Discussion On

Asset Trading and Valuation with Uncertain Exposures

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Paper Summary

How information asymmetry may help to understand asset prices:

- Risk premium
- Volatility
- Return dynamics
- Trading volume

Key Aspects of the Model

Assumptions:

- Static setting
- General preferences
- Agents are heterogeneity in two dimensions:
  - (a) Endowments
  - (b) Private signals about future state of the economy
- Two states (for the most part)

Results

Comparing equilibrium under two different information structures:

1. Full information: All signals are available to all agents
2. Asymmetric information: Each signal is available only to one agent

In the case of asymmetric information

- Lower price level (higher risk premium)
- Higher price volatility
- Stronger price reversal
- Lower trading volume

An Example

A special case – Diamond and Verracchia (1981):

- Risky asset (stock) payoff:

$$V = S + u$$

- Agents' endowments: 1 share of stock and additional payoff $z_i u$, where

$$z_i = Z + \varepsilon_i, \quad i \in [0, 1]$$

- Private signal about stock payoff:

$$s_i = S + n_i$$

- Agents have utility over terminal wealth with CARA

$$-e^{-\alpha W}$$

- All shocks are jointly normal and mutually independent

Agents trade to

(a) share risk and

(b) speculate on private information

Linear equilibrium:

$$P = aS - bZ - c = a[S - (b/a)Z] - c = a\,\xi - c, \quad \xi = S - b'Z$$

Agent i's information:

$$\phi_i = \begin{bmatrix} s_i \\ z_i \\ \xi \end{bmatrix}$$

- Agent i's belief (S remains normal conditional on ϕ_i):

$$\mathrm{E}[S|\phi_i] = \beta\phi_i, \quad \mathrm{Var}[S|\phi_i] = \widehat{\sigma}_S^2$$

- His stock demand:

$$x_i = \frac{\mathrm{E}[V|\phi_i] - P}{\widehat{\sigma}_S^2 + \sigma_u^2} - \frac{\sigma_u^2}{\widehat{\sigma}_S^2 + \sigma_u^2} z_i$$

- In equilibrium:

$$\begin{aligned} P &= \int_i \mathrm{E}[V|\phi_i] - \left(\widehat{\sigma}_S^2 + \sigma_u^2\right) - \left(\sigma_u^2 + \frac{\widehat{\sigma}_S^2}{\sigma_u^2\sigma_Z^2}\right) Z \\ &= \frac{\sigma_S^2 - \widehat{\sigma}_S^2}{\sigma_S^2} S - \left(\widehat{\sigma}_S^2 + \sigma_u^2\right) - \left[\sigma_u^2 + (1-\gamma)\frac{\widehat{\sigma}_S^2}{\sigma_u^2\sigma_Z^2}\right] Z \end{aligned}$$

Two extreme cases:

- Full information (FI): $\widehat{\sigma}_S = 0$
- No information (NI): $\sigma_n = \infty$ and $\widehat{\sigma}_S = \sigma_S$

Comparing the different cases:

- $\mathrm{E}[P^{FI}] > \mathrm{E}[P] > \mathrm{E}[P^{NI}]$
- $\mathrm{Var}[P^{FI}] > \mathrm{Var}[P] > \mathrm{Var}[P^{NI}]$
- $\mathrm{Cov}[\Delta P_0^{FI}, \Delta P_1^{FI}] < \mathrm{Cov}[\Delta P_0, \Delta P_1] < \mathrm{Cov}[\Delta P_0^{NI}, \Delta P_1^{NI}]$

Comments

- There are two aspects of a given information structure:
  - Amount of information available to each agent
  - Difference in information among agents

  It is important to distinguish the impact of the two
- Robustness—where this paper can contribute
- Nonlinearity—more to explore
  - Interaction between price levels and volatility
  - Endogenous levels of information asymmetry and its impact
- Dynamics