

12 Monopolistic Competition and Oligopoly

ECO202 Fall 2019

November 7, 2019

Outline

1. Monopolistic Competition
2. Oligopoly
3. Stability for Oligopoly

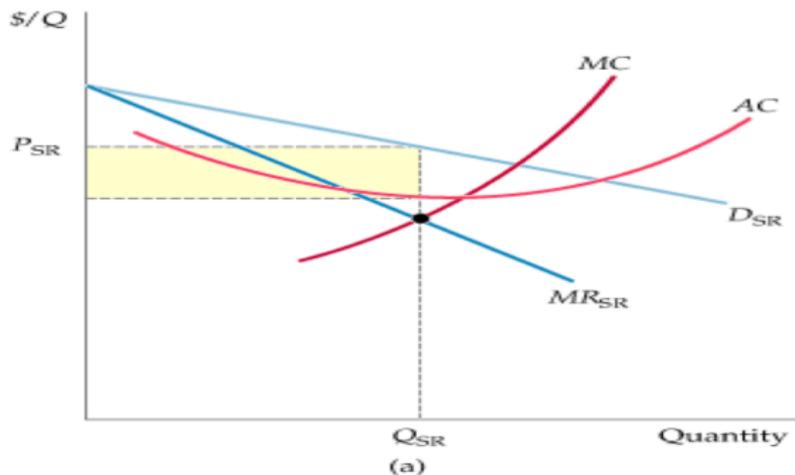
Monopolistic Competition

Monopolistic Competition

Monopolistic competition is a market in which firms:

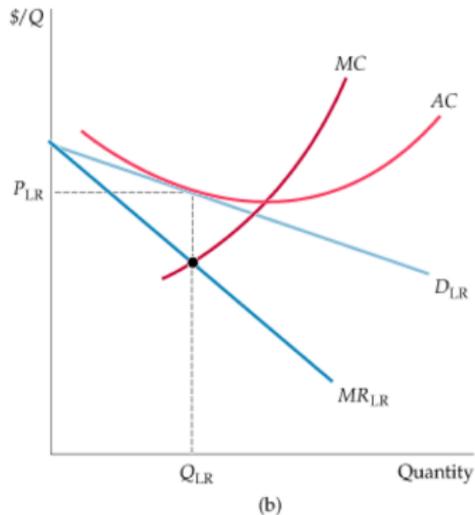
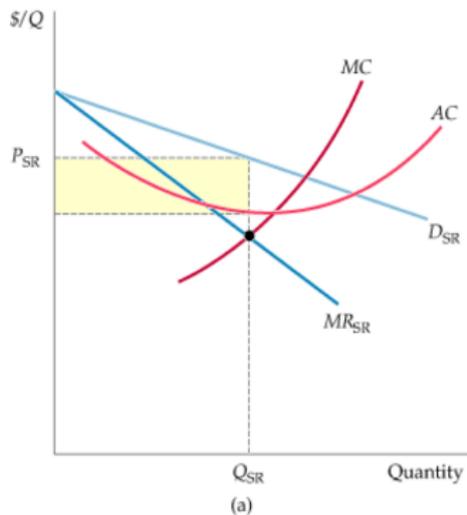
- produce a slightly different product
- can enter and exit freely

Demand for firm's product



Different product \implies downward-sloping demand curve

Monopolistic competition equilibrium



Welfare properties

Under monopolistic competition:

- Price $>$ MC (mark-up pricing)
- Deadweight loss
- Optimal Q is below Q at AC-min

Should government regulate this market structure?

Probably not worth regulating

If demand is elastic:

- Mark-up is small
- Deadweight loss is small
- Q is not far from Q at AC-min

Plus the benefit:

- Product diversity; consumers like choices

Monopolistic competition is not too inefficient

Oligopoly

Oligopoly

Oligopoly is a market in which:

- Only a few firms account for most of total production
- Products are only slightly different
- Barriers to entry block new firms

Oligopoly equilibrium

Equilibrium may be the same as monopolistic competition; or same as perfect competition or monopoly

It depends on **strategy** – how firms behave in relation to each other

The equilibrium P^* , Q^* is when behavior is stable

Oligopoly strategies

Strategy: my behavior conditional on your behavior

Possible behaviors of oligopoly firms involve setting:

- Prices
- Output
- Advertising
- Investment

Math version of strategy is a reaction function:

$$Q_{me} = f(Q_{you}) \quad P_{COKE} = f(P_{PEPSI})$$

Simple strategies

Oligopolists might follow strategies set down by:

- **Cournot** – fix output
- **Bertrand** – fix price
- **Stackelberg** – one firm goes first

Cournot model

Each firm treats output of its competitors as fixed

All firms decide simultaneously how much to produce

Each firm estimates its own demand curve based on what it thinks the other firms will produce

This solution is stable as long as firms predict each others' output correctly

Bertrand model

Each firm treats the prices of its competitors as fixed

All firms decide simultaneously what price to charge

This solution is stable as long as firms predict each others' prices correctly

Example: Bertrand 1/2

Market demand: $P=30-Q_T$

Two firms (1 and 2): $Q_T = Q_1 + Q_2$

Assume equilibrium at

$$MC_1 = MC_2 = AC_1 = AC_2 = \$3$$

and $Q_1 = Q_2 = 9$

$$\therefore P = 30 - 2 \times 9 = \$12$$

and $\pi_1 = \pi_2 = Q \times (P - AC) = 9(12 - 3) = \81

Example: Bertrand 2/2

If firms decide to set their own prices, eventually they will set $P=MC$

$$3=30-Q_T \implies Q_T = 27$$

$$Q_1 = Q_2 = 13.5$$

$$\pi_1 = \pi_2 = Q(P - AC) = 0$$

Stackelberg model

One firm A sets its output before the other firms do

The other firms decide what to do after they see what firm A has done

Firm A has first-mover advantage: larger π

Example: Stackelberg model 1/2

Two firms (1 and 2): $Q_T = Q_1 + Q_2$

Assume $P=30-Q_T$ $MC_1 = MC_2 = 0$

Firm 1 moves first; Firm 2 responds

Firm 2s reaction curve: $Q_2 = 15 - 0.5Q_1$

Calculate what firm 1 should do to max π , then
derive optimum for firm 2

Example: Stackelberg model 2/2

Revenue for Firm 1:

$$\begin{aligned}TR_1 &= PQ_1 = (30 - Q_T)Q_1 \\ &= (30 - (Q_1 + 15 - 0.5Q_1))Q_1 \\ &= 30Q_1 - 15Q_1 - 0.5Q_1^2 \\ &= 15Q_1 - 0.5Q_1^2\end{aligned}$$

$$MR_1 = 15 - Q_1$$

$$\text{At } \pi \text{ max } MR_1 = MC_1 = 0$$

$$Q_1 = \mathbf{15}$$

$$Q_2 = 15 - 0.5 \times 15 = \mathbf{7.5}$$

Stability for Oligopoly

Oligopoly firms hate uncertainty

Oligopoly firms do not know what the equilibrium will be

If these firms find equilibrium, stick with it

If one firm's π suddenly falls, was it because of:

- new strategy by other firms?
- changed in demand by consumers?

Best option is to keep market stable

Ways to keep market stable

1. Excess capacity (to deter entry)
2. Limit pricing (to deter entry)
3. Price signaling (informational)
4. Price matching (informational and deterrent)
5. Keep price stable even if MC changes
6. Form cartel

Keep price stable 1/2

Liquid sugar market:

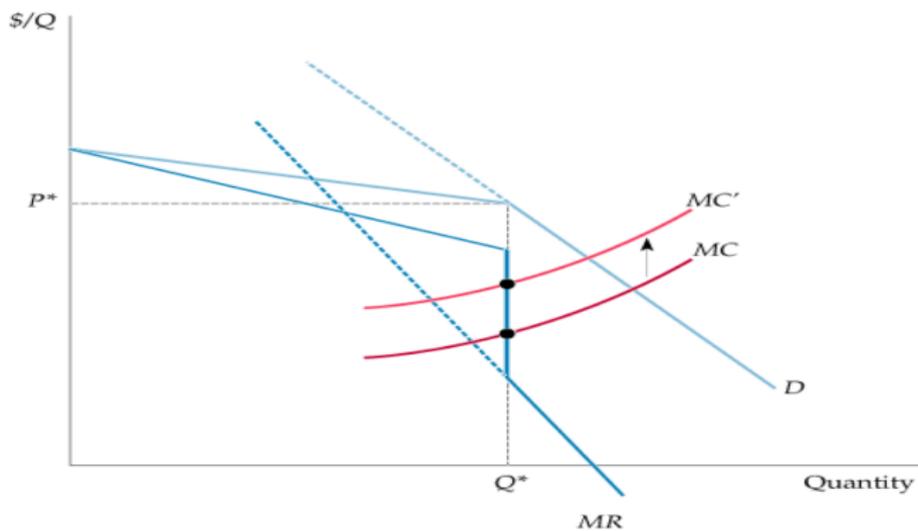
If Coke sets $P_{Coke} > P^*$, Pepsi keeps $P_{Pepsi} = P^*$

- Demand for Coke falls a lot

If Coke sets $P_{Coke} < P^*$, Pepsi also sets $P_{Pepsi} < P^*$

- Demand for Coke rises only a little

Keep price stable 2/2



Form cartel

Cartel: agreement across firms to cooperate in setting prices/output

Can drive prices above competitive prices if:

- Demand for good is inelastic
- Members of cartel do not cheat
- Cartel controls most of world supply of good
- Non-cartel supply is inelastic

Any Questions?

Monopolistic Competition

Oligopoly

Stability for Oligopoly