Overview of ECO410H and Introduction to Horizontal Merger Assessment

Class 1

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ECO410H1F

- "Mergers and Competition Policy"
- Prof. Murdock
- Syllabus
  - Take a moment to skim through section titles
  - Highlight some important points
  - Take questions

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Organizing Questions for Today

- Which field of economics contains our course?
- What is market power?
  - Is market power affected by demand conditions? Market structure?
  - Is market power bad (from a policy perspective)?
  - Does high market power mean there is insufficient competition in a market?
- What are horizontal mergers? Why are there antitrust laws regarding which are legal?

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IO: Industrial Organization

- <u>IO:</u> Study firm behavior, market structure, consumers and producer welfare, efficiency
  - Often studies oligopoly: few firms, strategic
    - In contrast, two simple models of firm behavior: perfect competition (p=mc) & monopoly (p>mc)
  - IO is a field within applied microeconomics
    - Theory and econometrics applied to institutional facts
    - <u>Theoretical IO:</u> Derive predictions using microeconomic theory and a set of plausible assumptions
    - <u>Empirical IO:</u> Estimate model parameters using data

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Firm Behavior and Market Power

- Assume firms make choices to maximize profit
  - $mr = mc$
  - Assume firm knows demand and its costs
  - Choice variables: price, quantity, product characteristics, …

- <u>Lerner Index:</u> Measures a firm's market power: fraction of the price that is pure mark-up over marginal costs (aka "gross margin")
  - $Lerner\ Index = \frac{p-mc}{p}$
  - How interpret a Lerner Index of 0.2?
    - 0.5?

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Monopoly

- <u>Monopoly:</u> It's product has no *close* substitutes
  - How to measure closeness? Recall cross-elasticity of substitution: $\varepsilon_{12} = \frac{\%\,\Delta Q_1}{\%\,\Delta P_2} = \frac{\frac{\partial Q_1}{Q_1}}{\frac{\partial P_2}{P_2}} = \frac{\partial Q_1}{\partial P_2}\frac{P_2}{Q_1}$
  - Leads to question of what is a market
  - Monopolist faces a downward sloping demand (not horizontal demand like a (perfectly) competitive firm)
  - Consider a simple *static model* of monopoly: chooses price *or* quantity (equivalent)

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Monopolist: Profit Maximization

- $\pi = TR - TC$
- $\pi = p(Q)Q - C(Q)$
- $\frac{\partial \pi}{\partial Q} = \frac{\partial p(Q)}{\partial Q}Q + p(Q) - \frac{\partial C(Q)}{\partial Q} \stackrel{set}{=} 0$
- $\frac{\partial p(Q)}{\partial Q}Q + p(Q) = mc$
- $mr = mc$

Monopolist: Market Power

- $\pi = p(Q)Q - C(Q)$
- $\frac{\partial \pi}{\partial Q} = \frac{\partial p(Q)}{\partial Q}Q + p(Q) - \frac{\partial C(Q)}{\partial Q} \stackrel{set}{=} 0$
- $\frac{\partial p(Q)}{\partial Q}Q + p(Q) = mc$
- $-\frac{1}{\frac{\partial Q}{\partial p(Q)} * \frac{p(Q)}{Q}}p(Q) = p(Q) - mc$
- $\frac{p(Q)-mc}{p(Q)} = -\frac{1}{\varepsilon}$ In general, is this true?
  In general, does mc depend on Q?
  In general, does ε depend on Q?

From General to Specific Models

- Add some specific *functional form* assumptions for demand and costs
  - Linear demand; Constant elasticity demand
  - Constant marginal costs, with or without fixed costs
    - $C(Q) = F + cQ$
    - How would this differ if marginal costs were not constant?
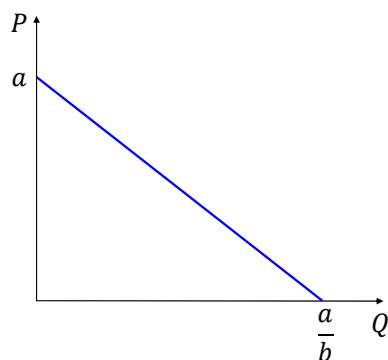- Graphical and non-graphical solutions

Linear Demand

- Inverse demand:
  $$P = a - bQ$$
  - Ordinary demand:
  $Q = a/b - P/b$
  - Choke price: Maximum any consumer WTP
    - Marginal consumer? Inframarginal consumer?
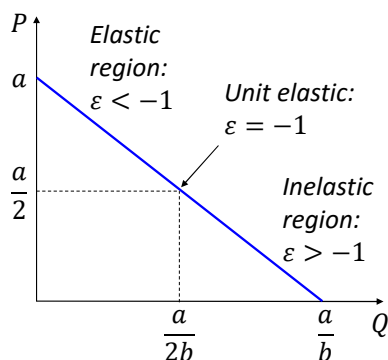 - How does demand change with parameter values?

Elasticity of Linear Demand

- Demand elasticity:
  $$\varepsilon = \frac{\% \, \Delta Q}{\% \, \Delta P} = \frac{\frac{\partial Q}{Q}}{\frac{\partial P}{p}} = \frac{\partial Q}{\partial P} \frac{P}{Q}$$

- For linear demand where $Q = a/b - P/b$:
  $$\varepsilon = \frac{\partial Q}{\partial P} \frac{P}{Q} =$$
  $$-\frac{1}{b} \frac{P}{a/b - P/b} = -\frac{P}{a - P}$$

Elastic region: $\varepsilon < -1$

Unit elastic: $\varepsilon = -1$

Inelastic region: $\varepsilon > -1$

Elasticity of Log-Linear Demand

- Log-linear demand:
  $\ln(Q) = a - b\ln(P)$
- Can rewrite as:
  $Q = e^a P^{-b}$

- $\varepsilon = \frac{\partial Q}{\partial P} \frac{P}{Q} =$
  $-be^a P^{-b-1} \frac{P}{e^a P^{-b}} =$
  $-b$

- "Constant elasticity"
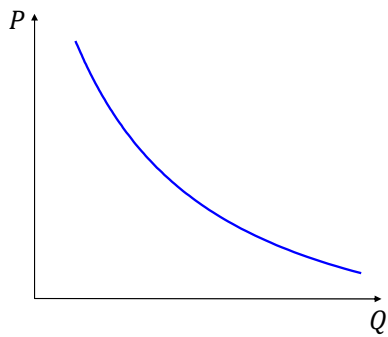
Examples

- Market demand: $\ln(Q) = 8 - 4\ln(P)$
  - Suppose a monopolist has constant $mc = 3$, what price would it set?
    - $\frac{P-3}{P} = \frac{1}{4} \rightarrow 4P - 12 = P \rightarrow P = 4$
  - How much market power would monopolist have?
- $\ln(Q_i) = \phi + X_i\beta + \alpha\ln(P_i) + \varepsilon_i$
  - If estimate $\alpha = -2$, then what is Lerner Index for a monopolist?

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Questions to Review

- What if firm is not a monopolist? Is $Lerner\ Index = \frac{p(Q) - mc}{p(Q)} = -\frac{1}{\varepsilon}$ still true?
  - In perfect competition?
  - Would a non-monopolist have more or less market power, other things equal?
- Does high (low) market power mean high (low) profits? What else must be taken into account?

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Costs

- Variable (VC): Vary with output level of
- Fixed (FC): Do not vary with output level
- Sunk costs: Cannot be recovered
  - Not all FC's are sunk, but all sunk costs are FC's

- Total: $C(q) = FC + VC$
- Ave Variable; Ave Fixed:
  $AVC = VC/q$;
  $AFC = FC/q$
- Average (Average Total):
  $ATC = AC = C(q)/q$
  - Note: $C(q) = AC * q$
- Marginal: $mc = \frac{\partial C(q)}{\partial q}$

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Returns to Scale

- <u>Positive economies:</u> AC falls as Q rises
  - Also called increasing returns to scale (IRTS)
  - Common cause: large fixed costs
- <u>Constant returns:</u> AC constant as Q rises
  - If no fixed factors (long-term), firm could increase all factors to achieve CRTS
- <u>Diseconomies:</u> AC increases as Q rises
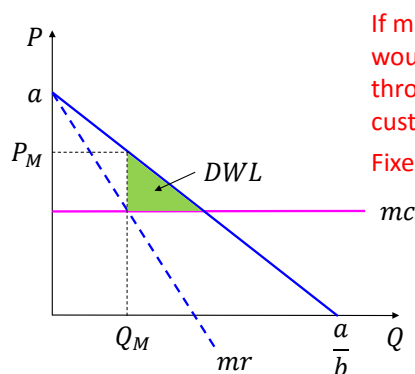 - Some fixed factor of production (short-term)

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Common Cost Specification

- Often assume this simple function form for costs: $C(q_i) = f_i + c_i q_i$

$$\$$$

AC

$mc = \text{AVC}$

AFC

q_i
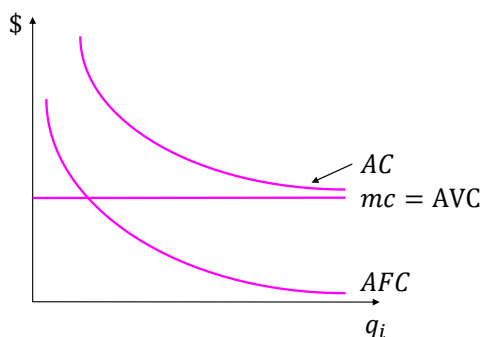
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CS, PS, TS (=CS+PS), Deadweight Loss

P

a

P_M

DWL

mc

Q_M

mr

$\dfrac{a}{b}$

Q

If marginal costs decreased, would monopolist pass through any savings to its customers (i.e. lower prices)?

Fixed cost savings?

Revisit organizing questions

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Elzinga and Mills (2011)

- Lerner Index: history, critiques, and relation to antitrust
  - A high Lerner Index – (Price – marginal cost)/Price – does *not* imply a lack of competition. Instead, a high Lerner Index may reflect the costs structure and/or intense competition. In markets where production technologies are characterized by high fixed costs (IRTS), high price-cost margins are necessary even for zero profits. Further, a firm may have a high Lerner Index because it achieved a marginal cost advantage over its competitors or because it has successfully differentiated its product making its own demand less elastic and permitting a higher mark-up. In fact, firms facing strong rivals have an incentive to seek cost advantages and to differentiate their products. Intense competition can cause a high Lerner Index.

Example of a *coherent* paragraph that *summarizes* Elzinga and Mills (2011) *without any direct quotes*. In other words, a *critical summary* that distills the arguments.

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Horizontal Mergers (HMs)

- <u>Horizontal merger</u>: Firms that (potentially) compete in one or more markets
  - HM may soften competition and reduce TS
    - Ideally, antitrust laws block "bad" HMs
- Consider U.S., Canada, E.U. competition policy
  - Implications for multinationals (ex. GE)
    - Recent ex: Anheuser-Busch InBev-SABMiller merger
      - http://www.nytimes.com/2016/05/25/business/dealbook/european-regulators-approve-anheuser-busch-inbev-sabmiller-merger.html
  - Major roles for economists: certainly for HMs

For a more sexy description, Episode 438: Mavericks, Monopolies And Beer, *Planet Money*

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Canadian Antitrust Law

- Competition Act (1986):
  - Reviewable matters: e.g. mergers, abuse of dominant position (conspiracies, bid rigging: criminal matters)
  - Creates Competition Tribunal
    - Special court: <u>reviewable offence</u> cases
    - Currently 3 judicial and 4 lay appointed members
    - http://www.ct-tc.gc.ca/
  - Competition Bureau is responsible for administration and enforcement of the Competition Act
    - Launch inquires; bring matters before Competition Tribunal

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U.S. Antitrust Law

- <u>Sherman Act, Section 1</u>: Makes illegal "every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade"
- <u>Sherman Act, Section 2</u>: Makes it a felony to "monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize" [a market]
- <u>Clayton Act, Section 7</u>: Makes illegal any acquisition where "the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly"
- <u>FTC Act, Section 5</u>: Makes illegal "unfair methods of competition in or affecting commerce"

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U.S. Antitrust Enforcers

- Department of Justice (DOJ) Antitrust Div.
  - Sues in Federal court
  - Obtains an <u>injunction</u> to stop a merger
  - http://www.justice.gov/atr/
- Federal Trade Commission (FTC)
  - 5 commissioners appointed by the President
  - Only FTC can enforce Section 5 of FTC Act
  - <u>Cease and desist</u> order to stop a merger
  - http://www.ftc.gov/bc/

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US: Premerger Notification HSR

- Hart-Scott-Rodino Antitrust Improvement Act of 1976
  - Merging parties must file w/ both DOJ & FTC
    - Exception: Minimum transaction size: $78.2 million
  - Filing fee is $45,000 - $280,000
  - Wait 30 days before they can consummate the merger
  - Means that agencies have to move quickly to decide if they should make a "second request"

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Laws Confusing / Ambiguous?

- Merger guidelines help:
  - U.S. *Horizontal Merger Guidelines* (August 2010)
  - Canadian *Merger Enforcement Guidelines* (October 2011)
  - EU *Guidelines on the assessment of horizontal mergers* (May 2004)
- These are <u>not</u> laws but meant to give firms a more concrete idea about what is legal

Categories of Harm from Merger

- <u>Coordinated effects:</u> Merger increases likelihood or value to firms of coordinating their actions (pricing, quantity, etc.)
  - Includes two different types of coordination:
    - Express collusion (criminal)
    - Tacit collusion, collective dominance (non-criminal)
- <u>Unilateral effects:</u> Merger increases firms' ability to exercise market power

Unilateral Effects

- "Tendency of a horizontal merger to lead to higher prices simply by virtue of the fact that the merger will eliminate direct competition between the two merging firms, even if all other firms in the market continue to compete independently"
  - Carl Shapiro, "Mergers with Differentiated Products", *Antitrust* (Spring 1996)

Rogers Acquires Fido

- In Nov. 2004 the Competition Bureau cleared the proposed acquisition of Fido (Microcell Telecommunications) by Rogers, "after carefully reviewing the merger's competitive effects on the mobile wireless industry"
  - Did it involve the Competition Tribunal?
  - http://www.competitionbureau.gc.ca/
    - English; Search; "Rogers and Fido"

Wireless Subscribers

- Each firm's annual report, pre-merger:
  - Rogers 2004: 5.6 million (35%)
  - Fido (Microcell) 2003: 1.2 million (8%)
  - Bell (BCE) 2004: 5.3 million (33%)
  - Telus 2004: 3.9 million (24%)

- Each firm's annual report, post-merger:
  - Rogers 2007: 7.0 million (37%)
  - Nov. 2004 Rogers acquires Fido
  - Bell (BCE) 2007: 6.2 million (33%)
  - Telus 2007: 5.6 million (30%)

Investigating Unilateral Effects

- Gather evidence from firms in industry:
  - Interviews
  - Review documents
  - Data (sales, surveys, etc.); normal course of business
- Build theory of harm
- Consider efficiencies and entry

Rogers/Fido Investigation: "The Bureau obtained valuable input from competitors, industry participants, consumers and independent experts. It also conducted a detailed financial review of Microcell's current business plan, as well as other corporate documents"

Rogers – Fido Conclusions

- Competition Bureau finds that the merger:
  - "is unlikely [to] create or enhance market power in the mobile wireless market"
  - "will not affect either the rapid rate of product and service innovation in the industry"
  - "will not increase the likelihood of coordinated behavior among the major cellular telephone companies, who are expected to continue to compete vigorously to add and maintain subscribers on their networks"

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Efficiencies & Entry

- Merging firms may defend merger by showing that the efficiencies produced by the merger offset any anticompetitive harm
  - Possibly cost savings, improved/new products
- If after the merger entry of new firms is likely, this impacts post-merger equilibrium
  - If entry mitigates the anticompetitive effects of the merger then blocking the merger likely causes welfare losses

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Efficiencies/Market Power Trade-off
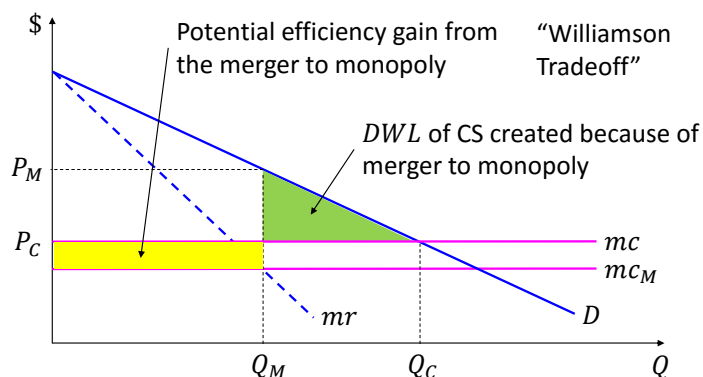
The box has slightly more area than the triangle. What does that imply?

See Figure 1-3 in Kwoka and White, Antitrust Revolution, Sixth Ed.

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Price Standard vs.
Total Surplus Standard

- "While U.S. enforcement officials have been described as "artfully vague" about the matter, it is generally agreed that efficiency gains have to be large enough to keep the post merger price from rising in the relevant market. This has been called the price standard" McFetridge (1998)
  - In contrast, the total surplus standard means that post-merger TS should be at least as large as pre-merger; Canada has an *explicit* TS standard

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Preview Readings

- Advice on tackling readings in this course
- Preview readings

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