The Curse of Education

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Outline:

1. Protective competition
2. Non-protective competition: The Curse of Education
3. Example: Shrouded Attributes
4. Example: Noise

1 Competition is sometimes protective

Furthermore, manufacturers in a competitive equipment market have incentives to avoid even [the] inefficiency [caused by high markups on aftermarket goods] by providing information to consumers. A manufacturer could capture profits by raising its [base-good] prices above market levels (i.e., closer to cost), lowering its aftermarket prices below market levels (i.e., closer to cost), and informing buyers that its overall systems price is at or below market. In this fashion, the manufacturer could eliminate some or all of the deadweight loss, attract consumers by offering a lower total cost of ownership, and still capture as profits some of the eliminated deadweight loss. In other words, and unlike traditional monopoly power, the manufacturers have a direct incentive to eliminate even the small inefficiency caused by poor consumer information (Shapiro 1995, p. 495).

2 Competition need not be protective

- Firms do not have an incentive to educate or debias consumers if debiased consumers are not profitable

- "Curse of education": educating the consumer makes her unprofitable.

Examples of education that will make a consumer unprofitable:

- "financial markets are nearly efficient"
- "echinacea does not reduce symptoms of the common cold"
- "bottled water is no better than tap water"
- "hotels make their money on the extras"
- "printer ink is expensive"

The Curse of Education: Three Types of Profit-Lowering Education

1. commodification effect

- water

2. devaluation effect

- echinacea, active management, water

3. cost salience effect

- hotels, printers

3 Shrouded attributes

Gabaix and Laibson (QJE, 1996)

- Many goods have "shrouded attributes" that some people don't anticipate when deciding on a purchase.

- Consider buying a printer
  - Some consumers only look at printer prices.
  - They don't look up the cost of cartridges.

- Add-ons will be shrouded and will have large mark-ups.
  - Even in competitive markets.
  - Even when demand is price-elastic.
  - Even when firm could freely unshroud the add-on...

3.1 Shrouded attributes

- Mortgage fees, including closing costs (Woodward 2003).

- Credit card fees and long-term interest rates (Ausubel 1990, Agarwal et al 2006).

- Mutual fund fees: Most individual investors report that they do not know the fees that they are paying (Alexander et al. 1998, Barber et al. 2002).

- Printer cartridges: only 3% of printer buyers report that they knew the ink price per page when they bought their printer (Hall 2003).

- Hotels (phone fees), banking (minimum balance fees), video stores (late fees) (Ayres and Nalebuff 2003, Ellison 2005).

3.2 Bank Illustration

- Assume consumers do not foresee add-ons & firms have no market power.
- Basic bank account costs $40 for US Trust to provide.
- Add-on services cost $0 to provide.
- Add-on services can be priced to generate fees of $90 from naive consumers.
- Add-on services are avoided by sophisticates.

Equilibrium:

- Free gift for opening an account: \$50.
- Add-on services are priced to generate fees of \$90.
- Naive consumers pay:

$$-\$50 + \$90 = \$40.$$

- Firms break even (0-profit condition):

$$-\$50 - \$40 + \$90 = 0.$$

- Sophisticates get a cross-subsidy.

Is consumer education profitable?

What would happen if a competitor with **no** markups tried to educate consumers?

Call the new firm: Transparency Bank

- "US Trust is charging you $90 for add-ons!"

- "Transparency Bank charges nothing for add-ons and a $40 annual fee for holding an account with us."

Would newly minted sophisticates choose Transparency Bank?

- New sophisticates would be savvy to US Trust's game plan.
- They would avoid many of the markups at US Trust.
- Surplus from switching away from US Trust: spend $40 on the annual fee and save little on the add-ons, since you are now avoiding them anyway.
- Sophisticates won't switch. Better to stay at US Trust, get the loss leader pricing, and avoid the add-ons.
- Making consumers educated hurts US Trust and does not attract consumers to Transparency Bank.

- Sophisticated consumers would rather pool with myopic consumers at **high** mark-up firms, then defect to low mark-up firms.

- At high mark-up firms, sophisticated consumers reap all of the benefits of loss leader base goods and avoid some of the costs of high mark-up add-ons.

  – "It's good to stay at a hotel with an expensive spa, as long as you don't use it."

  – Sophisticates benefit from "free gifts" and avoid high fees.

- So advertising will make consumers sophisticated, but may **not** attract them to low mark-up firms.

3.3 Conclusions for Shrouded Attributes

- Firms set monopoly prices for add-ons.
- Add-ons are profits centers.
- Base product may be a loss leader.
- Firms shroud add-on prices.
- Firms do not educate the consumer

- The lack of education is a cost-salience effect: making costs salient makes consumers unprofitable, even for the new entrant.

- Curse of education: educated consumers prefer to go to firms that attract uneducated consumers because of a cross-subsidy.

- Solution I: public consumer education (look for add-on costs)

- Solution II: regulated transparency (make add-on costs salient)

4 Noise

- Gabaix, Laibson, and Li (2005)

- Consumers observe

$$(u_i - p_i) + \varepsilon_i,$$

  where $\varepsilon \sim \sigma f(\varepsilon)$.

- Consumers pick good with highest perceived value

$$i = \arg\max_i \{(u_i - p_i) + \varepsilon_i\}$$

- **Proposition** (Perloff-Salop '85): For identical firms

$$p - c = \frac{\sigma}{n\left(n-1\right)\int f\left(\varepsilon_i\right)^2 F\left(\varepsilon_i\right)^{n-2} d\varepsilon_i}$$

- **Proposition** (Caplin-Nalebuff '91): Equilibrium exists if $\ln f$ concave.

- **Proposition** (Gabaix, Laibson and Li '05):

$$p - c \sim \frac{\sigma}{nf\left(A_n\right)\Gamma\left(2+\xi\right)}$$

$A_n = F^{-1}\left(1 - 1/n\right)$ and $\xi = \lim_{x \to F^{-1}(1)} \left(\overline{F}/f\right)'(x)$.

- **Proposition**: For $u_i - p_i$ bounded, and f in the domain of the logit:

$$\begin{aligned} D_i &\sim \frac{\exp\left(\beta\left(u_i - p_i\right)\right)}{\sum_{j=1}^{n} \exp\left(\beta\left(u_j - p_j\right)\right)} \\ \beta &= \frac{1}{B_n \sigma} \end{aligned}$$

4.1 Does competition eliminate markups quickly?

- Uniform noise (or Cournot competition):

$$p - c \sim 1/n$$

- Exponential, logit:

$$p - c \sim 1$$

- Which intuition applies in general?

- Bounded power law noise: $f(\varepsilon) = k(1-\varepsilon)^{\alpha-1}$, $\varepsilon \in [-1,1], \alpha \geq 1$

$$p - c \sim n^{-1/\alpha}$$

- Gaussian noise

$$p - c \sim \frac{1}{\sqrt{\ln n}}\sigma$$

- Exponential noise, $f(\varepsilon) = e^{-\varepsilon+1}1_{\varepsilon>-1}$,

$$p - c = \sigma$$

- Log normal noise:

$$p - c \sim e^{\sqrt{2\ln n}}\sigma$$

So $p - c$ is not sensitive to n. Competition/entry doesn't change markups.

Mark-ups as a function of the number of competitors, n, with Gaussian noise and with uniform noise (or Cournot).

n	Gaussian noise	Uniform noise
10	1.00	1.00
100	0.61	0.1
$1,000$	0.48	0.01
$10,000$	0.40	0.001
$100,000$	0.35	0.0001
$1,000,000$	0.32	0.00001

4.2 Conclusions about Noise:

- Can firms exploit consumer confusion? $Yes.\ \ p - c \propto \sigma$
- Will competition decrease mark-ups? $Barely.\ \ p - c \sim \frac{1}{\sqrt{\ln n}}$
- How do firms maximize profit? $Raise\ complexity.$
- Will greater competition force firms to reduce complexity? $No.\ Complexity\ endogenously\ rises.$

- The lack of equilibrium education is a commodification effect: reducing noise makes consumers less profitable.

- With lower noise, goods become more like commodities.

- Solution: regulated transparency.

6 Some open questions in Behavioral IO

- We need more empirical field work.
- We need to be able to predict and measure the degree of consumer confusion.
- We need to understand whether markets for advice — e.g. financial advice — offset consumer confusion.
- Are regulations the solution or do they just generate problems of their own?