ECON 4100: Industrial Organization

Lecture 1- Introduction and a review of perfect competition versus monopoly
Introductory Remarks

• Overview
  – study of firms and markets
  – strategic competition

• Different forms of competition
  – prices
  – advertising
  – product differentiation
Introduction

• IO is about how firms behave in markets
• …mainly the *non-competitive* ones: *strategic interaction*
• Whole range of business issues
  – price of flowers
  – which new products to introduce
  – merger decisions
  – methods for attacking or defending markets
Introduction

• We will use our economist insight to analyze problems in the real world

• We will learn a bit about the history of IO, linked to the history of competition policy (US mostly but Canada and Europe too)
Some history

• **WHY** do Industrial Organization?
• A lot to do with the longstanding tradition of public concern with *market power*
• Economists have normative views that favour competition and mistrust *market power*
Some history

• **WHY** do Industrial Organization?

“People of the same trade seldom meet together, even for merriment or diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices.”
Some history

– Sherman Antitrust Act (Standard Oil)

- *Sherman Act* (1890)
  – Section 1: prohibits contracts,
  – combinations and conspiracies “in restraint of trade”
  – Section 2: makes illegal any attempt to monopolize a market
**Competition Policy**

- *Clayton Act* (1914)
  - intended to prevent monopoly “in its incipiency”
  - makes illegal practices that “may substantially lessen competition or tend to create a monopoly”

- *Federal Trade Commission* established in the same year

- However, application affected by the *rule of reason*
  - proof of intent
  - “the law does not make mere size an offence”
The Structure- Conduct- Performance Paradigm

– Spectrum of markets: pure competition--pure monopoly
– Closer to monopoly means worse welfare loss (DWL)
– IO mission is then to identify link from market structure to firm conduct (pricing, advertising, etc) to market performance (deadweight loss)
– The essence of SCP should be very familiar but now we will make it more explicit
The Chicago School

- Both good & bad reasons for monopoly
- Potential entry can discipline even a monopoly
- Structure is endogenous? (causality difficult to determine)

• Post-Chicago

- Game Theoretic Emphasis
- Competitive Discipline can Fail
- Careful econometric testing to determine correct policy in actual cases
Strategic view of how firms interact

• How should a firm price its product given the existence of rivals?
• How does a firm decide which markets to enter?
• Incredible richness of examples:
  – collusion
  – exclusive dealing
  – predatory pricing
  – merger waves
  – …and many more
• At the heart of all of this is strategic interaction
**Strategic view of how firms interact**

- Rely on the tools of *game theory*
  - focuses on strategy and interaction
- Construct models: abstractions
- Remember the big difference between strategic and non-strategic behavior: strategic behavior implies taking into account other’s reactions
- It is like bowling (non-strategic) versus hockey (strategic)
The New Industrial Organization

• The “New Industrial Organization” is something of a departure
  – theory in advance of policy
  – recognition of connection between market structure and firms’ behavior

• Contrast pricing behavior of:
  – grain farmers at first point of sale
  – gas stations: Texaco, Mobil, Exxon
  – computer manufacturers
  – pharmaceuticals (proprietary vs. generics)
The New Industrial Organization

• Does not say much about the *internal organization* of firms
  – vertical organization is discussed
  – internal contracts are not
Let us start then from the beginning: SCP

- Edward Chamberlin
  …among other things coined the term *product differentiation*
  *The Theory of Monopolistic Competition* (1933)

- Joan Robinson
  *The Economics of Imperfect Competition* (also 1933)

- Joseph S. Bain
Efficiency and Market Performance

• Contrast two polar cases
  – perfect competition
  – monopoly

• What is *efficiency*?
  – no reallocation of the available resources makes one economic agent better off without making some other economic agent worse off
  – example: given an initial distribution of food aid will trade between recipients improve efficiency?
• Focus on profit maximizing behavior of firms
• Take as given the market demand curve

Equation: \( P = A - BQ \)

linear demand

• Importance of:
  – Time (static versus dynamic perspective)
  – short-run vs. long-run
  – willingness to pay

At price \( P_1 \) a consumer will buy quantity \( Q_1 \)
Perfect Competition

• *In the beginning there was perfect competition. And economists saw that it was good. So they assumed perfect competition 😊*
Perfect Competition

• Firms and consumers are *price-takers*
• Firm can sell as much as it likes at the ruling market price
  – do not really need many firms
  – do need the idea that firms *believe* that their actions will not affect the market price
• Therefore, marginal revenue equals price
• To maximize profit a firm *of any type* must equate marginal revenue with marginal cost
• So in perfect competition price equals marginal cost
MR = MC

• Profit is $\pi(q) = TR(q) - TC(q)$
• Profit maximization: $d\pi/dq = 0$
• This implies $dTR(q)/dq - dTC(q)/dq = 0$
• But $dTR(q)/dq = \text{marginal revenue}$
• $dTC(q)/dq = \text{marginal cost}$
• So profit maximization implies MR = MC
Perfect competition: an illustration

(a) The Firm

With market price $P_C$ the firm maximizes profit by setting $MR = MC$ and producing quantity $q_c$: $\square$

(b) The Industry

With market demand $D_1$ and market supply $S_1$, equilibrium price is $P_C$ and quantity is $Q_C$. With market price $P_C$, the firm maximizes profit by setting $MR = MC$ and producing quantity $q_c$. $\square$

Now assume that demand increases to $D_2$. With market demand $D_2$ and market supply $S_1$, equilibrium price is $P_1$ and quantity is $Q_1$. Existing firms maximize profits by increasing output to $q_1$. Excess profits induce new firms to enter the market: $\square$

• The supply curve moves to the right
• Price falls
• Entry continues while profits exist
• Long-run equilibrium is restored at price $P_C$ and supply curve $S_2$.
Perfect competition: additional points

• Derivation of the short-run supply curve
  – this is the *horizontal* summation of the individual firms’ marginal cost curves

Example 1: Three firms

<table>
<thead>
<tr>
<th>Firm 1: $q = MC/4 - 2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm 2: $q = MC/2 - 4$</td>
</tr>
<tr>
<td>Firm 3: $q = MC/6 - 4/3$</td>
</tr>
</tbody>
</table>

Invert these

Aggregate: $Q = q_1 + q_2 + q_3$

$= 11MC/12 - 22/3$

$MC = 12Q/11 + 8$
Example 2: Eighty firms

Each firm: \( q = \frac{MC}{4} - 2 \)

Invert these

Aggregate: \( Q = 80q \)
\[ = 20MC - 160 \]

\( MC = \frac{Q}{20} + 8 \)

• Definition of \textit{normal profit}
  – not the same as zero profit
  – implies that a firm is making the market return on the assets employed in the business (play ..\EXCELsimulations\PerfectCompetition.xls)
Monopoly

• The only firm in the market
  – market demand is the firm’s demand
  – output decisions affect market clearing price

At price $P_1$ consumers buy quantity $Q_1$

At price $P_2$ consumers buy quantity $Q_2$

Marginal revenue from a change in price is the net addition to revenue generated by the price change = $G - L$

Loss of revenue from the reduction in price of units currently being sold (L)

Gain in revenue from the sale of additional units (G)

$\text{Gain in revenue from the sale of additional units (G)}$

$\text{Loss of revenue from the reduction in price of units currently being sold (L)}$

At price $P_1$ consumers buy quantity $Q_1$

At price $P_2$ consumers buy quantity $Q_2$
Monopoly (cont.)

• Derivation of the monopolist’s marginal revenue

Demand: \( P = A - BQ \)
Total Revenue: \( TR = P \cdot Q = AQ - BQ^2 \)
Marginal Revenue: \( MR = \frac{dTR}{dQ} \)
\[ \Rightarrow MR = A - 2BQ \]

With linear demand the marginal revenue curve is also linear with the same price intercept but twice the slope of the demand curve.
Monopoly and profit maximization

- The monopolist maximizes profit by equating marginal revenue with marginal cost
- This is a two-stage process

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Demand</th>
<th>$/unit</th>
<th>MR</th>
<th>AC</th>
<th>MC</th>
</tr>
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Stage 1: Choose output where $\text{MR} = \text{MC}

- This gives output $Q_M$

Stage 2: Identify the market clearing price

- This gives price $P_M$

- $\text{MR}$ is less than price
- Price is greater than $\text{MC}$: loss of efficiency
- Price is greater than $\text{AC}$: Positive economic profit

Long-run equilibrium: no entry

Output by the monopolist is less than the perfectly competitive output $Q_C$
Next

• The monopolist is supposed to always operate along the elastic range of the demand curve
• Why?
• But this is a timeless static view that ignores that in the long run price-elasticity is higher than in the short run.
• The monopolist might stay within the inelastic range of the demand curve to avoid the long-run reaction by the consumers
Next

• Efficiency
• Consumer Surplus and Producer Surplus revisited
• Read Ch. 2
Next

- barriers to entry
- market concentration measures
- market power
- product differentiation
- minimum efficient scale