!
  - agents pessimistic about cash flows $\Rightarrow$ lower prices
  - agents’ expected return roughly constant
  - realized return higher than expected return
To fit asset prices, we need investors to have wildly varying beliefs:

- expectations of very high future growth
- very large uncertainty about future
- risk of Great Depression
- here: confidence varies

Many of these shocks have similar implications
Distinguishing among them possible with RE...
Confidence shock is the residual, unobservable
Estimation Results

- Fit 5 variables:
  - Investment
  - Debt/Equity
  - Equity/GDP
  - Dividends/GDP
  - risk-free rate

- Only 2 shocks $Z, f +$ Markov switches.
Key results

- Big role of shocks to $f$ in accounting for stock market changes
  - shock has almost no effect on investment...
- Replicate behavior of debt vs. equity payouts
  - Higher ambiguity $\rightarrow$ ↓ debt, ↑ equity payout
  - High cash flows $\rightarrow$ ↑ debt, ↑ equity payout
- Few volatility switches, more frequent confidence switches
Questions we’d like estimation to answer

- Does the model fit?
- Are parameters plausible?
- Does fitting asset prices matter for business cycles?
- Counterfactuals: do financial frictions matter?
- Counterfactuals: policy?
- Which mechanism is important for asset price variation?
Setting up a horse race?

- Estimation procedure forces a bit the results:
  - data: equity/gdp moves a lot
  - model: “only” reason it can move is shock to ambiguity
  - volatility is observable ex-post
  - hence, confidence acts as a residual

- Volatility matters only through effect on ambiguity

- More ambitious: allow competing explanations:
  - e.g. shocks to trend growth, volatility (w/ high risk aversion), disaster risk, measurement error
Summary

- Ambitious, technically impressive paper
  - motivate more the specification of ambiguity
- Emphasis on estimation
  - need more interpretation of parameters/results
  - would like horse race between potential explanations of stock market behavior