Beyond the Coasian Irrelevance: Wealth Constraints

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Che and Gale (2006)

- Binding financial constraints (or “wealth constraints”) makes the initial assignment of properties relevant, and yield some useful implications on non-market assignment and restriction on transfer rights.

Issues

- Can we justify non-market assignment of initial ownership?
- If so, how should we structure the assignment scheme?
- What are the tradeoffs for limiting transfer rights (or alienability).

Existing Justifications for Nonmarket Mechanisms

- Redistributive goals (e.g., Wijkander, Weitzman)
- Second-best argument: Market equilibrium not Pareto Optimal because of some distortion (e.g., Guesnerie-Roberts)

None of these consider resale; not concerned about the assignment of initial ownership.

Existing Justifications for Inalienability

- Externalities + Transaction costs (Calabresi and Melamed)
  - Barring polluters
  - Moralism
  - Paternalism

Preview of Results

When agents are wealth constrained,

- Nonmarket assignment (of transferable goods) can be justified on allocative efficiency grounds.
- Favoring the poor in the assignment is desirable, justifying need-based programs.
- Identify the cost of “alienability” in the form of “speculation activities”; Limiting it may be justified in some cases.
- Asymptotic Coase theorem.

Model

- A unit mass of risk-neutral buyers who each demand one unit, and mass $m \geq 0$ of non-buyers ("rest of the population").
- A buyer has a type, (w, v)

  w = wealth $\in [0,1] \sim G(w)$

  v = valuation $\in [0,1] \sim F(v)$

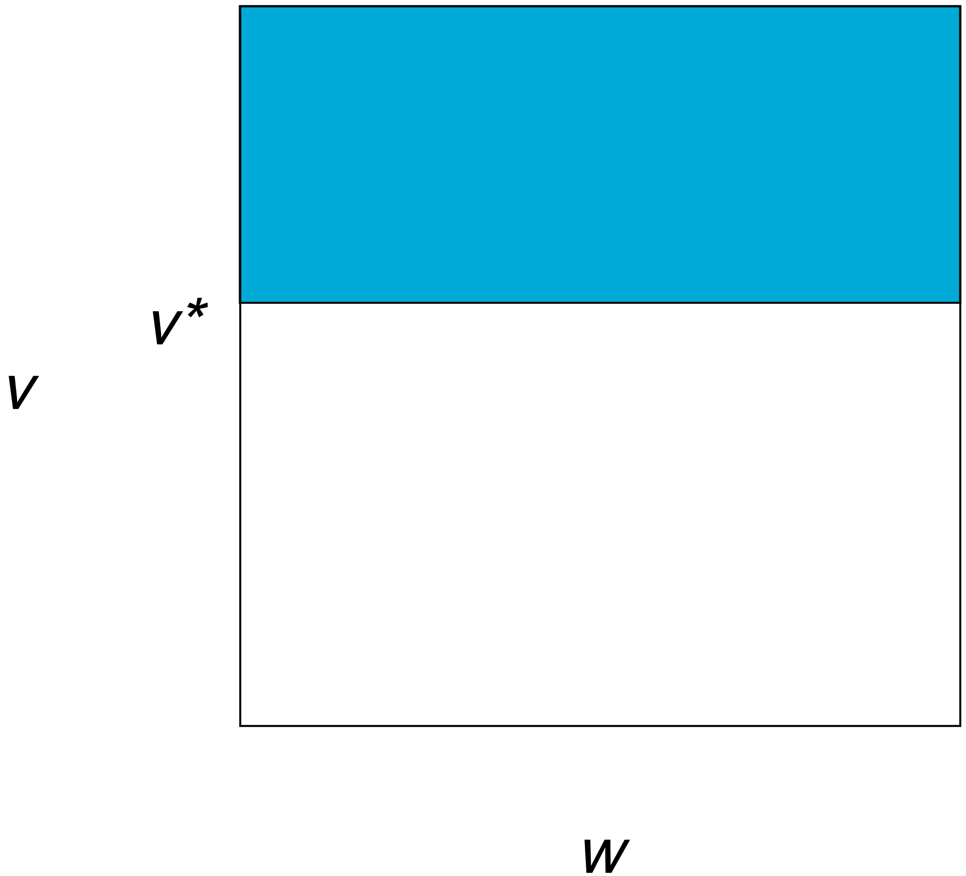
  (profit or consumption value)
- A non-buyer has the same w distr and $v = 0$.
- Quasilinear preferences
- The (indivisible) good is supplied elastically at zero marginal cost, up to industry capacity, $S \in (0,1)$.

Welfare Criterion

- Utilitarian efficiency: Total realized value (or average value realized per unit)
  - Ex ante perspective ("Vickrey test"):

    What would an individual choose should she have an equal chance of landing in the shoes of each member of the society?
- First-best benchmark: buyers with $v \geq v^*$ are served, where v^* satisfies $S = 1 - F(v^*)$.
- Average value realized = $E[v | v \geq v^*]$.

First-best Allocation



Three Mechanisms

- A competitive market: (*resale right doesn't matter*).
- Nonmarket (random) assignment without resale: price is capped and a lottery assigns the good; not allowed to resell.
- Nonmarket with resale: same as above except resale is permitted after assignment.

Not a mechanism design exercise (cf. Che and Gale (1999)).

Examples

- Housing in Korea: Nonmarket with resale previously; competitive market now.
- School choice: market and nonmarket; no resale.
- Military recruitment under draft:
  - Nonmarket without resale (Vietnam);
  - Nonmarket with resale (Civil war).
- Government resources: all three used.
- Immigration visas: Nonmarket without resale.

Competitive Market

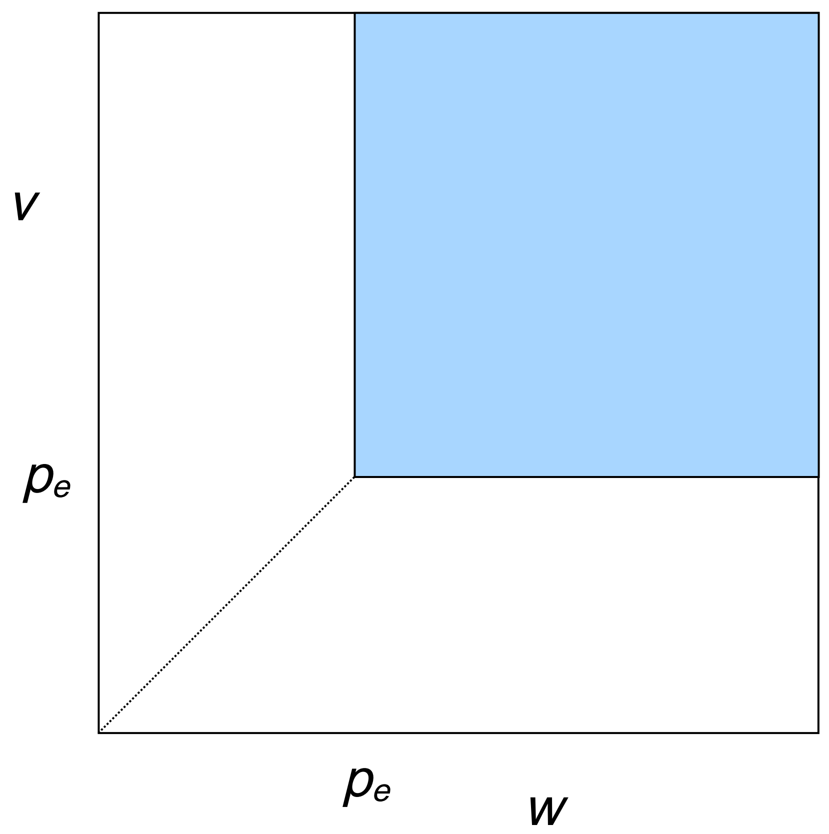
- Demand = number of buyers *willing and able* to pay the price

  $D(p) = [1 - F(p)][1 - G(p)]$

- Supply = S

- Equilibrium price: p_e satisfying $D(p_e) = S$.

Competitive Market Equilibrium



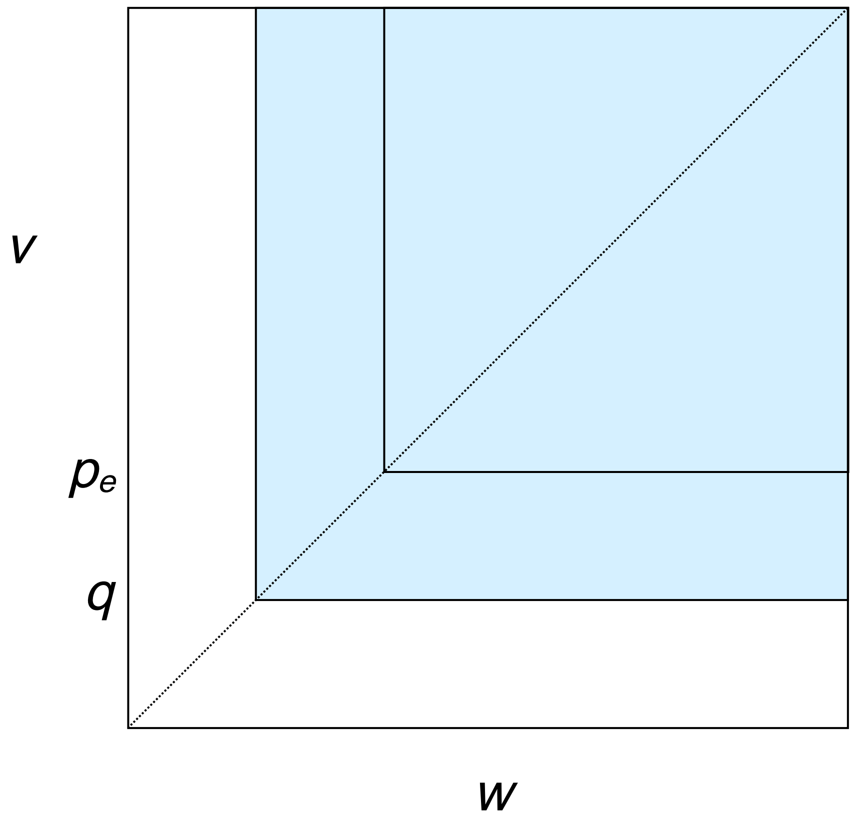
- Average value realized: $E[v|\ v \geq p_e]$.

Nonmarket without Resale

- The price is capped at $q < p_e$ and excess demand is assigned randomly (i.e., a lottery, with one entry per participating agent).

- Buyers with $(w, v) \geq (q, q)$ participate in the rationing and are successful with probability S/[(1- $F(q)$)(1- $G(q)$)].

Nonmarket without Resale



- Average value realized: $E[v|\ v \geq q] < E[v|\ v \geq p_e]$.

Nonmarket (random) assignment without Resale

- Random assignment without resale is less efficient than the market.

- Intuition: Random assignment allows buyers with low wealth to consume, *but also those with low valuations*.

Nonmarket (random) with Resale

- Price is capped at $q < p_e$ and excess demand is rationed randomly; *resale is permitted*.
- Suppose the resale price, r, is higher than q (if not, there would not be rationing).
- All buyers and even "non-buyers" with $w \geq q$ will participate in rationing.

Nonmarket (random) assignment with Resale

- All buyers with $(w, v) > (q, 0)$ participate; each gets the good with probability

$$\rho(q, m) = S/[(1 + m)(1 - G(q))]$$

$$\rightarrow 0 \text{ as } m \rightarrow \infty$$

- Resale Market:
  - *Demand side: Unsuccessful buyers purchase at the resale price, r, if* $(w, v) \geq (r, r)$.
  - *Supply side: Successful buyers/non-buyers with* $v < r$ *sell.*
- *Measure of buyers:* $[1 - F(r)][1 - G(r)](1 - \rho(q, m))$.
- *Measure of sellers:* $S \cdot (F(r) + m)/(1 + m)$.

Resale Market Equilibrium

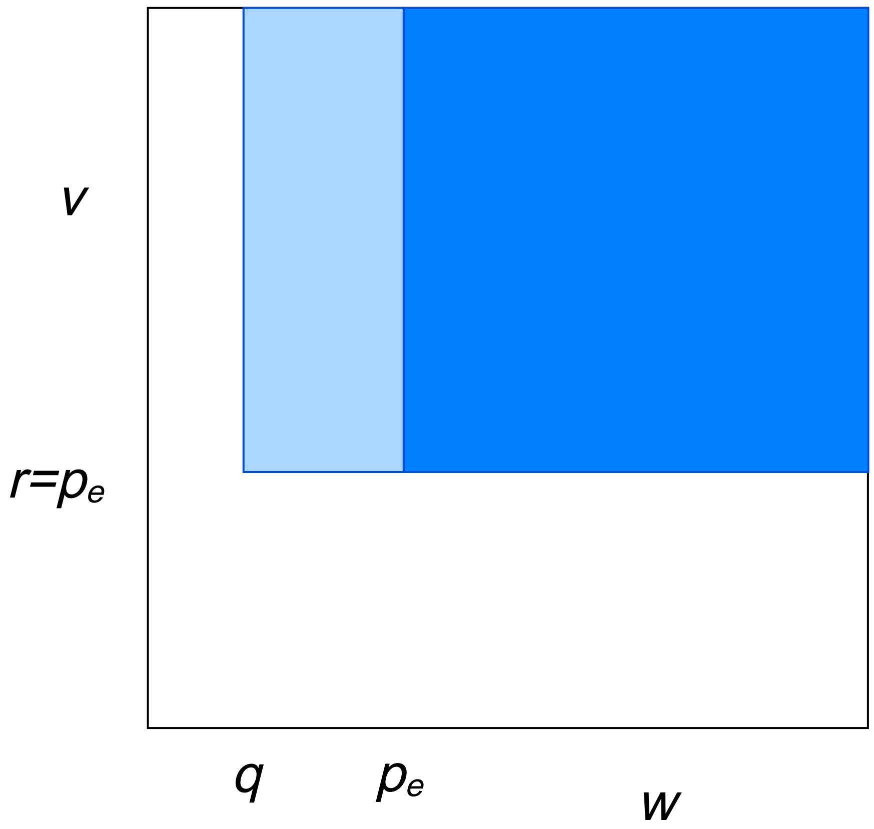
$$[1 - F(r)][1 - G(r)](1 - \rho(q, m)) = S \cdot (F(r) + m)/(1 + m).$$

$$\Leftrightarrow D(r) = S - \rho(q, m)[1 - F(r)][G(r) - G(q)]$$

$\Rightarrow$ equilibrium resale price: $r^*(q, m) > p_e$.

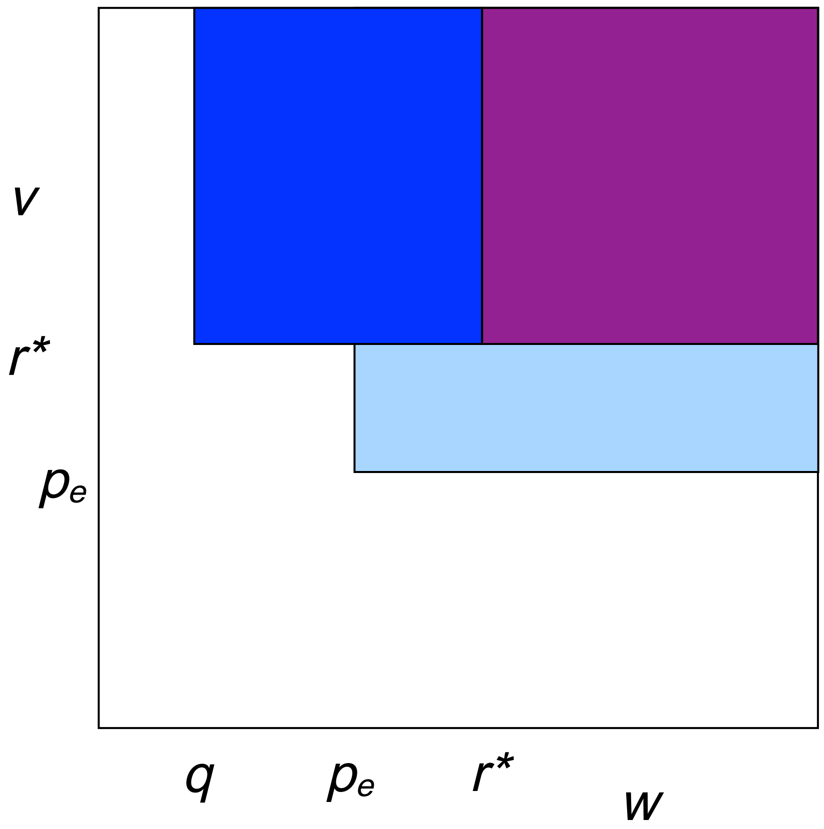
- *Average value*: $E[v | v \geq r^*] > E[v | v \geq p_e]$.
- *Lower q and lower m raise the average value realized.*
- *As $m \to \infty$, $r^* \to p_e$. (will generalize to the Asymptotic Coase theorem)*

Random/Resale versus the Market



There would be excess demand if $r^* = p_e \Rightarrow r^* > p_e$.

Rationing/Resale versus the Market



Intuition

- Coase theorem doesn't apply if *individuals are wealth constrained*.
- Allocating the good to the poor improves efficiency since only the wealthy can buy on the resale market.
- Random assignment with resale does a better job than the market in allocating ownership to the poor.
- *Can do even better than random assignment if resale is permitted (e.g., need-based programs, affirmative action…)*
- Speculation limits this benefit and virtually wipes it out if there are many potential speculators.

A More General Assignment Rule

- Separability: A type-(v,w) buyer is assigned the good with probability $x(w,v)= a_x(w)b_x(v)S$.
- Non-concentration: The fraction of supply assigned to any set of agents (buyer and non-buyers) participating is of the same order as the proportion of its measure to the total measure of individuals participating in the assignment.
- Example (type contingent rule):

  $x(w,v)/x(w',v')$ = some positive constant

  whenever (w,v), (w',v') both participate

Merit- and Need-dominance

- An assignment rule, x, *merit-dominates* an assignment rule, y, if x assigns a higher probability to high-valuation buyers than y does (*FOSD*).
- An assignment rule, x, *need-dominates* y if x is more likely to allocate the good to low-wealth buyers than y is (*FOSD*).

Nonmarket without Resale

- For any cap $q < p_e$, only buyers with $(w, v) \geq (q, q)$ participate. Non-buyers never do.
- If x [strictly] merit-dominates y, then x yields [strictly] higher value than y.
- Any assignment rule merit-dominated by the merit-blind rule is strictly less efficient than the market.
- There exists a (non-concentrating) assignment rule strictly more efficient than the market.

Discrete Example

Assume $S = ½$.

w / v	$w_L < 1$	$w_H > 2$
2	¼	¼
1	¼	¼
0	(½)m	(½)m

- Efficient Allocation: Only buyers with $v = 2$ get the good.
- Competitive Market: Only high wealth get the good with $p = 1$.

  ⇒ Average value realized: **3/2.**

- Nonmarket w/o Resale: Set $q = w_L$; A buyer with $v = 2$ is twice as likely to get the good as $v = 1$, who is in turn twice as likely to get the good as $v = 0$ (if all participate). Of course, $v = 0$ never participate.

  ⇒ Average value realized: **5/3 > 3/2.**

Nonmarket with Resale

- The assignment rule, x, *relatively merit-dominates* y if, for any $v' > v$, $b_x(v')/b_x(v) \geq b_y(v')/b_y(v)$.

- x is *meritorious* if it relatively merit-dominates a merit-blind rule (i.e., $b_x(v') \geq b_x(v)$ for all $v' > v$).

Nonmarket with Resale – cont'd

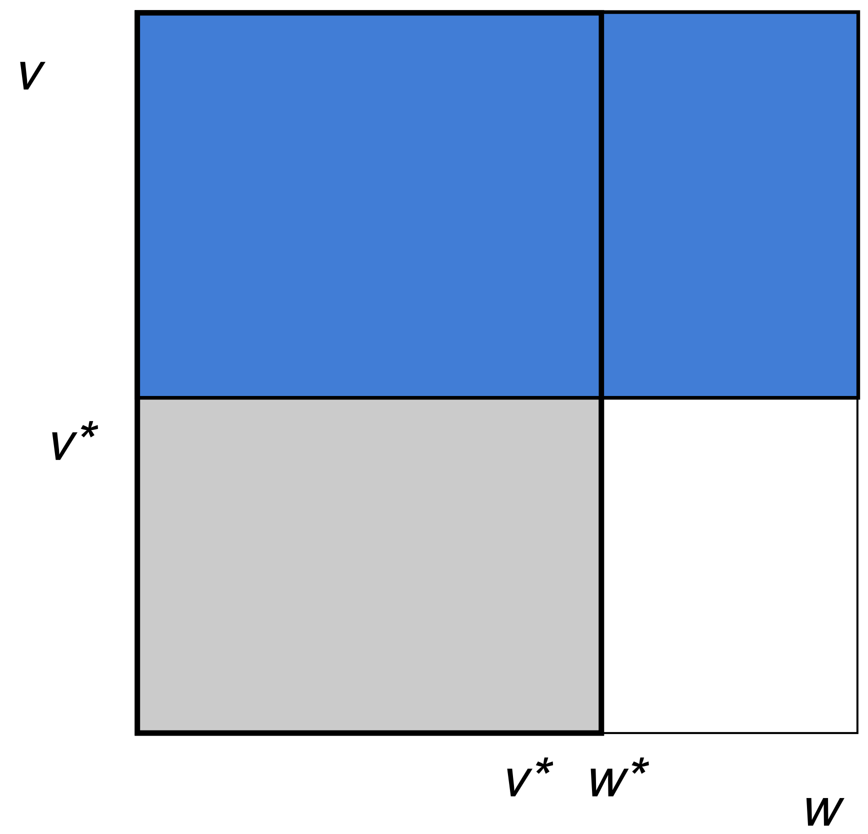
- For any cap $q < p_e$, all buyers and non-buyers with $w \geq q$ participate.
- Any meritorious assignment rule produces a strictly more efficient allocation than the competitive market.
- Lowering the price cap increases efficiency, given a meritorious assignment technology.

Benefit of Need-based Assignment

- If *x* relatively merit-dominates and need-dominates *y*, then *x* has a (weakly) higher total realized value than *y* does.

- *Full efficiency may be possible if the good is allocated to the poorest buyers.*

Efficiency of Need-based Assignment



- Need-based assignment
- Efficient allocation

Restricting Transfer Rights

- Asymptotic Coase theorem: Any non-concentrating assignment rule (i.e., ownership distribution) leads to the same allocation (as the market), as $m \to \infty$.

- Prohibiting resale (i.e., inalienability) is desirable for some non-concentrating assignment rule if $m > M$ for some $M > 0$.

Discrete Example

Assume $S = \frac{1}{2}$.

w / v	$w_L < 1$	$w_H > 2$
2	¼	¼
1	¼	¼
0	(½)m	(½)m

- Nonmarket w/o Resale: Same assignment rule; recall
  - ⇒ Average value realized: **5/3.**
- Nonmarket w/ Resale:
  - ⇒ Average value realized: (5+2m)/(3+2m)+(1+2m)/2(3+2m) → **3/2** < 5/3**.**

Extensions

- A Dual System with Nonmarket and a Market
- Regulation of Resale
- Pre-payment Resale
- Direct Subsidy vs. Nonmarket with Resale
- Social Cost of Speculation
- Elastic Supply

Conclusions

- Even imperfect nonmarket assignment improves efficiency when buyers are wealth-constrained, *if resale is permitted*
- Restricting resale may be desirable if the assignment rule is sufficiently meritorious and speculation potential is severe.
- With some assignment rules, allowing resale may be beneficial
  - Health care
  - Government auctions
  - Immigration visas
  - School Choice
- Lack of resale not an evidence of efficiency; nor its presence a sign of inefficiency.