# The Past, Present, and Future of the Research on Third-Degree Price Discrimination

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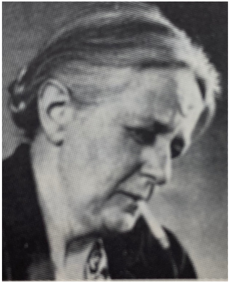
# Robinson (1933) *The Economics of Imperfect Competition*

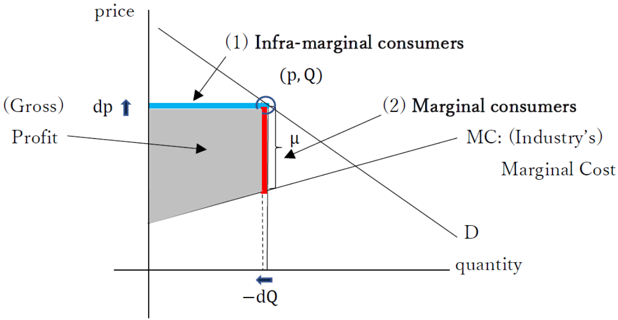
- "[I]f there is some degree of **market imperfection** there can be some degree of **price discrimination**." (p. 180)



Joan Robinson (1903-1983)

# A Price-Theoretic Perspective on Imperfect Competition

- Equilibrium Characterization (for **linear** pricing):




$$\underbrace{\theta \cdot (dp) \cdot Q}_{\text{(1) Maginal Gain}} = \underbrace{\mu \cdot (-dQ)}_{\text{(2) Marginal Loss}}$$

- $\theta \leq 1$: **Conduct "parameter"** $\leftarrow$ intensity of competition
- $\mu \geq 0$: **Markup** (or Profit Margin)

# “Micro-foundation” of the Conduct Parameter Approach

- There are $n$ symmetric firms.

- Each firm $j$ 's objective function is the sum of its own profit and the other firms' profits:

$$\widehat{\pi}_j = \pi_j + \kappa \sum_{k \neq j} \pi_k,$$

  where $\kappa \in [0, 1]$ measures the industry's “**attitude for cooperation**” (Shubik 1980).

  - Symeonidis (2008, *JEMS*) “Downstream Competition, Bargaining, and Welfare”
  - Matsumura, Matsushima, and Cato (2013, *Econ Modelling*) “Competitiveness and R&D Competition Revisited”
  - . . .

- Can allow for firm heterogeneity ($\kappa_j$).

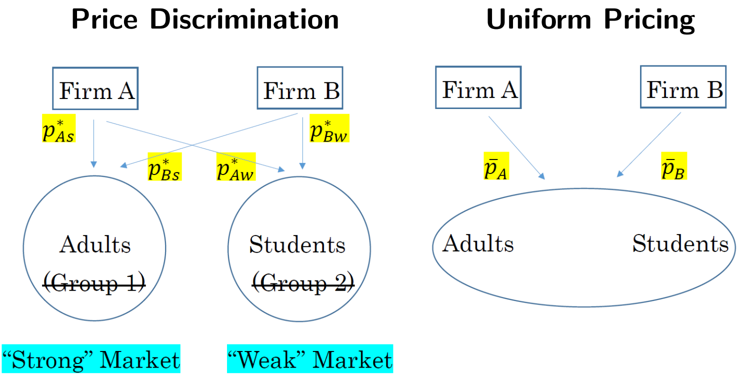
# What is Price Discrimination?

- *Price Discrimination* is "present when two or more identical units of the same products or services are sold at **different** prices, either to the same buyer or to different buyers." (Adachi 2007, p. 392)

# Taxonomy by Pigou (1920) *The Economics of Welfare*

- 1st-Degree PD: Each consumer pays their WTP (willingness-to-pay).
- 2nd-Degree PD: Each consumer self-selects into a different price schedule (nonlinear pricing).
- 3rd-Degree PD: Consumers are segmented into groups by unambiguous traits (**linear** pricing).

# Example: Student Discount

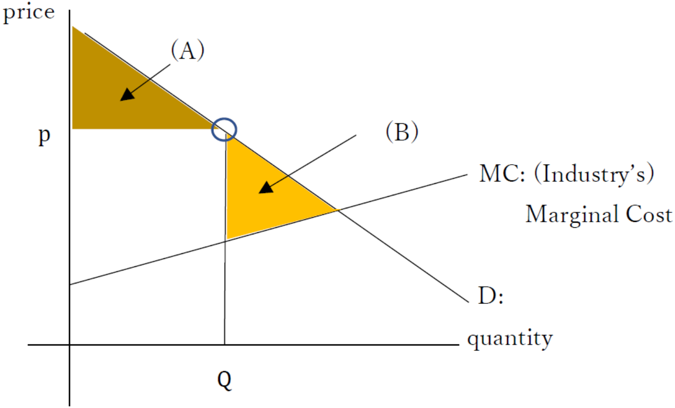



- Typically,

$$\text{Firm A:} \quad \underbrace{p^*_{As}}_{\text{"strong" market}} > \bar{p}_A > \underbrace{p^*_{Aw}}_{\text{"weak" market}}$$

$$\text{Firm B:} \quad \underbrace{p^*_{Bs}}_{\text{"strong" market}} > \bar{p}_B > \underbrace{p^*_{Bw}}_{\text{"weak" market}}$$

# Essence of (Linear) Price Discrimination




- Cabral (2017, p.122)
  - (A): "**Exploiting surplus**" from consumers who can pay more than *p* (reducing consumer surplus)
  - (B): **"Generating surplus**" from consumers with potential gains from trade (reducing deadweight loss)

# 1. Past

# A Centennial Tradition

- Generation I: Pigou (1920), Robinson (1933)
- Generation II:

  **Monopoly**: Schmalensee ('81 *AER*), Varian ('85 *AER*), Schwartz ('90 *AER*), Nahata, Ostaszewski, and Sahoo ('90 *AER*)

  **Oligopoly**: Holmes ('89 *AER*), Corts ('98 *RAND*)

  Surveyed by Varian ('89), Armstrong ('06, '08), Stole ('07)

- More recent studies:

  **Monopoly**: Cowan ('07; '12; '16; '18), Aguirre, Cowan, and Vickers ('10 *AER*), Chen and Schwartz ('15 *RAND*)

  **Oligopoly**: Dastidar ('06 *Manchester*), Chen, Li, and Schwartz ('21 *RAND*), Miklós-Thal and Shaffer ('21 *IJIO*)

# Sources of Inefficiency from PD

- Price Discrimination (PD):

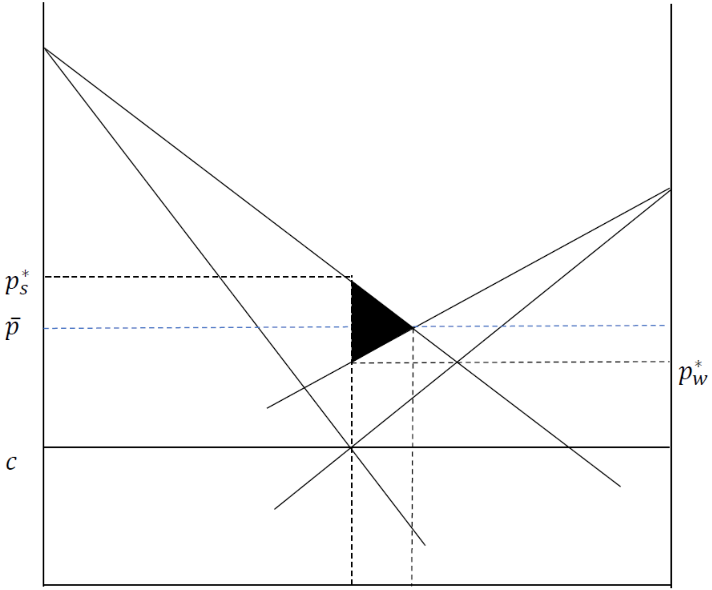
$$\frac{p_m - c}{p_m} = \frac{1}{\varepsilon_m(p_m)},$$

where $\varepsilon_m$ is the **price elasticity** in market $m \in \{s, w\}$.

- Aggregate output over all markets is too low because $p_m > c$.
- For a given level of aggregate output, PD typically generates **interconsumer misallocations** relative to uniform pricing.

  $\rightarrow$ Aggregate output is not efficiently distributed to the higher-value ends.

# Linear Demands (adapt from Layson 1988, *AER*, Fig 1)



# Welfare Implications

- In general,

  Increase in aggregate output is **necessary** for social welfare to improve.

(Varian ('85 *AER*), Schwartz ('90 *AER*), Bertoletti ('04 *JIndE*))

# Introducing Consumption Externalities

- Adachi ('02 *JIndE*; '05 *Economica*):

  In the presence of consumption externalities,
  PD can improve social welfare
  **even if** aggregate output doesn't change.

- What are Consumption Externalities?

  - As more people buy the good, their WTP increases or decreases.
  - "Network Effects," "Congestion," "Bandwagon or Snob Effects"

- Motivation:

  One's WTP depends on the **composition** of aggregate output, which will matter to welfare.

# Consumption Externalities *between* Markets

- WTP of consumer (at $x_m$) in market $m$:

$$a_m - x_m + \eta \cdot q_n^e$$

for $m, n = s, w; m \neq n$, $\eta \in (-1, 1)$.

- Adachi's (2002) results:

  - Aggregate output **doesn't** change.

  - Aggregate consumer surplus decreases by PD.

  - However, PD **does** improve Social Welfare iff $1/2 < \eta < 1$.

# Recent Contribution

- Hashizume, Ikeda, and Nariu (2021, *Econ Bulletin*) "Price Discrimination with Network Effects: Different Welfare Results from Identical Demand Functions"

- Inverse demand function:

$$a_m - (1+\zeta)x_m + \zeta q_m^e + \eta \cdot q_n^e,$$

derived from the representative consumer's utility

$$\begin{aligned} U &= a_s x_s + a_w x_w - (1+\zeta)\frac{x_s^2 + x_w^2}{2} \\ &\quad +\zeta(x_s q_s^e + x_w q_w^e) + \eta(x_s q_w^e + x_w q_s^e), \end{aligned}$$

where $\zeta > -1$ is **symmetric within**-market externality.

# Recent Contribution (cont'd)

- For $\zeta \geq 1/3$, PD **never** improves Social Welfare.
- For $\zeta \in (-1, 1/3)$, PD **does** improve Social Welfare iff
$$\frac{1+3\zeta}{2} < \eta < 1.$$
- Adachi's (2002) case, $\zeta = 0$, is nested.

# *Asymmetric* Within-Market Externalities

- WTP of consumer (at $x_m$) in market $m$:

$$a_m - x_m + \gamma_m \cdot q_m^e$$

for $m = s, w$, $\eta_m < 1$.

- Initial guess:

Social Welfare will improve if there are (large amounts) of **negative** consumption externality in the **strong** market & of **positive** consumption externality in the **weak** market.

$\rightarrow$ This is not the only case when PD improves social welfare.

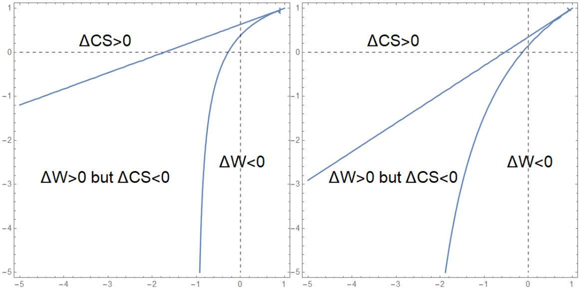
# *Asymmetric* Within-Market Externalities (cont'd)

- Adachi's (2005) results:
  - Aggregate output **doesn't** change.
  - PD **can** improve Social Welfare.
  - **Aggregate CS can increase by PD**.

# *Asymmetric* Within-Market Externalities (cont'd)

- Wlog, $a_s = 1$ (strong) & $a_w = a \in (0,1)$ (weak)

$a = 0.5$ $a = 0.75$




- For $\gamma_s > 0$ & $\gamma_w < 0$, $\Delta W < 0$.

- When $\gamma_s < 0$ & $\gamma_w < 0$, the **smaller** $a$, the larger is the area of $\Delta W > 0$.

- When $\gamma_s > 0$ & $\gamma_w > 0$ or $\gamma_s < 0$ & $\gamma_w > 0$, the **larger** $a$, the larger is the area of $\Delta W > 0$.

# *Asymmetric* Within-Market Externalities (cont'd)

- Intuition:
  - When $\gamma_s < 0$ & $\gamma_w < 0$, the **smaller** $a$, the larger is the area of $\Delta W > 0$.

    - The negative size effect on $|\Delta CS_s|$ is small because $\gamma_s < 0$.

    - Small $a$ is favorable because the effect of $\gamma_w < 0$ on $\Delta CS_w$ keeps small.
  - When $\gamma_s > 0$ & $\gamma_w > 0$ or $\gamma_s < 0$ & $\gamma_w > 0$, the **larger** $a$, the larger is the area of $\Delta W > 0$.

    - For $\gamma_w > 0$, when the size of the weak market is large, $\Delta CS_w$ is large enough.

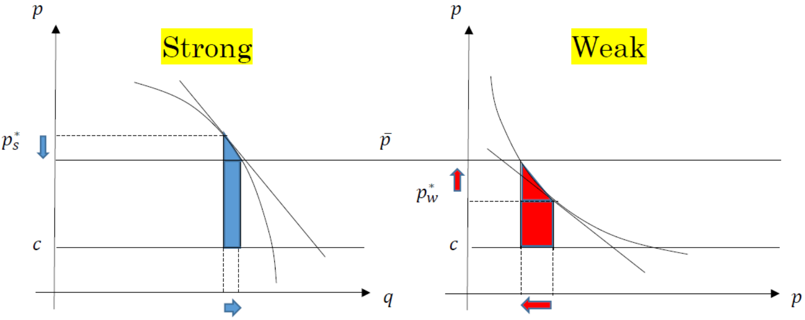
# Some Other Work

- Okada and Adachi (2013, *J Ind Comp Trade*) "Third-Degree Price Discrimination, Consumption Externalities, and Market Opening"
- Adachi and Matsushima (2014, *Econ Inqry*) "The Welfare Effects of Third-Degree Price Discrimination in a Differentiated Oligopoly"

# 2. Present

# Aguirre, Cowan, and Vickers (2010 *AER*, Prop 2)

- "If inverse demand in the weak market is more convex than that in the strong market at the discriminatory prices, then price discrimination raises social welfare."



# Adachi (2023, *IJIO*)

- Welfare and output effects of oligopolistic third-degree price discrimination in a **fairly general setting**:
  - **General demands**
  - **Cost differences** across discriminatory markets ($c_s \neq c_w$)
  - **Firm heterogeneity**

# Definition of Price Discrimination

- Here, price discrimination is defined by $p_s > p_w$ as above.
- Clerides (2004, *Econ Inquiry*, p. 402):
  (**Once cost differentials are allowed,**)
  "there is **no single, widely accepted definition of price discrimination**."
- Two other alternative definitions:
  1. **Margin** definition: $p_s - c_s > p_w - c_w$
  2. **Markup** definition: $p_s/c_s > p_w/c_w$
- Our definition is almost **identical** to the two definitions when $c_s - c_w$ is small.

# Methodology (1/2)

- Transform the **discrete** regime change to a **continuous** problem.

- Add the constraint $p_s - p_w \leq r$, where $r > 0$, to the firms' profit maximization problem.

- Consider $r \in [0, r^*]$, where

  $p_s - p_w = r$ is the price difference

  $r = 0$: **uniform pricing**

  $r = r^* \equiv p_s^* - p_w^*$: **price discrimination**

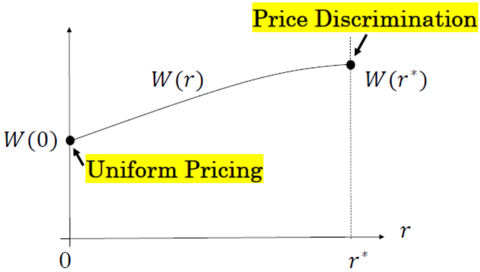
# Methodology (2/2)

- Aggregate output:

$$Q(r) = 2(q_s[p_s(r)] + q_w[p_w(r)])$$

- Social welfare:

$$W(r) = U_s(q_s[p_s(r)]) + U_w(q_w[p_w(r)]) \\ -2c_s \cdot q_s[p_s(r)] - 2c_w \cdot q_w[p_w(r)]$$



# Properties of $W(r)$

- Recall social welfare is expressed as:

$$W(r) = \sum_{m=s,w} U_m(q_m[p_m(r)]) - 2 \sum_{m=s,w} c_m \cdot q_m[p_m(r)]$$

- Define

$$z_m(p) \equiv \frac{(p - c_m)q'_m(p)}{\pi''_m(p)}$$

so that $\mathrm{sign}[W'(r)] = \mathrm{sign}\{z_w[p_w(r)] - z_s[p_s(r)]\}$.

- Interpretation: $(p - c_m)q'_m(p)$ is the **marginal effect of a price change on social welfare** in $m$:

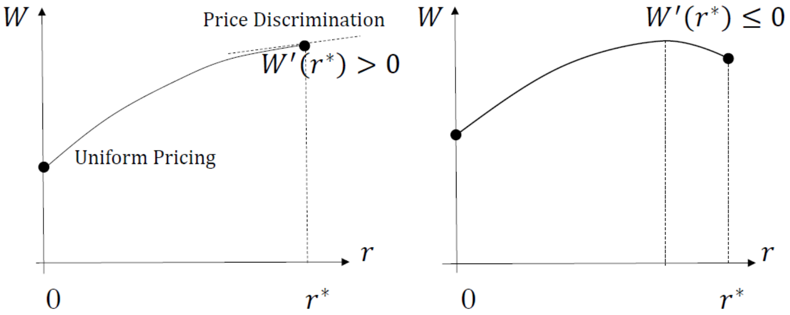
$$\frac{\mathrm{d}[\overbrace{\frac{1}{2}U_m[q_m(p)] - c_m q_m(p)}^{\text{per-firm (normalized)}}]}{\mathrm{d}p} = (p - c_m)q'_m(p)$$

# Additional Assumption

Assumption (**Increasing Ratio Condition**; IRC)

$$z_m(p) \text{ is increasing.}$$

- Ensures concavity of $W(r)$
- Holds for a large class of demand functions



# Sufficient Conditions for PD to Raise or Lower SW

Proposition 4

*Suppose the IRC holds.*

*(i) If*

$$\theta_w^* \mu_w^* \rho_w^* > \theta_s^* \mu_s^* \rho_s^*$$

*holds, then price discrimination raises social welfare.*

*(ii) If*

$$\frac{\overline{\theta}_w \overline{\mu}_w \overline{\rho}_w}{\overline{\theta}_s \overline{\mu}_s \overline{\rho}_s} \leq \frac{\pi_w''(\overline{p})}{\pi_s''(\overline{p})}$$

*holds, then price discrimination lowers social welfare.*

# Relation to the Sufficient Statistics Approach

- "Sufficient statistics" (Chetty 2009) are:

  (i) Conduct parameter, $\theta_m$

  (ii) Markup, $\mu_m$

  (iii) Pass-through, $\rho_m$

  (iv) $\pi''_m$

# (i) Conduct Parameter: Intensity of Competition

- **Conduct Parameter** in market $m$ is defined by:

$$\theta_m(p) \equiv 1 - A_m(p),$$

where $A_m(p)$ is the **aggregate diversion ratio** in market $m$, defined by:

$$A_m(p) \equiv -\frac{\sum_k \partial q_{km}(p,p)/\partial p_A}{\partial q_{Am}(p,p)/\partial p_A} = (n-1)\frac{\varepsilon_m^{cross}(p)}{\varepsilon_m^{own}(p)}$$

- Instead, easier to interpret: $\theta_m(p) = \frac{\varepsilon_m^I(p)}{\varepsilon_m^{own}(p)}$, where $\varepsilon_m^I(p) \equiv -\frac{pq_m'(p)}{q_m(p)}$ is the **industry-level** price elasticity.

$\Rightarrow$ If $\varepsilon_m^{own} = \varepsilon_m^I$, **monopoly** or **full collusion** ($\theta_m = 1$).
If $\varepsilon_m^{own} \to \infty$, **perfect competition** ($\theta_m = 0$).

# (ii) Markup

- **Markup** in market $m$ is simply $\mu_m(p_m) \equiv p_m - c_m \geq 0$

# (iii) Pass-through

- **Pass-through** in market $m$:

$$\rho_m \equiv \frac{\partial p_m}{\partial c_m} \geq 0$$

- For $r = r^*$ (full price discrimination),

$$\rho_m^* = \frac{\partial x_{Am}/\partial p_A}{\pi_m''} = \frac{1}{2 - (\sigma_m^{\mathrm{I}})^*},$$

where $\sigma_m^{\mathrm{I}}(q) \equiv -qp''/p'$ is the **curvature of the inverse demand**.

- For $r < r^*$,

$$\rho_m[p_m(r)] = \frac{\partial x_{Am}/\partial p_A}{\pi_s'' + \pi_w''}.$$

# Quantity Pass-through

- With constant marginal costs, **quantity pass-through** in market $m$ under price discrimination is given by

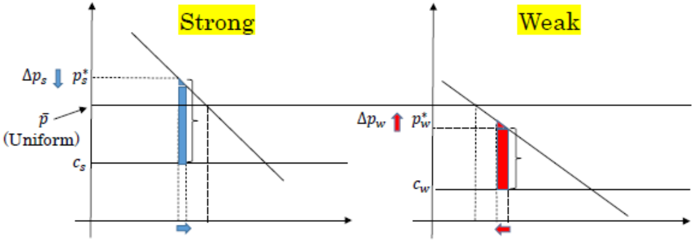
$$\begin{aligned}\frac{dq_m^*}{d\widetilde{q}} &= q_m'(p_m^*)\cdot\frac{dp_m^*}{d\widetilde{q}} = \frac{q_m'}{\frac{\partial x_{Am}}{\partial p_A}}\cdot\frac{\partial x_{Am}}{\partial p_A}\cdot\frac{dp_m^*}{d\widetilde{q}} \\ &= \left(\frac{q_m'}{\frac{\partial x_{Am}}{\partial p_A}}\right)\cdot\left(\frac{\frac{\partial x_{Am}}{\partial p_A}}{\pi_m''}\right) = \theta_m^*\cdot\rho_m^*,\end{aligned}$$

where $\widetilde{q}$ is an <u>exogenous amount of output</u> with

$$\pi_{jm}(p_{jm}, p_{-j,m}) = (p_{jm} - c_m)[x_{jm}(p_{jm}, p_{-j,m}) - \widetilde{q}].$$

# Intuition for Part (i) of the Proposition

$$z_m(p_m^*, c_m) = \underbrace{\mu_m^*}_{\text{Social surplus}} \times \underbrace{\theta_m^* \times \rho_m^*}_{\text{Quantity pass-through}}$$




$$\underbrace{\frac{1}{\pi_s''}(p_s^* - c_s)\cdot q_s'}_{\equiv \mu_s^*}$$

$$= \mu_s^* \cdot \left(\frac{q_s'}{\pi_s''}\right) = \mu_s^* \cdot \underbrace{\left(\frac{q_s'}{\frac{\partial q_{As}}{\partial p_A}}\right)}_{=\theta_s^*} \cdot \underbrace{\left(\frac{\frac{\partial q_{As}}{\partial p_A}}{\pi_s''}\right)}_{=\rho_s^*}$$

UP lowers social welfare!

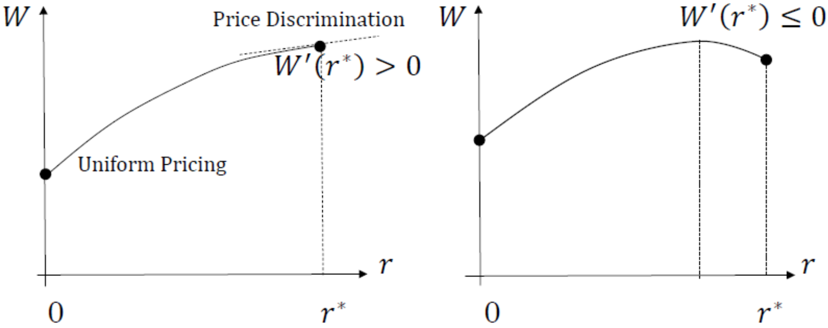
$$= \mu_s^* \cdot \theta_s^* \cdot \rho_s^* \quad < \quad \mu_w^* \cdot \theta_w^* \cdot \rho_w^*$$

# Caveat (1)

$$W'(r^*) > 0$$

$$\Downarrow \; \not\Uparrow$$

Price Discrimination Better than Uniform Pricing



# Caveat (2): for Part (ii) of the Proposition

- For $r < r^*$,

$$\frac{W'(r)}{2} = \underbrace{(-\pi_s''\pi_w'')}_{<0} \left( \frac{\theta_w(r)\mu_w(r)\rho_w(r)}{\pi_w''} - \frac{\theta_s(r)\mu_s(r)\rho_s(r)}{\pi_s''} \right).$$

  - Pass-through is no longer defined market-wise.
  - If $|\pi_m''|$ is small, then $\pi_m$ is "flat," and thus the price shift $|\Delta p_m|$ in response to some change would be large.
  - Hence, the role of $\pi_w''/\pi_s''$ is **to adjust measurement units** for $\rho_w/\rho_s$.
  - For example, if $|\pi_w''|$ is very small, then the $\rho_w$ is "over represented," and thus it should be "penalized."

# Sufficient Conditions for Output and Welfare Changes

- When all firms are **symmetric**,

(a) **Aggregate Output**

If $\theta_w^*\rho_w^* > \theta_s^*\rho_s^*$, then $Q^* > \overline{Q}$.
If $\overline{\theta}_w\overline{\rho}_w < \overline{\theta}_s\overline{\rho}_s\overline{\triangle}$, then $Q^* < \overline{Q}$.

(b) **Social Welfare**

If $\theta_w^*\mu_w^*\rho_w^* > \theta_s^*\mu_s^*\rho_s^*$, then $W^* > \overline{W}$.
If $\overline{\theta}_w\overline{\mu}_w\overline{\rho}_w < \overline{\theta}_s\overline{\mu}_s\overline{\rho}_s\overline{\triangle}$, then $W^* < \overline{W}$.

(c) **Consumer Surplus**

If $\mu_w^*\rho_w^* > \mu_s^*\rho_s^*$, then $CS^* > \overline{CS}$.
If $\overline{\mu}_w\overline{\rho}_w < \overline{\mu}_s\overline{\rho}_s\overline{\triangle}$, then $CS^* < \overline{CS}$.

$*$: Price Discrimination
$-$: Uniform Pricing

# Readily Carried Over to Firm Heterogeneity:

(a) **Aggregate Output**

If $[\boldsymbol{\theta}_w^*]^{\mathrm{T}}\boldsymbol{\rho}_w^* > [\boldsymbol{\theta}_s^*]^{\mathrm{T}}\boldsymbol{\rho}_s^*$, then $Q^* > \overline{Q}$.
If $[\overline{\boldsymbol{\theta}}_w]^{\mathrm{T}}\overline{\boldsymbol{\rho}}_w < [\overline{\boldsymbol{\theta}}_s]^{\mathrm{T}}\overline{\boldsymbol{\rho}}_s\overline{\boldsymbol{\Delta}}$, then $Q^* < \overline{Q}$.

(b) **Social Welfare**

If $[[\boldsymbol{\theta}_w^*]^{\mathrm{T}} \circ [\boldsymbol{\mu}_w^*]^{\mathrm{T}}]\boldsymbol{\rho}_w^* > [[\boldsymbol{\theta}_s^*]^{\mathrm{T}} \circ [\boldsymbol{\mu}_s^*]^{\mathrm{T}}]\boldsymbol{\rho}_s^*$, then $W^* > \overline{W}$.
If $[[\overline{\boldsymbol{\theta}}_w]^{\mathrm{T}} \circ [\overline{\boldsymbol{\mu}}_w]^{\mathrm{T}}]\overline{\boldsymbol{\rho}}_w < [[\overline{\boldsymbol{\theta}}_s]^{\mathrm{T}} \circ [\overline{\boldsymbol{\mu}}_s]^{\mathrm{T}}]\overline{\boldsymbol{\rho}}_s\overline{\boldsymbol{\Delta}}$, then $W^* < \overline{W}$.

(c) **Consumer Surplus**

If $[\boldsymbol{\mu}_w^*]^{\mathrm{T}}\boldsymbol{\rho}_w^* > [\boldsymbol{\mu}_s^*]^{\mathrm{T}}\boldsymbol{\rho}_s^*$, then $CS^* > \overline{CS}$.
If $[\overline{\boldsymbol{\mu}}_w]^{\mathrm{T}}\overline{\boldsymbol{\rho}}_w < [\overline{\boldsymbol{\mu}}_s]^{\mathrm{T}}\overline{\boldsymbol{\rho}}_s\overline{\boldsymbol{\Delta}}$, then $CS^* < \overline{CS}$.

# Introducing Non-constant Marginal Costs

- Note that our results so far do not crucially depend on the assumption of constant marginal cost.
- Caveat 1: Pass-through is now defined by

$$\rho_m \equiv \frac{\partial p_m}{\partial t_m},$$

where the first-order condition is replaced by

$$\partial_p \pi_m(p) = q_m(p) + (p - t_m - mc_m[q_m(p)]) \frac{\partial x_{A,m}}{\partial p_A}(p, p).$$

# Introducing Non-constant Marginal Costs (cont'd)

- Caveat 2: $\theta^*_m \rho^*_m$ is no longer interpreted as quantity pass-through under price discrimination.
  - "Elasticity of the marginal cost" should be taken into account.

# (Some) Empirical Studies

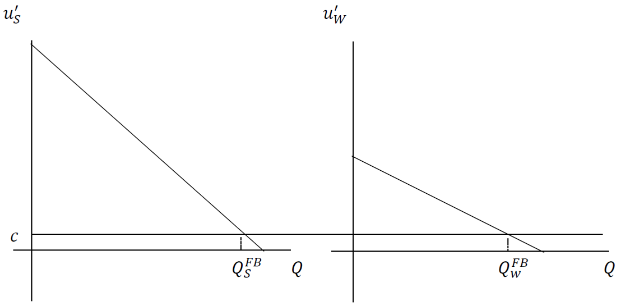
- Leslie (2004, *RAND*): Broadway theatre
- Asplund, Eriksson and Strand (2008, *JIndE*): Swedish newspaper industry
- Hendel and Nevo (2013, *AER*): Third-degree/intertemporal price discrimination in soda sale
- Boik (2017, *Canadian J Econ*): Arbitrage
- Aryal, Murry, and Williams (2023, *REStud*): International airline markets

# 3. Future

# Nonlinear Pricing under Imperfect Competition

- Strong type's (with mass of $\mu \in (0,1)$) and Weak type's utility: $u_s(Q)$, $u_w(Q)$
- $u_s(Q) > u_w(Q)$ for any $Q \geq 0$
- w "nested" by s: $u_s'(Q) > u_w'(Q)$ for any $Q \geq 0$

**Strong Type** **Weak Type**



# The Case of Monopoly (Maskin and Riley 1984, *RAND*)

- Menu pricing: $\{(T_s, Q_s), (T_w, Q_w)\}$
- Strong type:

$$\begin{cases} u_s(Q_s) \geq T_s & \text{(Participation)} \\ u_s(Q_s) - T_s \geq u_s(Q_w) - T_w & \text{(Self Selection)} \end{cases}$$

$$\rightarrow \quad T_s = u_s(Q_s) - u_s(Q_w) + T_w$$

- Weak type:

$$\begin{cases} u_w(Q_w) \geq T_w & \text{(Participation)} \\ u_w(Q_w) - T_w \geq u_w(Q_s) - T_s & \text{(Self Selection)} \end{cases}$$

$$\rightarrow \quad T_w = u_w(Q_w)$$

(No surplus is left for the weak type)

# Generalization by the Conduct Parameter Approach

$$T_w = u_w(Q_w) \quad \rightarrow \quad T_w = \theta u_w(Q_w) + (1-\theta)cQ_w$$

- Representative firm's profit:

$$\begin{aligned}\pi &= (1-\mu)\{\underbrace{\theta u_w(Q_w) + (1-\theta)c \cdot Q_w}_{\text{Tafiff for the Weak type}} - c \cdot Q_w\} \\ &\quad + \mu\{\underbrace{u_s(Q_s) - u_s(Q_w) + \theta u_w(Q_w) + (1-\theta)c \cdot Q_w}_{\text{Tariff for the Strong type}} - c \cdot Q_s\}\end{aligned}$$

$\Longrightarrow$

$$\frac{\partial \pi}{\partial Q_s} = 0$$

$$\Leftrightarrow u_s'(Q_s) = c$$

# A Price-Theoretic Perspective on **Nonlinear** Pricing

$$\frac{\partial \pi}{\partial Q_w} = 0$$

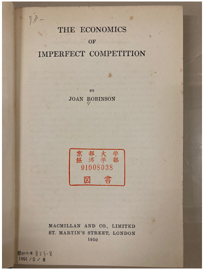
$$\Leftrightarrow u_w'(Q_w) = c + \underbrace{\frac{\mu}{1-\mu}\left\{\frac{1}{\theta}u_s'(Q_w) - u_w'(Q_w)\right\} - \frac{\mu}{1-\mu}\frac{1-\theta}{\theta}c}_{\equiv K(\theta)}$$

- Then,

$$\frac{\partial K}{\partial \theta} = -\frac{\mu}{(1-\mu)\theta^2}\{\underbrace{u_s'(Q_w) - c}_{>0}\} < 0$$

$\rightarrow$ Empirical prediction:
"As competition intensifies ($\theta \searrow$), weak type's consumption is **reduced** ($Q_w \searrow$)."
(but, not straightfoward; recall the good old days like the SCP paradigm...)

- "[I]f there is some degree of **market imperfection** there can be some degree of **price discrimination**." (p. 180)

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