RET

In every standard auction, the expected payment of a bidder of valuation v equals $t^*(v) = \int_{\underline{v}}^{v} x g(x)\,dx$

$g(x) = G'(x)$

$G(x) = F^{n-1}(x)$ → depend on number of bidder.

x on format of auction

and so the seller's expected revenue is the same.

△ important use: derive equilibrium bid function in SI

↳ First Price Auction:

$b^*(v)$ common equilbrium bid function.

expected payment of a bidder of type v.

$t^*(v) = G(v)\, b^*(v) + (1 - G(v)) \cdot 0$

↓ prob of winning

$G(v)\, b^*(v) = \int_{\underline{v}}^{v} x g(x)\,dx.$

△ $b^*(v) = \dfrac{\int_{\underline{v}}^{v} x g(x)\,dx.}{G(v)}$

(1) $b^*(v)$ is strictly increasing

(2) $b^*(v) < v$ for all $v > \underline{v}$

bid shading

3) $F(v) = v \quad \underline{v} = 0, \ \bar{v} = 1$

$G(v) = v^{n-1}$

$g(v) = (n-1) v^{n-2}.$

$\int_{\underline{v}}^{v} x g(x)\,dx = \int_{\underline{v}}^{v} (n-1) x^{n-1}\,dx = (n-1)\dfrac{x^n}{n}\Big|_0^v$

$= \dfrac{(n-1) v^n}{n}$

$b^*(v) = \frac{n-1}{n} v$ => how much shades the bid.

↳ $n \uparrow \rightarrow b^*(v) \uparrow$

All pay auction

$b^*(v) = t^*(v) = \int_{\underline{v}}^{v} x g(x) dx$

ex $F(v) = v$. $(v \in [0,1])$

$b^*(v) = \int_{\underline{v}}^{v} x g(x) dx = \frac{(n-1)v^n}{n}$

Review

Start: efficiency

↳ exchange market

Pareto efficiency (define efficiency)

△ allocation that can not be pareto improved.

another allocation that makes no person worse off

and makes at least one person strictly better off.

characterize: if changed, at least one is worse off.

↳ gains from trade

△ If an allocation is PO, then it maximizes gains from trade.

$V(n) = \sum_{i=1}^{n} (v_i - c_i)$

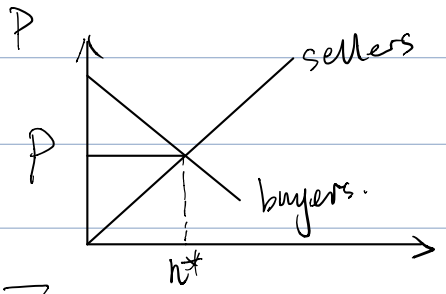
n^* maximizes $V(n)$ increasing n^* up to when $v_i - c_i < 0$.

⇑ not uniquely determined if $v_i = c_i$ happens.

if volume is determined, the pattern is not uniquely determined.

(if $v_i \neq c_i$) (who hold the good)

△ Correction between PO and CE (competitive equilibrium)



at competitive equilibrium ⇐ what is ? check.

Bench Mark ! under perfect info,

(many PO → same final holdings of goods).

highest valuations.

Will ever get there ?

Brokers. molopoly (single broker necessarily match).

↳ the objective : max brokerage commision (not for society).

(fixed fee. δ

(cost : k

2 effects

1) traditional monopoly: broker want to set $\delta > k$.

2) other effect : broker wants at high of a trasaction volume as possible.

↳ acchieve by opposite matching

(high b <=> high s)

If $\delta \geq k$, the broker volume ≥ efficient volume.

Asymmetric info => can be a barrier to trade.

intuition explict the difference between the asking & offer price

(buyer will shade the offer

| seller will overstate the cost.

case where $v \in [0,1]$, $c \in [0,1]$

⇒ revelation principle

$p(c,v)$ $t(c,v)$

prob of trade ↑ expected payment ↑.

truthtelling is DSE in deterministic direct mechanism.

iff it is a single price equilibrium (only one).

when is an asymmetric bad enough ⇒ inefficiency.

Auction

△ SPA ① bid truthfully ⇒ DSE (why)

(bid not effect the price you pay).

② reserve price

③ optimal RP not depend on number of bidders.

by !!! ⇒ (marginal price of winning bidder is 0)

only when RP is binding.

$\pi(r) = (r-c)(1-F(r))$

↑ RP is binding