

Why Trade Over-the-Counter? When Investors Want Price Discrimination

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Overview

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▶ **Mechanism:**

- ▶ Informed investors create adverse selection in the market
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▶ **Main results:**

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 - ▶ Investors labeled as informed investors (speculators) trade in exchanges
 - ▶ Investors labeled as uninformed investors (hedgers) trade OTC (not anonymous)

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 - ▶ Investors labeled as informed investors (speculators) trade in exchanges
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- ▶ Spreads increase in the degree of adverse selection
- ▶ Welfare may increase or decrease with OTC depending on adverse selection

The model

- ▶ One indivisible asset with unobserved value $\tilde{v} \in \{-1, 1\}$
- ▶ Three types of agents: competitive dealer, competitive market maker (MM) and investors
- ▶ Investors can either buy or sell one unit of asset w/ equal probability
 - ▶ Hedgers: get private benefit b_i if they sell (buy) when they are sellers (buyers)
 - ▶ Speculators: no private benefit, private information about the asset value
- ▶ Two trading venues
 - ▶ Exchange: MM posts bid and ask prices, same for everyone
 - ▶ OTC: investor requests quotes from dealer, quotes are investor specific

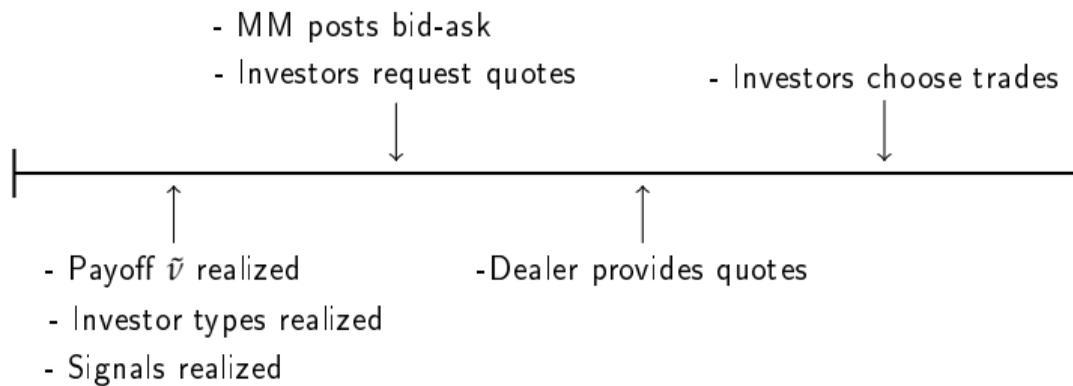
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- ▶ Friction: Asymmetric information, Three sources
 - ▶ Speculators receive private signals about \tilde{v} **Adverse Selection**
 - ▶ Imperfect type labels for each investor **Allows to break anonymity** OTC
 - ▶ Hedgers have private unobserved valuations b_i **Elastic demand**

Timing



Trading strategies

- ▶ At the available bid and ask prices, investors have three options: buy, sell, no trade.
 - ▶ Payoff from selling in venue j

$$bid_j + \text{private benefit}_i - \mathbb{E}[v | \text{Information}_i]$$

- ▶ Payoff from buying

$$\mathbb{E}[v | \text{Information}_i] - ask_j$$

- ▶ from not trading 0

- ▶ Investors sells

$$\max \left\{ \underbrace{0}_{\text{no trade}}, \max_{j \in J^i} \left\{ \underbrace{\mathbb{E}[v | \text{Information}_i] - ask_j}_{\text{buy in venue } j} \right\} \right\} < \max_{j \in J^i} \left\{ \underbrace{bid_j + \text{private benefit}_i - \mathbb{E}[v | \text{Information}_i]}_{\text{sell in venue } j} \right\}$$

- ▶ An investor buys if

$$\max \left\{ 0, \max_{j \in J^i} \{ bid_j - \mathbb{E}[v | \text{Information}_i] \} \right\} < \max_{j \in J^i} \{ \mathbb{E}[v | \text{Information}_i] + \text{private benefit}_i - ask_j \}$$

Adverse Selection and Price Discrimination

- ▶ Half bid-ask spread in exchange without OTC market

- ▶ No informed investors $\mu = 0$

$$\hat{S}_e = 0$$

- ▶ With informed investors $\mu > 0$

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⇒ Uninformed investors want to separate from informed investors

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- ▶ OTC gives some uninformed investors the opportunity to separate (labels are observed!)

- ▶ Investors labeled as speculators trade in the exchange and investors labeled as hedgers trade OTC
 - ▶ Lower adv. selection in OTC + competitive dealer: OTC spread is lower

$$S_e > \hat{S}_e > S_o$$

- ▶ Adverse selection increases all spreads
 - ▶ Welfare can increase or decrease with OTC

Comments

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 - ▶ Hedgers private valuation: Elasticity of demand

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- ▶ Welfare **cost** of adverse selection: Non-realized hedging trades

$$\underbrace{(1 - \gamma) \int_0^{S_e} bdb}_{\text{hedgers labeled as speculators}} + \underbrace{\gamma \int_0^{S_o} bdb}_{\text{hedgers labeled as hedgers}} = \frac{1}{2} \left((1 - \gamma) S_e^2 + \gamma S_o^2 \right)$$

- ▶ Adverse selection increases all spreads but differently: $S_i = s(\beta_i)$, where $s' > 0$ and $s'' < 0$ and

$$\beta_e \geq \hat{\beta}_e \geq \beta_o.$$

- ▶ Effect of OTC depends on adverse selection
 - ▶ Result: If $\mu < \mu^*$, welfare decreases with OTC markets and it increases otherwise.

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- ▶ Effect of OTC depends on adverse selection
 - ▶ Result: If $\mu < \mu^*$, welfare decreases with OTC markets and it increases otherwise.
- ▶ Intuitively: Having OTC markets
 - ▶ increases trades of hedgers with correct labels who trade OTC
 - ▶ decreases trades of hedgers with incorrect labels who trade in the exchange
 - ▶ Overall effect depends on distributional assumptions

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4. Empirical predictions and other theories

Extra

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