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:
  1. Endowments
  2. 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 $\phi_i$):

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

His stock demand:

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

In equilibrium:

$$P = \int_i E[V|\phi_i] - \left(\hat{\sigma}_S^2 + \sigma_u^2\right) - \left(\sigma_u^2 + \frac{\hat{\sigma}_S^2}{\sigma_u^2 \sigma_Z^2}\right) Z$$

$$= \frac{\sigma_u^2 - \hat{\sigma}_S^2}{\sigma_u^2 S} - \left(\hat{\sigma}_S^2 + \sigma_u^2\right) - \left[\sigma_u^2 + (1 - \gamma) \frac{\hat{\sigma}_S^2}{\sigma_u^2 \sigma_Z^2}\right] Z$$
Two extreme cases:

- Full information (FI): $\hat{\sigma}_S = 0$

- No information (NI): $\sigma_n = \infty$ and $\hat{\sigma}_S = \sigma_S$

Comparing the different cases:

- $E[P^{FI}] > E[P] > E[P^{NI}]$

- $\text{Var}[P^{FI}] > \text{Var}[P] > \text{Var}[P^{NI}]$

- $\text{Cov}[\Delta P_0^{FI}, \Delta P_1^{FI}] < \text{Cov}[\Delta P_0, \Delta P_1] < \text{Cov}[\Delta P_0^{NI}, \Delta P_1^{NI}]$
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