

# Static and dynamic games, preventing the entry and predation

Industrial organization – lecture 2

# Cournot model

*Pepall et al. (2014, pp. 222–228)*

2 firms with

- the same marginal cost  $c_1 = c_2 = c$
- zero fixed cost  $F_1 = F_2 = 0$

Inverse demand function:  $p = A - (q_1 + q_2)$

What is the Cournot equilibrium?

What is the profit?

# Stackelberg model

*Pepall et al. (2014, pp. 265–268)*

2 firms:

- firm 1 is the leader
- firm 2 is the follower

Both firms have

- the same marginal cost  $c_1 = c_2 = c$
- zero fixed cost  $F_1 = F_2 = 0$

Inverse demand function:  $p = A - (q_1 + q_2)$

What is the Stackelberg equilibrium?

What is the profit?

What is the reason for the dominance of the leader?

# Limit output and limit price models

*Pepall et al. (2014, pp. 289–291)*

Stackelberg + the follower has one-time sunk entry costs  $F$ .

What quantity  $q_L^d$  would deter entry?

When does the leader choose the quantity  $q_L^d$ ?

# Capacity expansion as a credible entry-detering commitment

*Pepall et al. (2014, pp. 291–299)*

Dixit, A. (1980). The role of investment in entry-deterrence. *The economic journal*, 90(357), 95–106.

A dynamic two-stage game between two firms:

1. The incumbent chooses the capacity level  $\overline{K}_1$  at a cost  $r\overline{K}_1$ .
2. Cournot game:

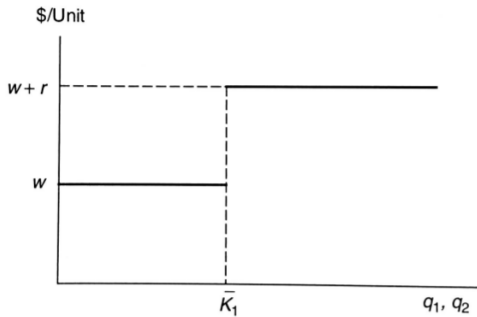
The incumbent's costs are

$$c_1(q_1) = \begin{cases} wq_1 + r\overline{K}_1 + F_1 & \text{for } q_1 \leq \overline{K}_1 \\ (w + r)q_1 + F_1 & \text{for } q_1 > \overline{K}_1 \end{cases}$$

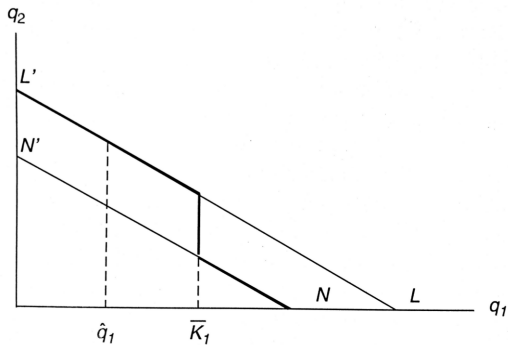
The entrant's costs are

$$c_2(q_2) = (w + r)q_2 + F_2$$

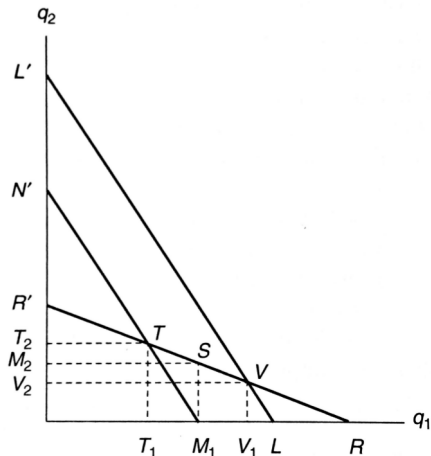
# The effect of previously acquired capacity



## The incumbent's best response in stage 2

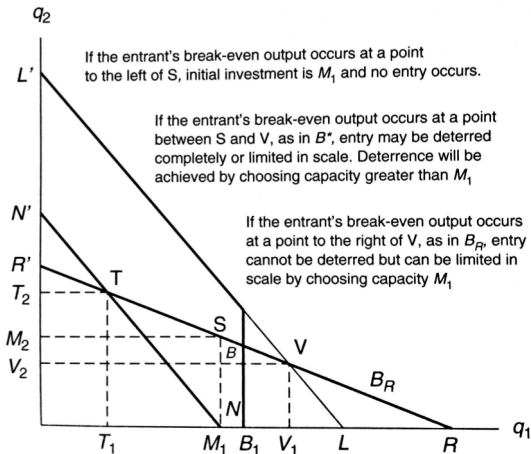


# The rational bounds on the incumbent's choice of $\overline{K}_1$





# Possible locations of the entrant's break-even point



# Evidence on predatory capacity expansion

*Pepall et al. (2014, pp. 304–309)*

- Alcoa case – increased capacity 8x between 1912 and 1934
- Weiman and Levin (1994) – preemptive investment in SBT
- Safeway in Edmonton in 1960s and 1970s
- DuPont production of titanium dioxide
- Excess capacity expansion in Texas hotels