MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Department of Economics

14.129 - Contract Theory, Fall 1999

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- Hidden Information
  - Screening: one principal and one agent
  - Multiple agents (auctions, bargaining)
  - Agent:
    - Has private info.
    - Private info affects marginal rate of substitution between money and action/allocation
  - Principal:
    - Writes contracts, offers menus
    - Can't observe agent types; no private info.
  - Contract is a menu of pairs (x, t)
    - x activity, decision, or allocation
    - t transfer from A to P
    - ex: $\{(x_{i,}t_i), (x_n, t_n)\}$
  - Private info (A) $\theta \in \Theta$
    - ex: $\{\theta_H, \theta_L\}$; $\{\theta_1 ... \theta_n\}$; $[\underline{\theta}, \overline{\theta}]$
    - Distribution of types in the population: $\{p_H, p_L\}$, $\{p_1, .., p_n\}$, $F(\theta)$

– Preferences:

$$\begin{aligned} A &: u(x,\theta) - t \\ P &: v(x,\theta) + t \end{aligned}$$

In most examples,

$$v(x,\theta) = v(x)$$

– Reservation utility for the agent is normalized to zero

– Social surplus:

$$s(x,\theta) = u(x,\theta) + v(x)$$

- Examples

  – Taxation (Mirrlees)

    * A-workers; P-government
    * x income earned
    * θ ability
    * $u(x,\theta)$ - net utility from earnings x

$$\begin{aligned} u(x,\theta) &= \max_{e,c} \ \hat{u}(e,c,\theta) \\ \text{s.t.} \quad pc &\leq x;\ x \leq g(e,\theta)w \end{aligned}$$

    * v is overall utility of principal; choose $x(\theta)$, $t(\theta)$

$$v = \int \lambda(\theta)\left[u(x,\theta) - t(\theta)\right] f(\theta) d\theta$$

    * (x,t) is a tax schedule

- Procurement (Baron-Myerson)
  - A-supplier; P-buyer (government)
  - x quantity
  - θ production cost
  - $u(x, \theta) = -c(x, \theta)$ (cost of producing x)
  - $t = -p$ (price)
  - principal's utility: $v(x)$

- Employment, insurance, etc.
- Nonlinear Pricing
  - A-customer; P-monopolist
  - $x = q$ quantity
  - $u(q, \theta)$
  - θ marginal utility
  - $t = p$ price
  - principal's utility: $-c(q)$