

Kosmas Marinakis, Ph.D.

## Lecture 13

Business strategies



Industrial  
Economics

### Strategic relevance

- ★ In some games you have an **advantage** by moving first  
tic – tac – toe
- ★ In other games moving first is a **distinct disadvantage**  
rock – scissors – paper
- ★ In oligopoly there are **two opposite possibilities** for the **strategic relevance** between choice variables:
  - ◆ In Cournot, as your rival increases their **quantity** you tend to...
  - ◆ In Bertrand as your rival increases their **price** you tend to...
- ★ Strategic variables seem to be related in a **causative manner** either **positively** or **inversely**.

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### Strategic relevance

## Reaction functions

- ★ When we have **interaction**, each player's behavior is analyzed by deriving **reaction functions**
- ★ According to those, each player has an **optimal reaction plan** to the **entire range of possible actions** of its rivals
- ★ When there is **coincidence** of reactions we come to **NE**
- ★ The reaction function can hint the **intensity** of competition
  - ◆ High slope means that a change in rival's choice will be addressed by a **larger change** in own choice variable
  - ◆ Low slope means that a change in rival's choice will be addressed by a **smaller change** in own choice
  - ◆ **Caution:** not slope from the graph! \_

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### Strategic relevance

## Cournot and Bertrand reactions

- ★ In Cournot, reaction functions are **negatively** sloped
 
$$q_2 = \frac{a - q_1 - c}{2}$$
 an **increase** in rival's **quantity** will be optimally addressed by a **decrease** in **own quantity**
- ★ In Bertrand, reaction functions are **positively** sloped
 
$$p_2 = \frac{a + dc + p_1}{2d}$$
 an **increase** in rival's **price** will be optimally addressed by an **increase** in **own price**
- ★ Also, in Cournot there is a **first-mover advantage** – in Bertrand there is a **last-mover advantage** \_

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### Strategic relevance

## Strategic substitutes / complements

- ★ When the reaction functions are downward-sloping, the actions of the firms are **strategic substitutes**
  - ◆ Increase in rival's choice variable will partially **substitute** the effect of own choice variable
  - ◆ So, own choice variable needs to **decrease**
  - ◆ Tendency to move to **opposite direction** than rival
- ★ When the reaction functions are upward-sloping, the actions of the firms are **strategic complements**
  - ◆ Increase in rival's choice variable **provides room for increase** in own choice variable
  - ◆ Tendency to move to **same direction** with rival \_

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### Strategic relevance

## General entry setting

- ★ Entry game with incumbent ( $M$ ) and potential entrant ( $E$ )
- ★ Timing:
  - ◆ **Period 1:** Incumbent chooses  $K_M$
  - ◆ **Period 2:** Entrant observes  $K_M$  and decides weather to enter
  - ◆ **Period 3:** Firms choose simultaneously strategies  $x_M \in X$ ,  $x_E \in X$
- ★ If  $E$  **aborts**:  $\Pi_M(K_M, x_M(K_M), 0) = \Pi_M$
- ★ If  $E$  **enters**:  $\Pi_M(K_M, x_M(K_M), x_E(K_M))$  and  $\Pi_E(K_M, x_M(K_M), x_E(K_M))$
- ★ Thus NE is:  $(x_M^*(K_M), x_E^*(K_M))$  \_

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Entry

### The effect of $K_M$ on $\Pi_E$

- ★ At **NE** profit for  $E$  becomes
 
$$\Pi_E(K_M, x_M^*(K_M), x_E^*(K_M))$$
- ★ If the incumbent wants to **deter** it will set
 
$$K_M = K^* : \Pi_E(K^*, x_M^*(K^*), x_E^*(K^*)) = 0$$
- ★ The **response of  $\Pi_E$**  in changes of  $K_M$  is
 
$$\frac{d\Pi_E}{dK_M} = \frac{\partial \Pi_E}{\partial K_M} + \frac{\partial \Pi_E}{\partial x_M} \frac{dx_M}{dK_M} + \frac{\partial \Pi_E}{\partial x_E} \frac{dx_E}{dK_M}$$
- ★ In the following we will **assume** that the direct effect is **zero** (usually is).

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Entry

### The strategic effect

- ★ From the previous, the investment of the incumbent has a **strategic effect** on the profit of the entrant
 
$$\frac{d\Pi_E}{dK_M} = \frac{\partial \Pi_E}{\partial x_M} \frac{dx_M}{dK_M}$$
- ★ This effect may be **negative**
  - ◆ For instance, any investment in **rent-seeking**
  - ◆ In this case, we say that the incumbent is **tough**
- ★ Conversely, it can also be **positive**
  - ◆ For instance, any investment to **widen the market**
  - ◆ In this case, we say that the incumbent is **soft**.

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### Business strategies for the incumbent

- ★ Any incumbent will deter if it is **feasible** and **profitable** if it **cannot** deter, it will have to **accommodate**
- ★ In any case, the incumbent can **improve its position** in the last stage **by adjusting**  $K_M$  in the first stage
- ★ Should the incumbent **increase or decrease**  $K_M$ ?
- ★ This will depend on **two factors**:
  - ◆ The **strategic relevance** between  $x_M$  and  $x_E$
  - ◆ The **toughness or softness** of the incumbent.

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Business strategies

### 1. Substitutability and toughness

$x_M, x_E$ strategic <u>substitutes</u> downward slopping reactions	Incumbent is <u>tough</u> strategic effect is <b>negative</b>
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- ★ **Example:**  $K_M$  may be **excess capacity** and  $x$  **quantities**
- ★ Increase in  $K_M$  has **negative impact** on  $\Pi_E$
- ★ At **every**  $x_M$  the entrant must now set a **lower**  $x_E$ 
  - ◆ It may be **feasible** and **profitable** for the incumbent to set  $K_M$  **high enough** for deterrence
  - ◆ If this is not possible, **overinvestment still helps** the incumbent to accommodate from a better position
- ★ This is the **top-dog** strategy.

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Business strategies

### 2. Substitutability and softness

$x_M, x_E$ strategic <u>substitutes</u> downward slopping reactions	Incumbent is <u>soft</u> strategic effect is <b>positive</b>
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- ★ **Example:**  $K_M$  may be **advertisement** and  $x$  **quantities**
- ★ Increase in  $K_M$  has **positive impact** on  $\Pi_E$
- ★ At **every**  $x_M$  the entrant can now set a **higher**  $x_E$ 
  - ◆ Investment **worsens** the incumbent's **strategic position** in the forthcoming competition stage
  - ◆ It may be possible to set  $K_M$  **low enough** for deterrence
  - ◆ In accommodation, **low**  $K_M$  makes  $M$  more competitive
- ★ This is the **lean-and-hungry** strategy.

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Business strategies

### 3. Complementarity and toughness

$x_M, x_E$ strategic <u>complements</u> upward slopping reactions	Incumbent is <u>tough</u> strategic effect is <b>negative</b>
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- ★ **Example:**  $K_M$  may be **excess capacity** and  $x$  **prices**
- ★ Increase in  $K_M$  has **negative impact** on  $\Pi_E$
- ★ For deterrence the incumbent must **overinvest**
  - ◆ This allows  $M$  to keep  $x_M$  **low enough**, so that  $E$  **cannot match** it with low  $x_E$  and will **abort** (**top-dog** strategy)
- ★ For accommodation the incumbent will **underinvest**
  - ◆  $M$  sets a **high**  $x_M$  and **hopes** that the **entrant follows**
  - ◆ This is the **puppy-dog** strategy.

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Business strategies

### 4. Complementarity and softness

$x_M, x_E$ strategic complements upward sloping reactions	Incumbent is <u>soft</u> strategic effect is <u>positive</u>
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- ★ **Example:**  $K_M$  may be **advertisement** and  $x$  **prices**
- ★ Increase in  $K_M$  has **positive impact** on  $\Pi_E$
- ★ For **deterrence** the incumbent must **underinvest**
  - ◆ Make **hard** for E to **match** a low  $x_M$  with  $x_E$  and will **abort** (**lean-and-hungry** strategy)
- ★ For **accommodation** the incumbent will **overinvest**
  - ◆ High  $K_M$  increases both  $\Pi_E$  and  $\Pi_M$ , M hopes for  $x_E = x_M$
  - ◆ This is the **fat-cat** strategy . .

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Business strategies Applications

### Deterrence – quantity competition

- ★ NE is **initially** at A
- ★ Increase in  $K_M$  **reduces**  $c_M$  and shifts  $R_M$  **outwards**
  - ◆ NE moves at B
  - ◆  $q_M$  is **higher**,  $q_E$  is **lower**
- ★ The incumbent is now **tougher** for any given  $q_E$ ,  $q_M$  is now higher
- ★ If  $K_M$  reaches  $K^*$  entry will become **unprofitable** for E  
*sufficient over-investment leads to deterrence*
- ★ This is a **top-dog** strategy .

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Business strategies Applications

### Accommodation – quantity competition

- ★ Similar scenario as in deterrence  
 $K^*$  is perhaps **too high** and thus, **non-profitable** for the incumbent
- ★ M still has reason to **over-invest**
  - ◆ Increase in  $K_M$  causes the **market share** for M to be **inflated** at the expense of E
  - ◆ More **aggressive behavior** by M (increase in  $q_M$ ) leads to a **softer action** by E (fall in  $q_E$ )
- ★ Again, this is a **top-dog** strategy .

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Business strategies Applications

### Deterrence – price competition

- ★ NE is **initially** at A
- ★ Increase in  $K_M$  **reduces**  $c_M$  and shifts  $R_M$  **inwards**
  - ◆ NE moves at B
  - ◆  $p_M$  is **lower**,  $p_E$  is **lower**
- ★ The incumbent is now **tougher** for any given  $p_E$ ,  $p_M$  is now **lower**
- ★ If  $K_M$  reaches  $K^*$  entry will become **unprofitable** for E  
*over-investment causes deterrence*
- ★ Again, this is a **top-dog** strategy .

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Business strategies Applications

### Accommodation – price competition

- ★ **Increase** in  $K_M$  **shifts** M's reaction function to the **left**
- ★ Investment makes M **tough**
- ★ At B there will be **lower prices** but **no deterrence**
- ★ Competition with lower prices is **not good for neither** firm
- ★ M has **no reason** to be aggressive and, thus, has an **incentive to under-invest**
- ★ This is a **puppy-dog** strategy . .

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Business strategies Applications

### Contestability

- ★ While examining deterrence, it becomes apparent that markets where entry is not fully barred **cannot be exploited monopolistically**
  - ◆ A firm may be **alone** in the market but **cannot** charge  $p_M$
  - ◆ This was pointed out by Baumol, Panzar and Willig in the 80s
- ★ If entry involves no **sunk** costs; exit is **free**; product does not require **R&D**; costs are **similar**; incumbents **commit** for the entire period when setting price  
market is **perfectly contestable** by fear of hit & run entry
- ★ In such markets the incumbent will **voluntarily moderate** the price .

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## Contestability and market power

- ★ Under economies of scale market power can be ***maintained***
  - ◆ Incumbents will tend to apply *top-dog* or *fat-cat* strategies to gain cost advantage
  - ◆ **Examples:** super-markets, banks
- ★ Under constant economies or diseconomies market power is ***totally eliminated***
  - ◆ Entrants can *hit & run* at any time there is a profit opportunity (enter – undercut – grab the money – exit)
  - ◆ **Examples:** hair salons, sunbed rentals

Thank you!



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