Loss Leading as an Exploitative Practice

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Below-cost pricing

Retailing markets

- Growing power of large retailers causes antitrust concerns
  - large literature on buyer power and its impact on suppliers (and rivals)
  - less attention to impact of seller power on consumers / smaller rivals

- Loss leading: pricing selected products below cost
  - widely used marketing practice
    - see e.g. UK Competition Commission (2008)
    - adopted by 90% of large retailers
    - about 6% of total sales

- leader products
  - staples such as milk, bread, wine, ...
  - focus on Known-Value-Items

- rarely adopted by small retailers
More generally

- Asymmetric product ranges
  - platform / applications
  - equipment / accessories, spare parts, maintenance services

- Heterogenous "shopping costs" (adoption, learning, ...)

- Below-cost pricing / bundling of selected applications / accessories
  - browser / player integrated in the OS
  - maintenance / insurance included in the equipment package
Theory and practice

- Existing theory
  - advertising strategy (Lal and Matutes 1994, Ellison 2005)
  - cross-subsidizing by a multi-product monopolist (Bliss 1988)

- Ignores often-voiced antitrust concerns
  - smaller rivals’ profits are squeezed
    - retailing: Competition Commission 2008
    - platform/applications: Microsoft
  - consumers face higher prices on other items (Dobson 2000)
Case law

- **American Drugs vs. Wal-Mart in Arkansas (1993)**
  - Wal-Mart lost the initial trial in state court
  - but won on appeal in Supreme Court of Arkansas:
    "loss leading is readily justifiable as a tool to foster competition rather than to eliminate rivals"

  - order to stop selling below cost staples such as milk and butter
  - concern that this may drive smaller retailers out of the market

- **Rules on below-cost resale**
  - US: banned in 22 states, allowed in other states
  - EU: banned in 6 countries, restricted in 7, OK in Netherlands and UK

- **Microsoft: US vs EU**
What type of abuse?

- Competition authorities tend to treat loss leading as predatory pricing … but loss leading involves persistent below-cost pricing
  - unlikely to establish recoupment and other conditions for predation
  - driving the rival out is generally implausible
  - UK Competition Commission (2008): "below-cost selling by large grocery retailers does not represent predatory behavior"

- Microsoft saga
  - bundling / giving "for free" brower, player, ...
  - structural pricing policy rather than short-term price war

- Here: no predation (exclusionary motive) but an exploitative device
  - allows large firms to extract additional surplus from consumers
    - discriminates multi-stop shoppers from one-stop shoppers
    - hurts smaller rivals as a by-product
  - banning below-cost benefits consumers, smaller rivals and society
Framework

- Two firms, $L$ and $S$
- $L$ offers a broader range than $S$
- Two segments (products, varieties of a product, ...): $A$ and $B$
  - $A$ is monopolized by $L$
  - $B$ is competitive: offered by both $L$ and $S$
- Marginal costs: $c_A$ for $A$, $c_L$ for $B_L$, and $c_S < c_L$ for $B_S$
Demand

- Each consumer willing to buy one unit of $A$ and $B$
- Homogenous valuations: $u_A$ for $A$, $u_B$ for $B$
  \[ \rightarrow \text{eliminates cross-subsidization motive based on different elasticities} \]
- Complete information
  \[ \rightarrow \text{no role for (informative) advertising} \]
- Heterogeneous shopping cost $t$: c.d.f. $F(\cdot)$, density $f(\cdot)$
Comparative advantage

- Total surplus from bundle $A - B_L$: $w_{AL} \equiv u_A + u_B - c_A - c_L$

- Total surplus from $B_S$: $w_S \equiv u_B - c_S$

- $L$ enjoys a comparative advantage if $w_{AL} \geq w_S$
  
  - value of $L$’s broader assortment exceeds $S$’s cost advantage
  
  - amounts to $w_A \equiv u_A - c_A \geq \Delta_B \equiv c_L - c_S$
1. \( L \) and \( S \) simultaneously set prices: \((p_A, p_L)\) and \(p_S\)

   [(mixed) bundling cannot do better]

2. Consumers observe prices and choose on the basis of
   - assortment
   - prices
   - shopping cost
Benchmark: monopoly

- Consumers buy $A$ and $B$ from $L$ if
  \[ t \leq v_{AL} \equiv u_A + u_B - p_A - p_L = w_{AL} - r_{AL}, \]
  where $r_{AL}$ is the total margin for the bundle $A - B_L$

- Profit $r_{AL} F(v_{AL}) = r_{AL} F(w_{AL} - r_{AL})$

- Monopoly margin and value: $r_{AL}^m = h(v_{AL}^m) = h(w_{AL} - r_{AL}^m)$, where $h(\cdot) \equiv F(\cdot)/f(\cdot)$ denotes the inverse hazard rate
Asymmetric competition

- Consumers choose between one-stop and multi-stop shopping
  - suppose one-stop shoppers favor $L$
  - they are willing to patronize $L$ if $t \leq v_{AL}$
  - but prefer multi-stop shopping if $t \leq \tau \equiv p_L - p_S$
  - therefore, $F(v_{AL})$ buy $A$, and $F(v_{AL}) - F(\tau)$ buy also $B$ from $L$

\[ \begin{array}{cccc}
0 & & & S \\
\text{Multi-stop shoppers} & & & \text{One-stop shoppers} \\
\text{From} & L & \text{From} & S \\
\text{And} & \emptyset & \text{From} & L \\
\end{array} \]
Below-cost pricing as an exploitative device

- Suppose a competitive fringe of small rivals: \( p_S = c_S \)

\[
\Pi_L = r_{AL} (F(v_{AL}) - F(\tau)) + r_A F(\tau)
\]
\[
= r_{AL} F(v_{AL}) - r_L F(\tau)
\]
\[
= r_{AL} F(w_{AL} - r_{AL}) - r_L F(c_L - c_S + r_L)
\]

- This profit is separable in \( r_{AL} \) and \( r_L \)

  - \( L \) still wants to charge monopoly margin \( r_{AL}^m \) for bundle \( A - B_L \)
  - but prices \( B_L \) below cost

\[
r_L^* = -h(\tau^*) < 0
\]
Below-cost pricing as an exploitative device

- Below-cost pricing arises whenever $w_{AL} > w_S$
  - one-stop shoppers favor $L$ whenever it has a comparative advantage

- If $\nu^m_{AL} > w_S$, $r^*_{AL} = r^m_{AL}$ for one-stop shoppers
  - price above monopoly level for multi-stop shoppers: $r^*_{A} > r^m_{AL}$
  - $L$ obtains more than monopoly profit: $\Pi^*_L \equiv \Pi^m + F(\tau^*)h(\tau^*)$
  - extra profit comes from multi-stop shoppers
    \[-r^*_LF(\tau) = (r^*_{A} - r^m_{AL})F(\tau)\]

- If $w_{AL} > w_S > \nu^m_{AL}$, cap on $r_A$, $r_{AL}$ but still $r^*_L = -h(\tau^*) < 0$

- Otherwise, $L$ monopolizes $A$ and leaves $B$ to its rivals
Margin squeeze

- Suppose $S$ is a strategic rival

$$\Pi_S = r_S F(\tau) = r_S F(\Delta_B + r_L - r_S)$$

- optimal margin is such that $r_S^* = -r_L^* = h(\tau^*)$

- threshold $\tau^*$ (one-stop / multi-stop) determined by

$$\tau^* = \Delta_B + r_L^* - r_S^* = \Delta_B - 2h(\tau^*)$$

- Below-cost pricing arises when $L$ has large enough comp. advantage

  - $w_{AL} > \hat{w}_{AL}(w_S, w_L)$, where $\hat{w}_{AL}(w_S, w_L) > w_S$, increases with $w_S$

  - in that case, $r_{AL}^* = r_{AL}^m$ and again $\Pi_L^* = \Pi_L^m + F(\tau^*)h(\tau^*) > \Pi_L^m$
Banning below-cost pricing

- Banning below-cost pricing hurts $L$
  - constrains $L$ to set $r_L = 0$: it thus earns $r_{AL} F(w_{AL} - r_{AL})$
  - $L$ then charges monopoly margin $r_{AL}^m$ and obtains $\Pi_{AL}^m$

- The ban increases consumer surplus and total welfare
  - no impact on one-stop shoppers
  - multi-stop shoppers benefit from decrease in $r_A$ (increase in $r_S$)
  - improved efficiency in distribution: $S$ serves more consumers

- If $S$ responds (strategic rival)
  - price and profit of $S$ both increase
  - impact on consumers and efficiency remains positive
Recap

- Pricing below cost the product that is also offered by smaller rivals
  - allows the large firm to charge more on the other goods
  - keeping unchanged the overall price for one-stop shoppers
    → one-stop shoppers are not affected
    → but the large firm extracts more surplus from multi-stop shoppers

- Below-cost pricing arises in equilibrium whenever
  - the additional value from the large firm’s broader product range
  - more than compensates the efficiency advantage of the smaller rivals

- This strategy increases the profit of the large firm
  (who can earn even more than in the absence of the smaller rivals)
  ... at the cost of
  - lower consumer surplus,
  - lower market share and profit for the smaller (more efficient) rivals
  - and thus lower social welfare.

- A ban on below-cost pricing would be welfare improving
Strategic margin squeeze

- $L$ acting as Stackelberg leader
  - prices are strategic complements
  - usually induces leader to increase its price
  - here, leads instead $L$ to offer a larger discount

- Uncertain entry of $S$
  - below-cost pricing generates inefficient deterrence
  - hurts $L$, who relies on $S$ to exploit consumers
  - leads $L$ to reduce the discount offered on $B$
Robustness

- Readily extends to
  - differentiation on $B$ segment: $u_L \neq u_S$ ($u_S - c_S > u_L - c_L$)
  - partial substitution between $A$ and $B$: $u_{AB} < u_A + u_B$
  - complementarity between $A$ and $B$: $u_{AB} > u_A + u_B$ – e.g., $u_B = 0$
  - asymmetric shopping costs: $t$ for $S$, $\alpha t$ for $L$
  - elastic demand for $B$ (pricing below cost expands demand)

- Next
  - elastic demand for $A$ ($L$ faces a trade-off when raising $r_A$)
  - imperfect competition on $A$ (idem)
  - "symmetric asymmetry": $L_1$ better on $A$, $L_2$ better on $B"
Two large firms $L_1$ and $L_2$, hotelling differentiation on $A$

- consumer $x$ obtains
  - $u_A - \frac{x}{\sigma} - p_{A_1} = w_A - r_{A_1} - \frac{x}{\sigma}$ from buying $A_1$
  - $w_A - r_{A_2} - \frac{1-x}{\sigma}$ from buying $A_2$

- $x$ distributed over $[0, 1]$ according to c.d.f. $G(\cdot)$, density $g(\cdot)$
  - Symmetry: $g(x) = g(1-x)$
  - Inverse hazard rate $k(x) \equiv G(x)/g(x)$ increases with $x$
Elastic demand for monopolized segment

- Local monopolies if $\sigma$ low enough (elastic demand for $A$)
  - $L$ competes with $S$ for multi-stop shoppers
  - $L$ also competes with $S$ for one-stop shoppers

$\rightarrow$ in any equilibrium in which it attracts some one-stop shoppers, the large firm prices $B$ below cost

- intuition: consumers with low shopping costs have less elastic demand
Imperfect competition among large firms

- Hotelling duopolies
  - $L_1$ competes with $L_2$ (and $S$) for multi-stop shoppers
  - $L_1$ competes with either $L_2$ or $S$ for one-stop shoppers

→ large firms price $B$ below cost
- Same applies if distribution of shopping costs is bounded
Symmetric asymmetry

- Two multiproduct firms $L_1$ and $L_2$
  - compete on both $A$ and $B$
  - $L_1$ better on $A$, $L_2$ better on $B$

- In equilibrium
  - one-stop shoppers distribute themselves between $L_1$ and $L_2$
  - multi-stop shoppers buy $A$ from $L_1$ and $B$ from $L_2$
  - both firms sell their weak product below cost
Competition versus acquisition

- No benefit from opening a new outlet when facing a competitive fringe

- But can be profitable for markets in which
  - $L$ initially enjoys monopoly
    - $L$ then charges $r_{AL} = r_{AL}^m$ and $r_L - r_S = -h(\tau^*)$
    - in this way obtains $\Pi^*_L = \Pi_{AL}^m + h(\tau^*) F(\tau^*)$
  - $L$ faces strategic smaller rivals: opening another outlet
    - fosters competition in $B$
    - which may help discriminate further multi-stop shoppers

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Concluding Remarks

- Insights
  - below-cost pricing can arise absent any efficiency justification
    - harms consumers, smaller rivals and society
    - pretty robust when switching costs are heterogeneous
  - below-cost pricing as an exploitative device rather than an exclusionary tool
    - sheds a light on cases
    - Article 102 (abuse of dominance) versus Section 2 (monopolization)
  - below-cost pricing in other contexts of asymmetric competition
    - platform / applications
    - equipment / accessories, spare parts, maintenance services

- Limitations / further research
  - variable individual demands
  - interdependence consumers’ willingness to pay / shopping costs
  - hard-discounters vs convenience stores