

# **LECTURE 3.6**

## **OLIGOPOLY – THE BERTRAND MODEL**

# THE BERTRAND MODEL

## Assumptions

- firms compete by simultaneously choosing prices
- firms interact in a single period
- homogeneous product
- rationing rule:
  - $p_i < p_j \forall j \Rightarrow$  firm  $i$  captures whole market
  - $p_i = p_j \forall j \Rightarrow$  firms share the market equally

The key in the Bertrand model is that each firm chooses a level of **price** assuming that the **price** of rivals / competitors are given or fixed.

# THE BERTRAND MODEL

Start with a simple example in which each firm (A & B) has positive marginal cost equal to 10. What does the market outcome (or Nash Equilibrium) look like?

Suppose that firm A is setting price equal to  $P_A$ . What should firm B do?

Set  $P_B = P_A - \varepsilon$ .

Then: A responds by setting  $P_A = P_B - \varepsilon$

The end result:  $P_A = P_B = MC$

In this Nash Equilibrium, neither firm will have an incentive to change its pricing decision given the other firms choice.

The discussion here is premised on an (implicit) assumption that the products being sold are homogeneous. We will come back to differentiated products later this week.

# THE BERTRAND MODEL

Start with a simple example in which each firm (A & B) has positive marginal cost equal to 10. What does the market outcome (or Nash Equilibrium) look like?

Suppose that firm A is setting price equal to  $P_A$ . What should firm B do?

Set  $P_B = P_A - \varepsilon$ .

Then: A responds by setting  $P_A = P_B - \varepsilon$

The end result:  $P_A = P_B = MC$

In this Nash Equilibrium, neither firm will have an incentive to change its pricing decision given the other firms choice.

The discussion here is premised on an (implicit) assumption that the products being sold are homogeneous. We will come back to differentiated products later this week.

# THE BERTRAND MODEL

In the unique Nash equilibrium firms set price equal to marginal cost. i.e. firms earn no economic profits, even with only two firms!

Resolutions:

- the high priced firm may have some residual demand
  - capacity constraints
  - consumer loyalty
  - limited product comparability
- price commitment
- repeated games
- product differentiation