



EE481 Industrial Economics

Market Structures (I)*

Semester 1/2016

*Carlton D and Perloff J., *Modern Industrial Organization*, 4th Edition, 2015, Pearson.

1

Market Structures

Type of Market	Perfect Competition	Monopoly	Monopolistic Competition	Oligopoly
Number of Firms	Many	One	Many	Few
Similar or Differentiated Products	Identical	Identical	Differentiated	Similar or Differentiated
Cost of Information	Low	Low	Costly	Small to Significant
Barriers to Entry	Low	High	Low	High but not impossible
Examples	Agriculture, Forestry, Personal Services	Utilities, Government Services	Restaurants, Retail, Services	Wholesale, construction, energy, Manufacturing
Special Characteristics	$\pi = 0$ in long run, $P = MR = MC$, $P = \text{Min}(ATC)$ in long run	$\pi > 0$ in long run, $P = MR > MC$, "Deadweightloss"	$\pi = 0$ in long run, $P = MR > MC$ and $P = ATC$ but $> \text{min}(ATC)$ – inefficient scale	Indeterminant behavior – incentive to compete or collude

2

Market Structure 1: Perfect Competition

- Consider market for a single good.
- The perfectly competitive firm is a price taker: it cannot influence the price that is paid for its product.
- This arises due to consumers' indifference between the products of competing firms => for example, buy from store with lowest price.
- Consumers' indifference arises from:
 - Product homogeneity
 - Consumers have perfect information
 - No transactions cost
 - Many firms
- PC firm faces horizontal demand curve at market price p

3

PC's Profit Maximization Problem

4

PC Firm's Shutdown Decisions

- A firm produces only when its profits from producing exceed the costs it would avoid by not producing
- In short-run: avoidable costs do not include sunk costs. Shut down when revenues fall short of avoidable costs $\Leftrightarrow pq < \text{Avoidable costs}(q)$.
- Consider two cases:
 - 1) All fixed costs are sunk. Avoidable costs = $VC(q)$:
Shut down once _____
 - 2) Proportion α of fixed costs not sunk. Avoidable costs = $VC(q) + \alpha F$:
shutdown once _____
- In long-run: avoidable costs include sunk cost. Shut down when _____

5

The Perfectly-Competitive Industry: Short run

- In the short run: Number of firms fixed
- Industry supply curve: sum of individual firms' short-run supply curves. Zero supply at prices below shutdown point.
- Industry demand curve: downward sloping.
- Price determined by intersection of industry demand and supply curves.
- In short-run equilibrium: positive profits for each firm as long as $p > AC(q)$.

6

Short-Run Equilibrium

7

The Perfectly Competitive Industry: Long-run

- Number of firms can vary
- Free entry and exit:
- Any short-run profits soaked up by new firms in long-run =>
Price is driven down to the minimum of the AC curve
- Long-run industry supply curve: horizontal at minimum of the average cost curve
- LR supply curve may be upward-sloping if min AC is rising in market demand Q (due, for example, to resource scarcity)

8

Long-Run Equilibrium

9

Elasticities and the Residual Demand Curve

- If either the demand or supply curve shifts, the competitive equilibrium changes.
- The shapes of the demand and supply curves influence how the new equilibrium compares to the old.

Ex:

10

The Residual Demand Curve of Price Takers

Price elasticity of demand:

$$\epsilon \equiv \frac{\Delta q(p)}{\Delta p} \frac{p}{q} = \frac{\partial \log q(p)}{\partial \log p} = \frac{\partial q(p)}{\partial p} \frac{p}{q(p)}$$

Steep demand curves are *inelastic*

Flat demand curves are *elastic*

Residual demand: $D_r(p) = D(p) - S_o(p)$.

At competitive equilibrium, firm i 's residual demand elasticity is:

$\epsilon_i = \epsilon n - \eta_o(n - 1)$ where η_o is the "residual supply" elasticity:

$$\eta_o = \frac{\partial S_o(p)}{\partial p} \frac{p}{S_o(p)}$$

Inelastic industry demand (low $|\epsilon|$) consistent with elastic residual demand curve (high $|\epsilon_i|$) as n increases

11

The Residual Demand Curve of Price Takers

12

TABLE 3.1 Price Elasticity for a Single Firm

Number of Firms n	Market Elasticity		
	Inelastic $\epsilon = -0.5$	Unitary $\epsilon = -1$	Elastic $\epsilon = -5$
10	-5	-10	-50
25	-12.5	-25	-125
50	-25	-50	-250
100	-50	-100	-500
500	-250	-500	-2,500
1,000	-500	-1,000	-5,000

Note: Because the supply of the other identical firms is assumed to be perfectly inelastic ($\eta_0 = 0$), the elasticity of demand facing a particular firm is $\epsilon_i = n\epsilon$.

13

Desirability of PC Outcome

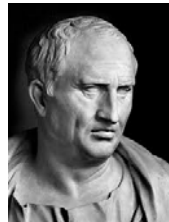
- $p = MC(q) = \min AC(q)$
- Production at $p = MC(q)$: rm produces an additional unit only if it can cover the production costs. Producer surplus is maximized.
- Value placed on marginal unit of the good p exactly equals the cost of producing that marginal unit (**consumption efficiency**). Consumer surplus is maximized.
- Production at minimum average cost: no better alternative use of resources is possible (**production efficiency**). In other words, each firm operating at minimum efficient scale.

14

Efficiency and Welfare

The welfare of the people is the chief law.

—Cicero (3 January 106 BC – 7 December 43 BC)



- The competitive equilibrium has desirable efficiency and welfare properties.
- No one can be made better off without making someone else worse off in the competitive equilibrium. ()

15

16

Welfare Theorems

- Weak assumptions about preferences and technological possibilities yield general results on competitive equilibrium
 - **1st Welfare Theorem:** A competitive equilibrium is Pareto Optimal. A benevolent social planner cannot improve on the competitive allocation.
 - **2nd Welfare Theorem:** Any Pareto-optimal allocation can be decentralized by a choice of the right prices and an appropriate redistribution of income among consumers.
- Key property of competitive equilibrium: each good is sold at marginal cost. Prices induce consumers to internalize the (social) cost of producing an additional unit of the good.

17

Entry and Exit

- Nice outcome in perfect competitive world depends crucially on free-entry assumption. Fixed costs of entry are present in many markets: are they a barrier to entry?
 - Fixed costs borne equally by all firms: accommodated by free entry assumption
 - Fixed costs which affect entrant firms disproportionately: barriers to entry
- **"First mover advantage":** *incumbent muddies waters to make subsequent entry difficult.*

18

Restrictions on Entry

- In many industries, governments or groups of firms collectively set licensing requirements that restrict entry.
- Such entry restrictions elevate prices above competitive levels.

19

Definition of Barriers to Entry

- Barrier to entry is anything that prevents an entrepreneur from instantaneously creating a new firm in a market
- Barriers to entry is often used to refer to the costs of entering and the time it takes for entry to occur.

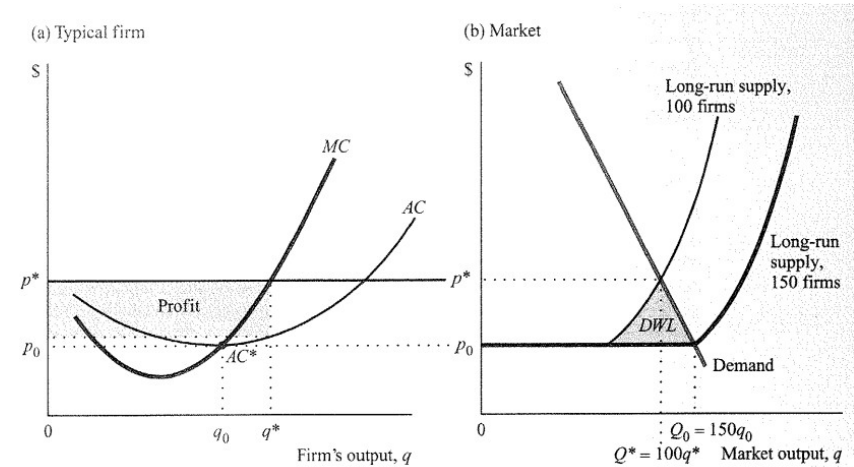
20

Identifying Barriers to Entry

- Bain (1956) identified three sources of barriers to entry:
 - Absolute cost advantage
 - Economies of large-scale production
 - Product differentiation

21

Long-Run Equilibrium with an Entry Restriction



22

23

24