Sender-Receiver Games

Disclosure Games

Disclosure games

–Grossman (1981): The Informational Role of Warranties and Private Disclosure about Product Quality. *Journal of Law and Economics.*
–Milgrom (1981): Rational Expectations, Information Acquisition, and Competitive Bidding. *Econometrica.*

One Seller has a car of privately known quality type $\theta \in \{L, H\}$

Many Buyers with valuation v_θ, with $0 < v_L < v_H$

Game:

1. Seller sends one message from **type-dependent** message set: $m \in M(\theta) = \{\theta, \emptyset\}$
2. Buyers observe message m and form belief $\mu(m)$ over $\{L, H\}$
3. Seller gets market price $p = \mathbb{E}_{\theta \sim \mu(m)}[v_\theta]$ (=expected buyer value)

Disclosure games

Disclosure games – Unravelling in the Milgrom-Grossman model

More than two types: Suppose $\Theta = \{\theta_1 < \cdots < \theta_n\}$ or $\Theta = \left[\underline{\theta}, \bar{\theta}\right]$ (with increasing $v(\theta)$)

Argument works with **other evidence structures:** e.g.,
$M(\theta) = \{$any subset $m \subset \Theta$ with $\theta \in m\}$
$M(\theta) = \{\theta' \in \Theta$ with $\theta' \leq \theta\}$

Disclosure games – Dye-evidence

–Dye (1984): Disclosure of nonproprietary Information. *Journal of Accounting Research*

Suppose seller types are $\Theta = \left[\underline{\theta}, \bar{\theta}\right]$ with increasing v_θ and evidence

$$M(\theta) = \begin{cases} \{\theta, \emptyset\} & \text{with prob. } \gamma \\ \{\emptyset\} & \text{with prob. } 1-\gamma \end{cases}$$

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In equilibrium:

- **seller**-types in set $T \subset \Theta$ send message $m = \theta$ **if they can**
  other types, in $T^C = \Theta \setminus T$ send $m = \emptyset$ **always**
- **buyer**/market pays the seller the expected value
  - with message θ: $\mathbb{E}\left[v_{\tilde{\theta}} \mid m = \theta\right] = \mathbb{E}\left[v_{\tilde{\theta}} \mid \tilde{\theta} = \theta\right] = v_\theta$
  - with message $\emptyset$: $\mathbb{E}\left[v_{\tilde{\theta}} \mid m = \emptyset\right] = \mathbb{E}\left[v_{\tilde{\theta}} \mid \tilde{\theta} \text{ has no evidence } \bigcup \ \tilde{\theta} \in T^C\right]$

Disclosure games – Dye-evidence

Disclosure games – Dye-evidence – Application to stock market

- Firm value $\theta \in \{5, 10\}$ with $\lambda = \mathbb{P}[\theta = 5]$
- **Two periods:**

  t=1: With prob γ, manager learns θ and chooses to disclose $m = \theta$ or $m = \emptyset$
  With prob $1 - \gamma$, manager learns nothing and discloses $m = \emptyset$

  t=2: Firm value θ becomes public
- Share price $p_t =$ expected value conditional on all public information at (end of) period t.
- Manager wants to maximise share price

Exercise:

a) What is the optimal choice for the manager in $t = 1$ conditional on θ?

b) What is the share price in $t = 1$ conditional on m?

c) Consider the change from p_1 to p_2. Are bad or good news followed by higher volatility?

d) Suppose the manager's info is always public. How do answers to (b) and (c) change?