Discussion
Variation margins, fire sales, and information-constrained optimality
by Bruno Biais, Florian Heider, Marie Hoerova

Eduardo Dávila

Yale and NBER

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Summary

- Question
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  - Rich but tractable setup
  - Main contributions
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    2. Normative results with moral hazard and general equilibrium

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        2. Normative results with moral hazard and general equilibrium
- Main results
    - Incentive problems may call for margins
    - Margin calls may induce liquidations/fire sales
    - Complete markets $\Rightarrow$ Second-best efficiency
    - Incomplete markets $\Rightarrow$ Second-best inefficiency

Environment: Agents

1. Protection Buyers (banks)
   - ▶ Risk averse
   - ▶ Preexisting position to hedge (binomial distribution, $\bar{\theta}$, $\underline{\theta}$)
   - ▶ Public signals $\bar{s}$, $\underline{s}$ informative over $\bar{\theta}$ and $\underline{\theta}$

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   - Risk neutral
   - Moral hazard problem
     - Unit cost of effort ψ (interpretation)
     - Effort is efficient (R payoff)
     - If no effort, R with probability μ, 0 otherwise
     - $\mathcal{P} = R - \frac{\psi}{1-\mu} > 0$

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- Timing
  - Signal, transfer/sale, effort

Planning Problems

- ▶ Four benchmarks

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1. First Best (planning problem)
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2. Second Best (planning problem)
   - ▶ Full insurance between Protection Buyers and Investors
   - ▶ Imperfect insurance between them and Protection Sellers
   - ▶ Conditional on signal, full insurance
   - ▶ Signals and Protection Buyers/Investors consumption are correlated
   - ▶ IC binds after bad signal: <u>less benefit to exert effort when sellers have to pay out</u>
   - ▶ Asset transfer α_S set to trade off incentive constraint with investor inefficiency

Market Equilibrium w/Complete Markets

3. Market Equilibrium w/Complete Markets for publicly observed variables
   - ▶ Protection Buyer as principal with full bargaining power
   - ▶ New IC:
     $$\alpha_S p + (1 - \alpha_S)\, \mathcal{P} \geq \mathbb{E}\left[\tau\left(\tilde{\theta}, \tilde{s} | \underline{s}\right)\right]$$
   - ▶ Price p of assets
   - ▶ Signal contingent market, price q
   - ▶ Main result: Market Equilibrium is information-constrained efficient (Prop 5)
     - ▶ "Information-constrained Second Welfare Theorem"
     - ▶ Why? Low prices tighten IC of Sellers after bad signals, but gives more resources to investors
     - ▶ Investors have zero welfare weight (competitive interpretation?), so complete markets takes care of the rest

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   - ▶ **Comment:** I would love to see a variational argument for this result

Market Equilibrium w/Incomplete Markets

4. Market Equilibrium w/Incomplete Markets for signals
   - Equilibrium is information-constrained inefficient (Prop 6)
   - Margins are too large (too much selling)
   - Sale price is too low after bad signal
   - "Distributive externality" (using DK18 terminology) between Protection Buyers and Investors
     - MRS differences, net buying/selling, price impact

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- **Comment:** I would like to see a "doubly-constrained-inefficient benchmark"
  - I think it is too evident that the incomplete markets outcome will be worse than the complete markets outcome
  - I'm sure the paper is also constrained inefficient in the incomplete markets (Hart75, GP86) sense

Other Comments/Thoughts

1. Making the model more symmetric
   - Two-sided moral hazard
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2. Relation to literature
   - Different message from Gromb-Vayanos
     - Somewhat different framework (limits to arbitrage)
     - Different friction: limited commitment vs. moral hazard **(broader point, literature needs to work more here)**
     - Incentives to shirk high when payouts are large – relation to default incentives in Kehoe-Levine/Rampini-Vishwanathan and incomplete market default models
   - Incomplete markets results can be expanded
   - Closer in spirit to Prescott-Townsend/Kilenthong-Townsend
     - "Let them trade"
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     - In PT84, moral hazard yields constrained efficiency (individual markets)
3. Why do agents have to sell, couldn't they just post other collateral/cash?
   - More broadly, what if there are multiple assets? Which one should be posted?