

Oligopoly Theory (9)

Entry Deterrence

Aim of this lecture

- (1) To understand the concept of entry deterrence.
- (2) To understand the story of multi-store paradox.
- (3) To understand the mechanism of entry deterrence by long-term contracts.

Outline of the 9th Lecture

9-1 Capacity Investment and Entry Deterrence

9-2 Limit Pricing

9-3 Market Pre-Emption and Entry Deterrence

Timeline

Firm 1 (the incumbent) chooses whether it makes some strategic commitment or not.

After observing the strategic commitment made by firm 1, firm 2 chooses whether or not to enter the market.

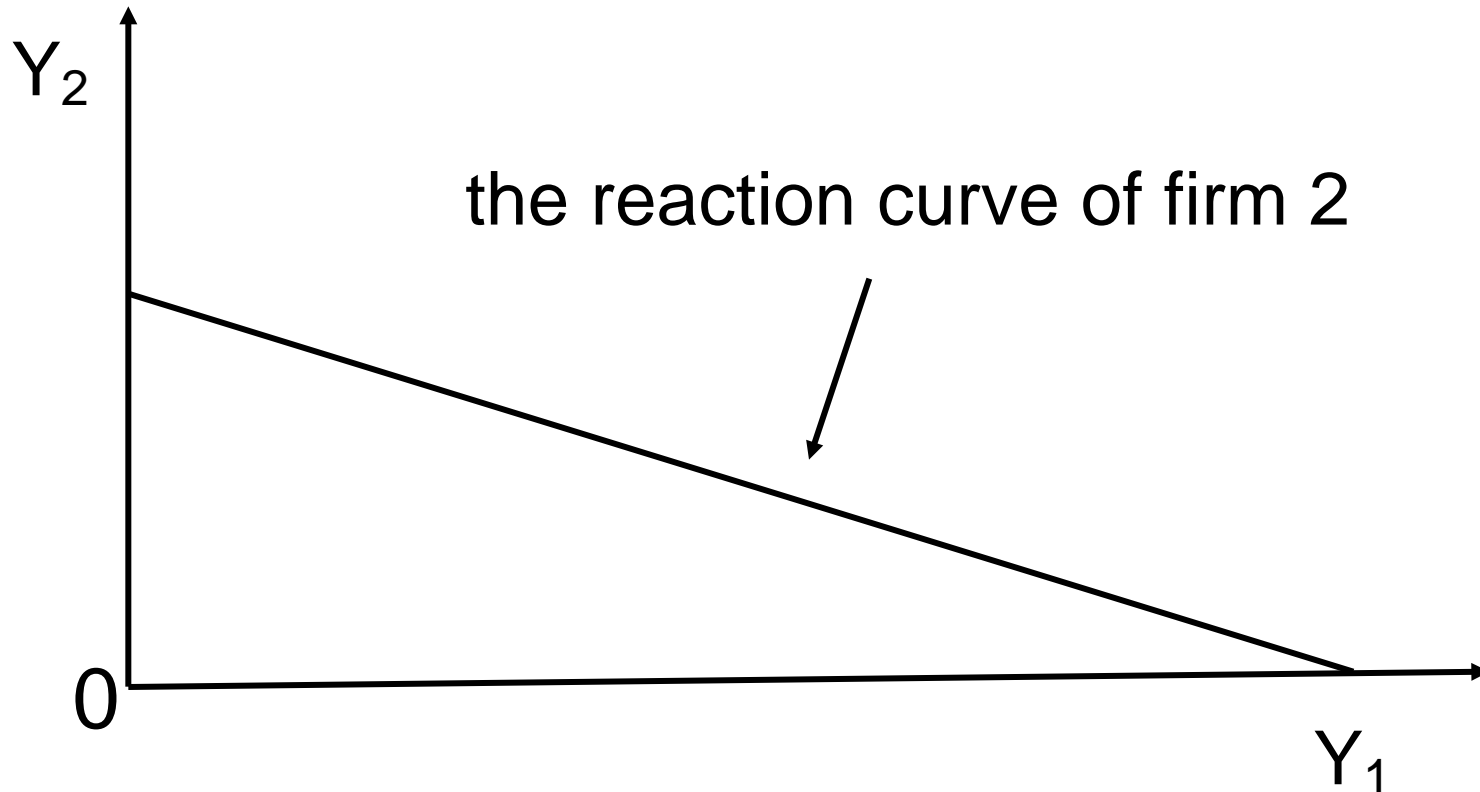
After observing the firm 2's decision on entry, both firms face Cournot (or Bertrand) competition.

Entry Deterrence

Entry Block: Even if the incumbent does not care about a new entrant and takes optimal behavior without any strategic commitment, the new entrant cannot enter the market.

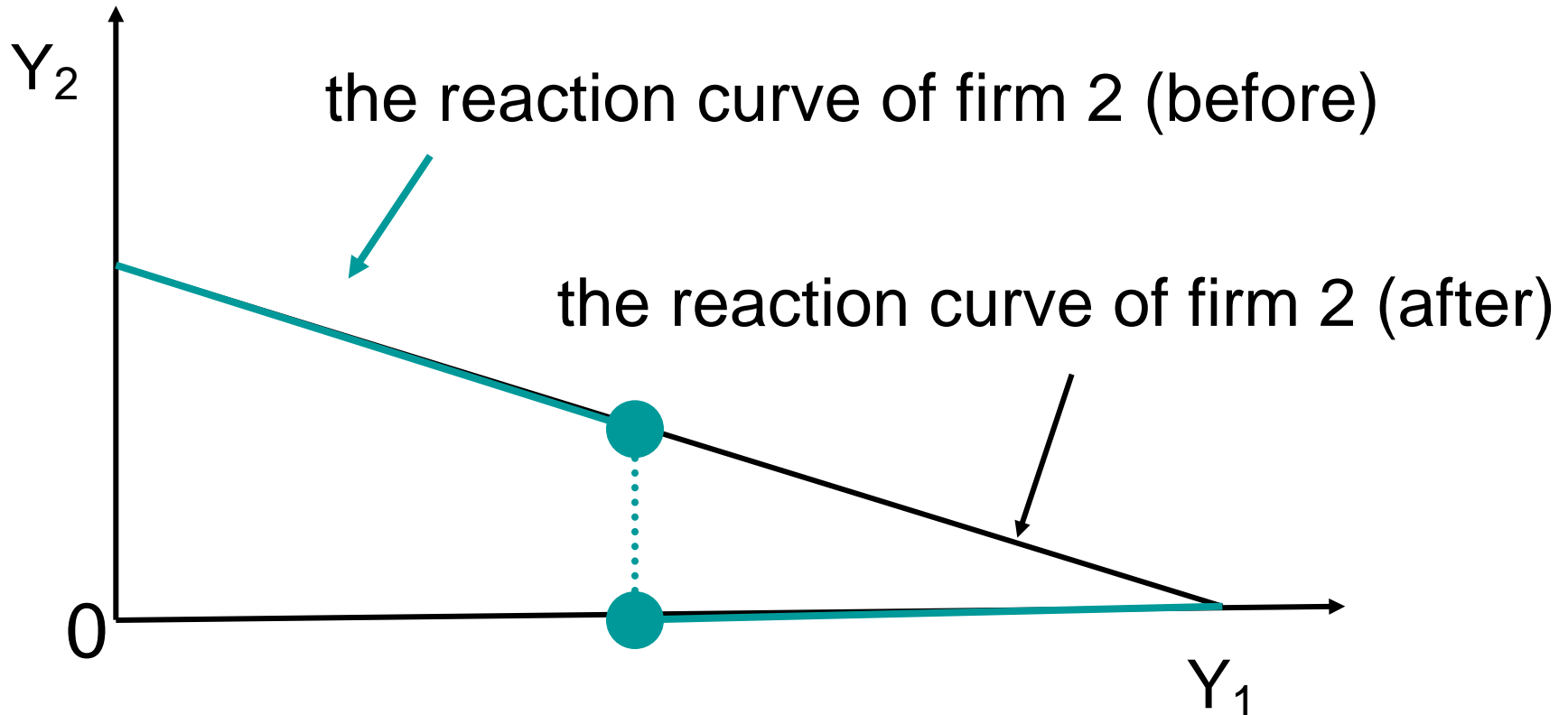
Entry Deterrence: If the incumbent does not care about a new entrant and takes optimal behavior without strategic commitment, the new entrant enters the market. Thus, the incumbent makes strategic commitment so as to prevent the new entrant from entering the market.

the reaction curve of the new entrant (after the entry)

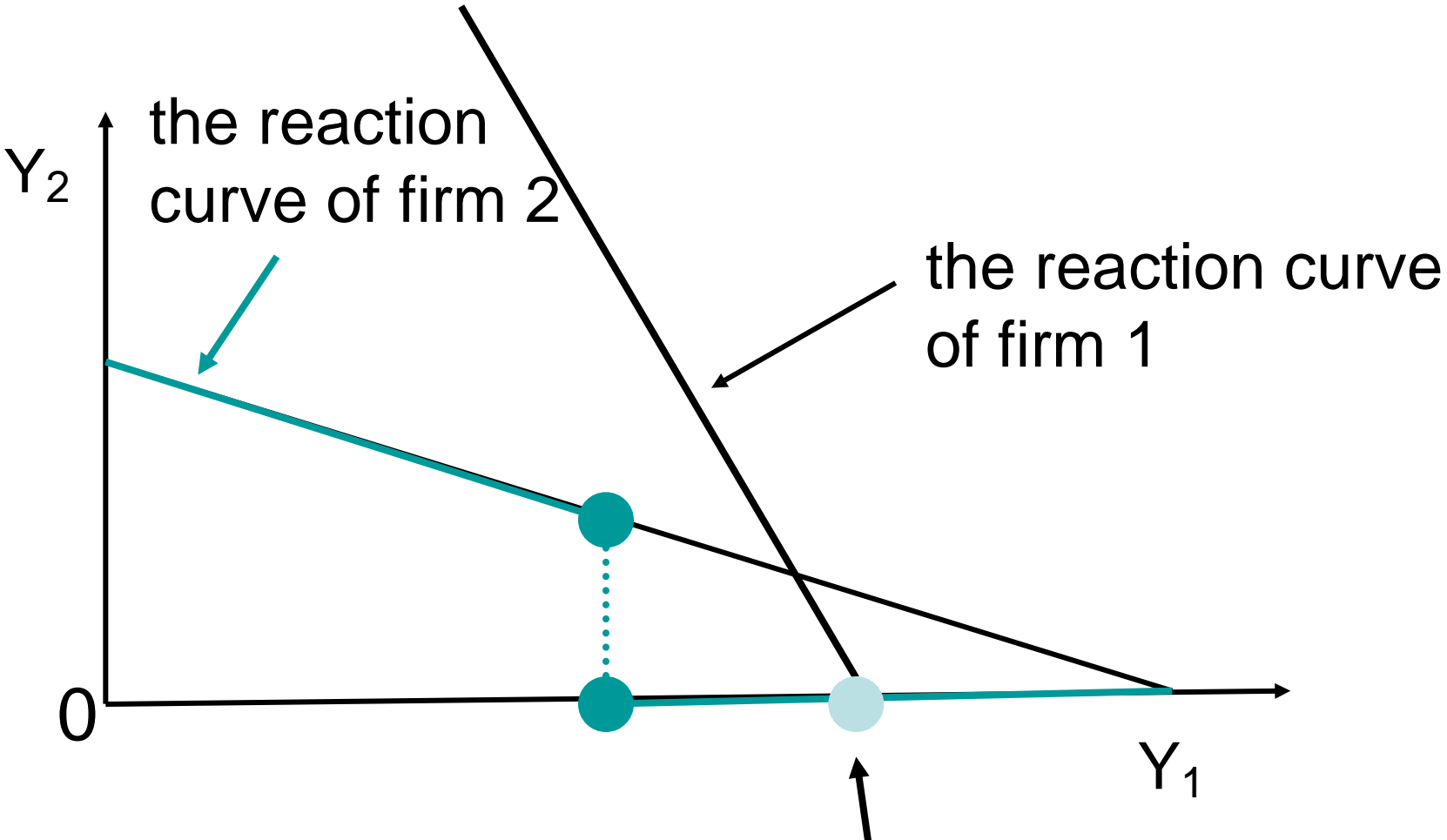


The entry cost have already been sunk.

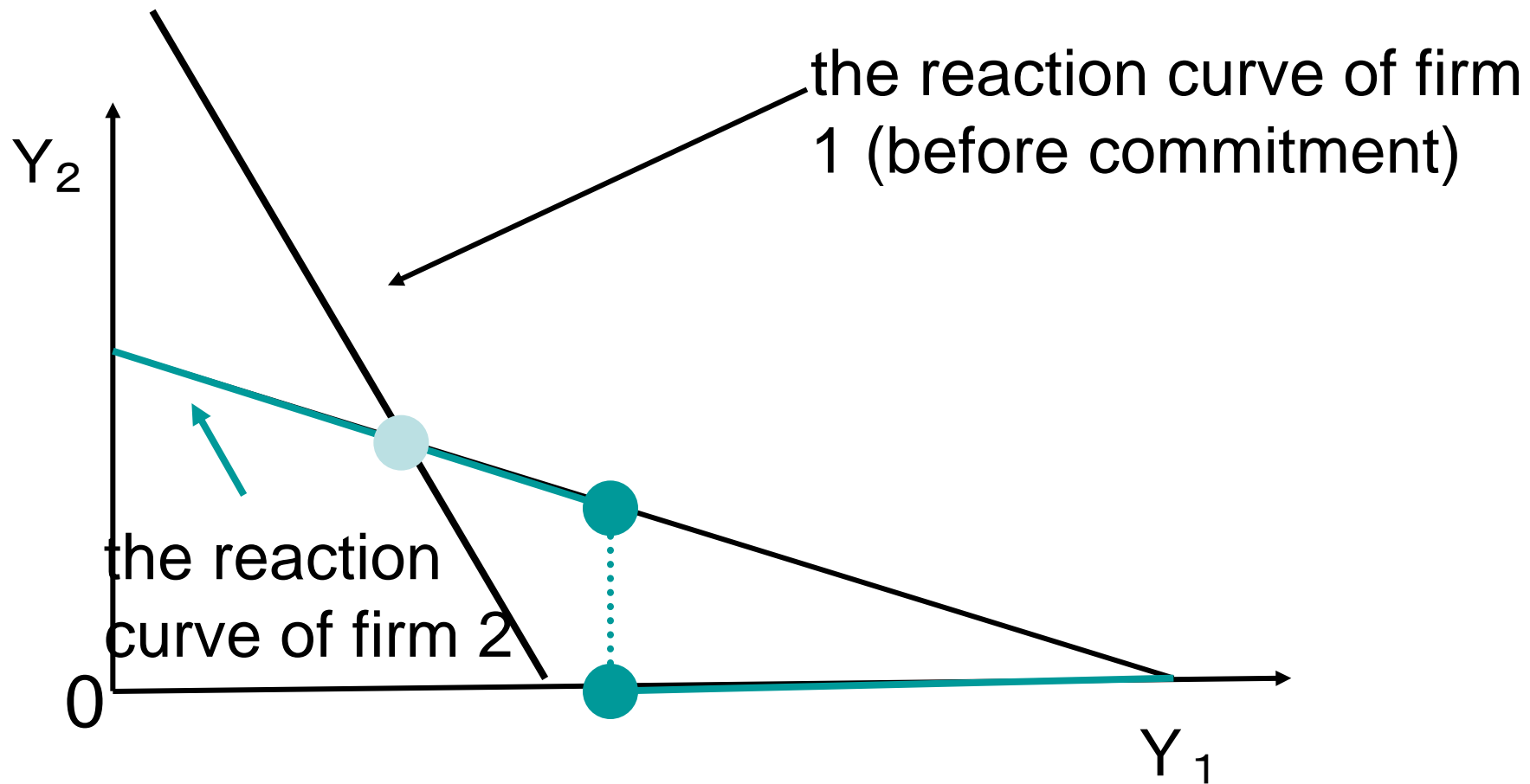
the reaction curve of the new entrant (after the entry)



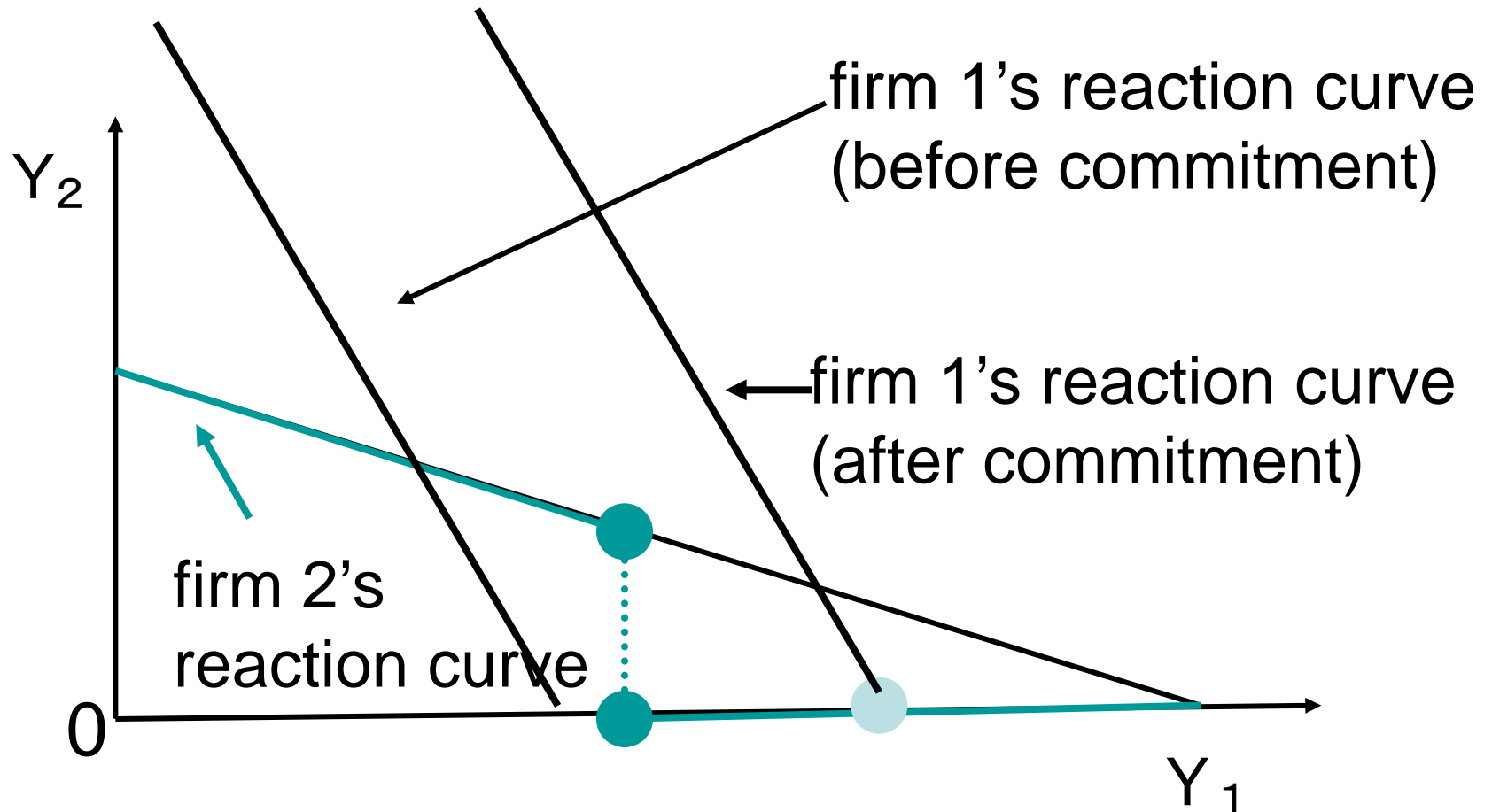
Entry Brock



Entry Deterrence



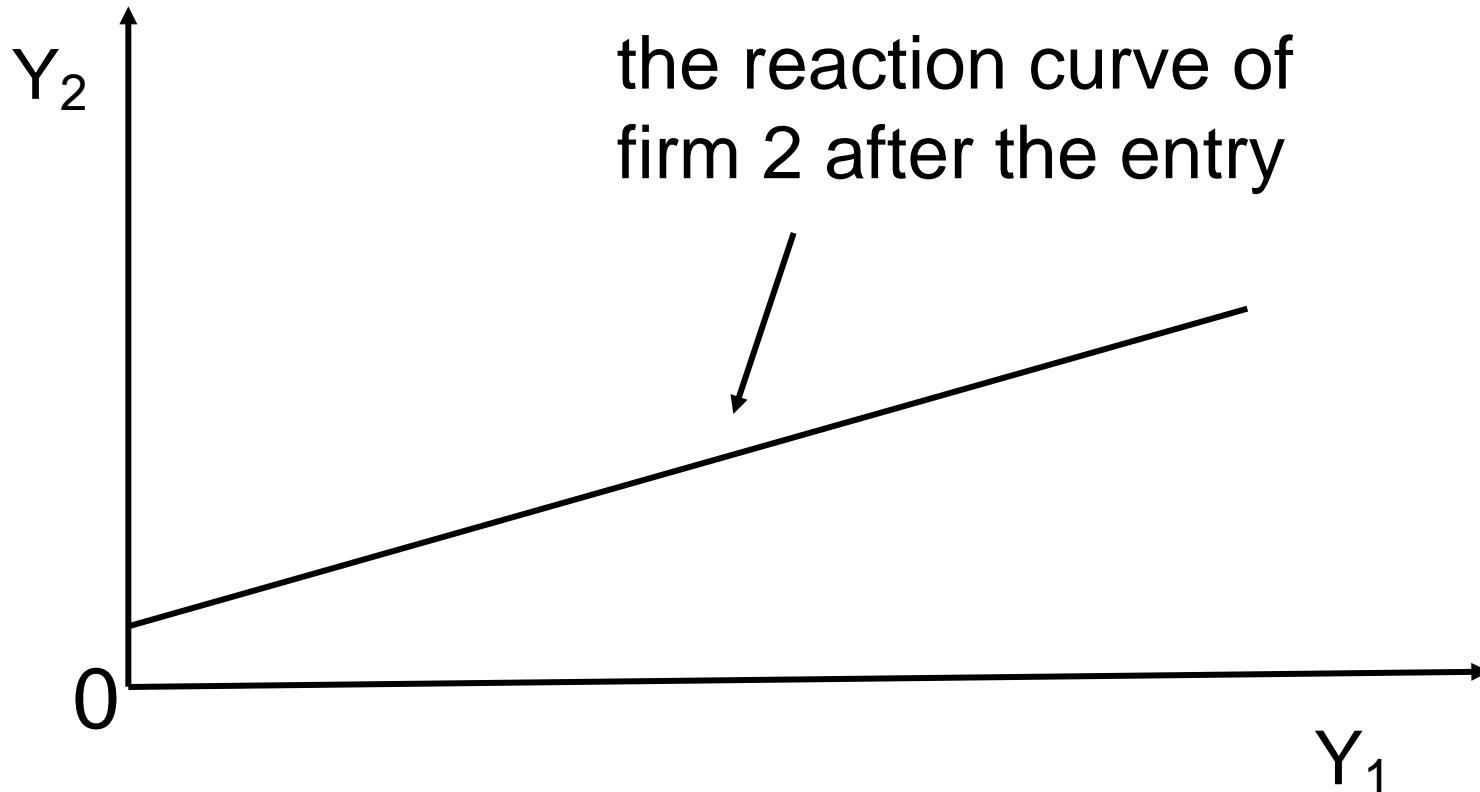
Entry Deterrence



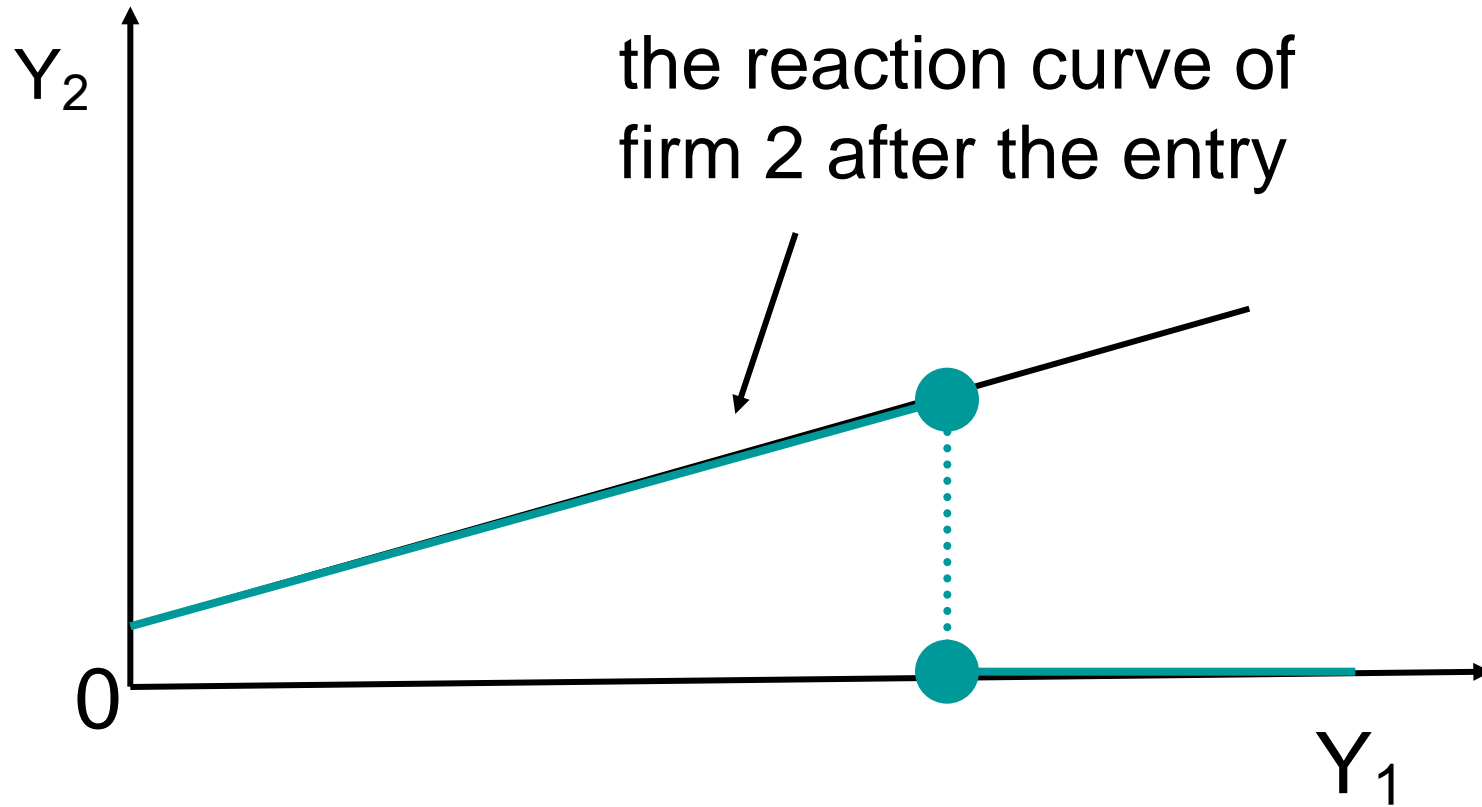
Entry Deterrence

All the devices of strategic commitment discussed in 7th lecture serve as the instruments of entry deterrence.

The case of strategic complement



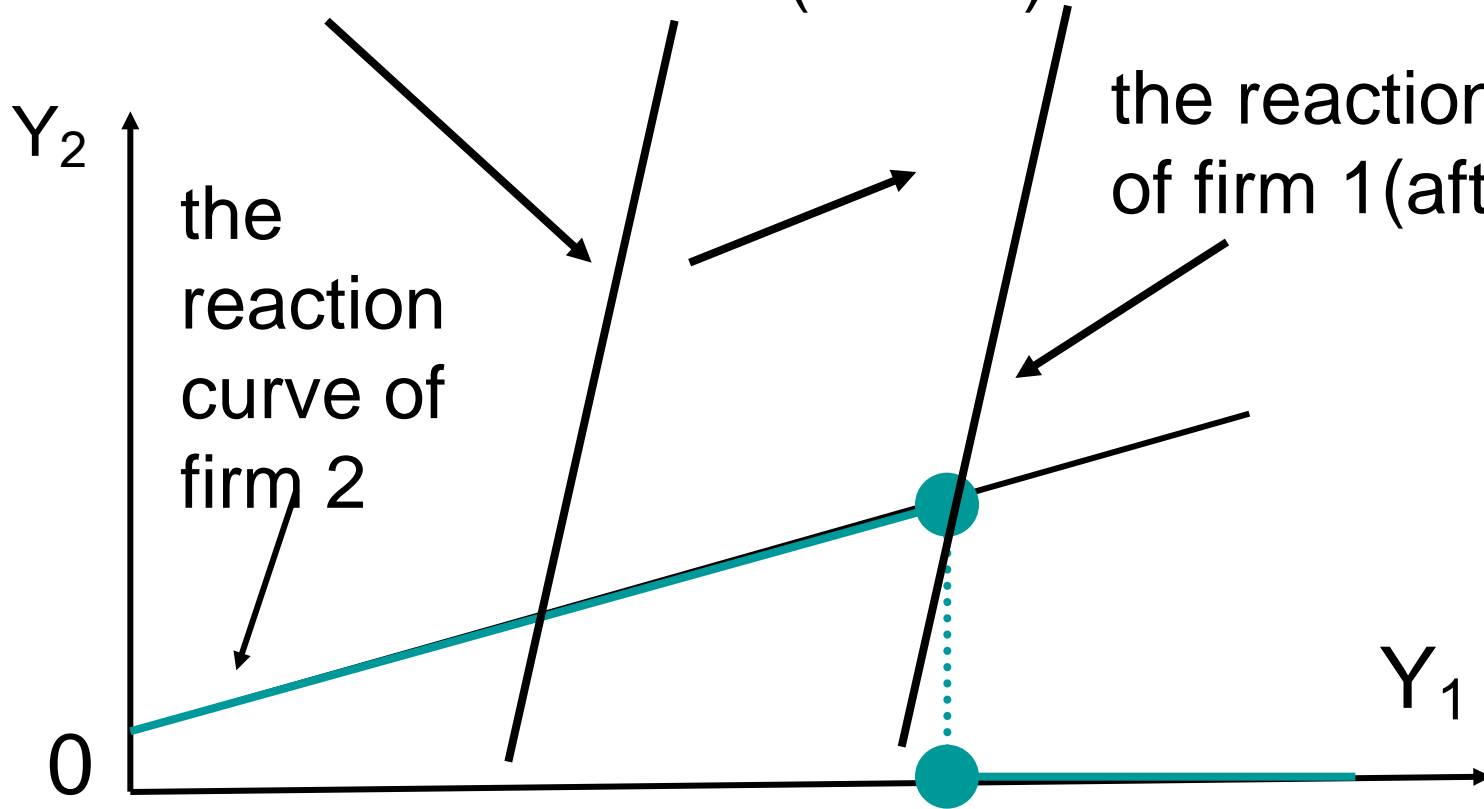
The case of strategic complement



Entry Deterrence

the reaction curve of firm 1 (before)

the reaction curve of firm 1 (after)

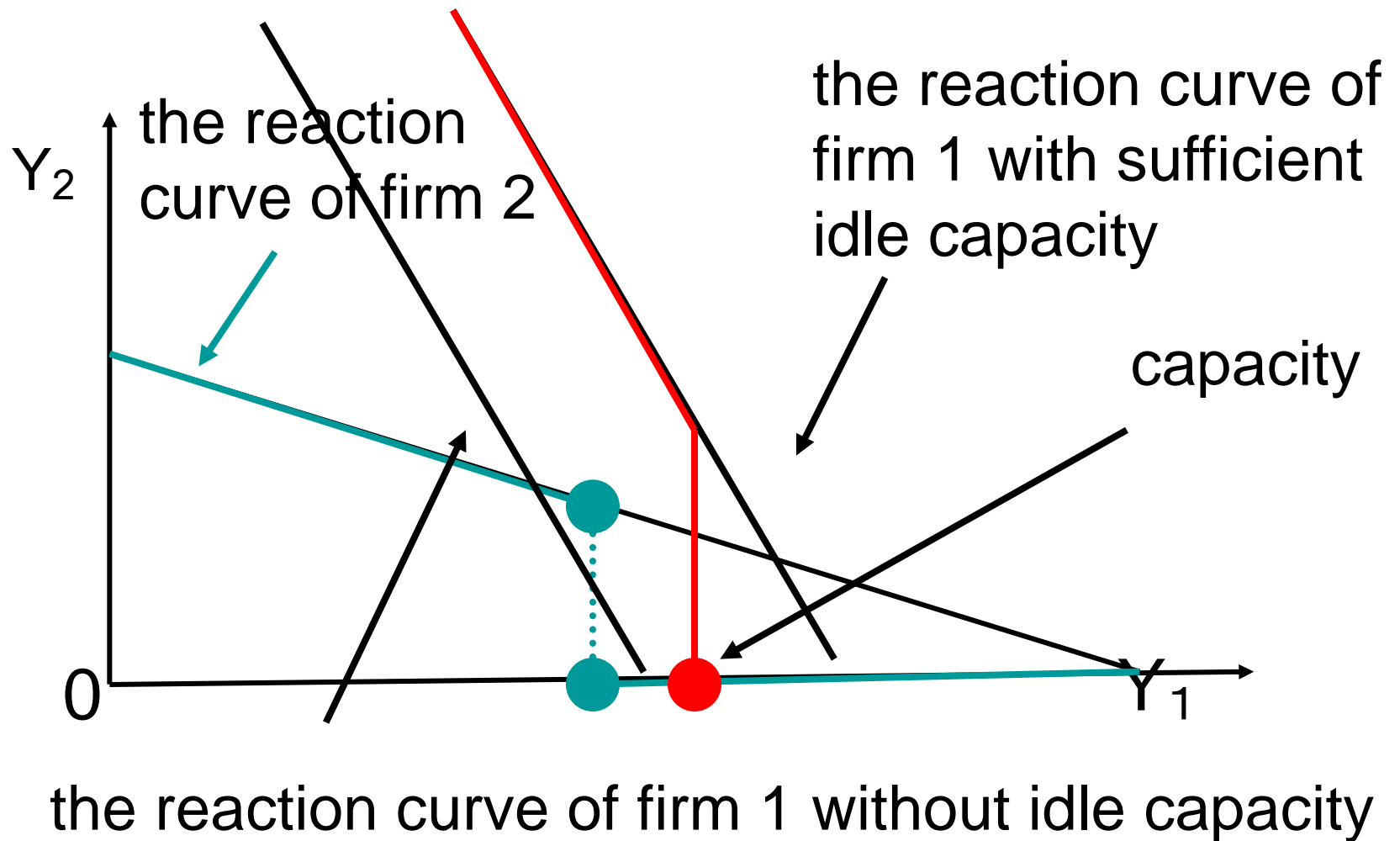


In contrast to the cases discussed in 7th lecture, the incumbent commit to more aggressive behavior.

Entry Deterrence by Capacity Investment

Firm 1's marginal cost is c if it has sufficient capacity.
Firm 1's marginal cost is $c + k$ if the capacity is insufficient (production level exceeds the existing capacity level).

Capacity Investment



Inventory Investments

The inventory the incumbent must sell in the next period ~ the same commitment value of capacity
⇒ 6th lecture, two-production period model

multi period case

rapidly obsolete products and high costs of inventory holding increase the commitment value of inventory holding

Limit Pricing

Suppose that the incumbent names a lower price (chooses a larger output) than profit-maximizing level.

→ The new entrant thinks that the incumbent again chooses a lower price (a higher output) and hesitates to enter the market.

⇒ So as to deter the entry, the incumbent dare name a lower price than the monopoly price. ~ Limit Pricing

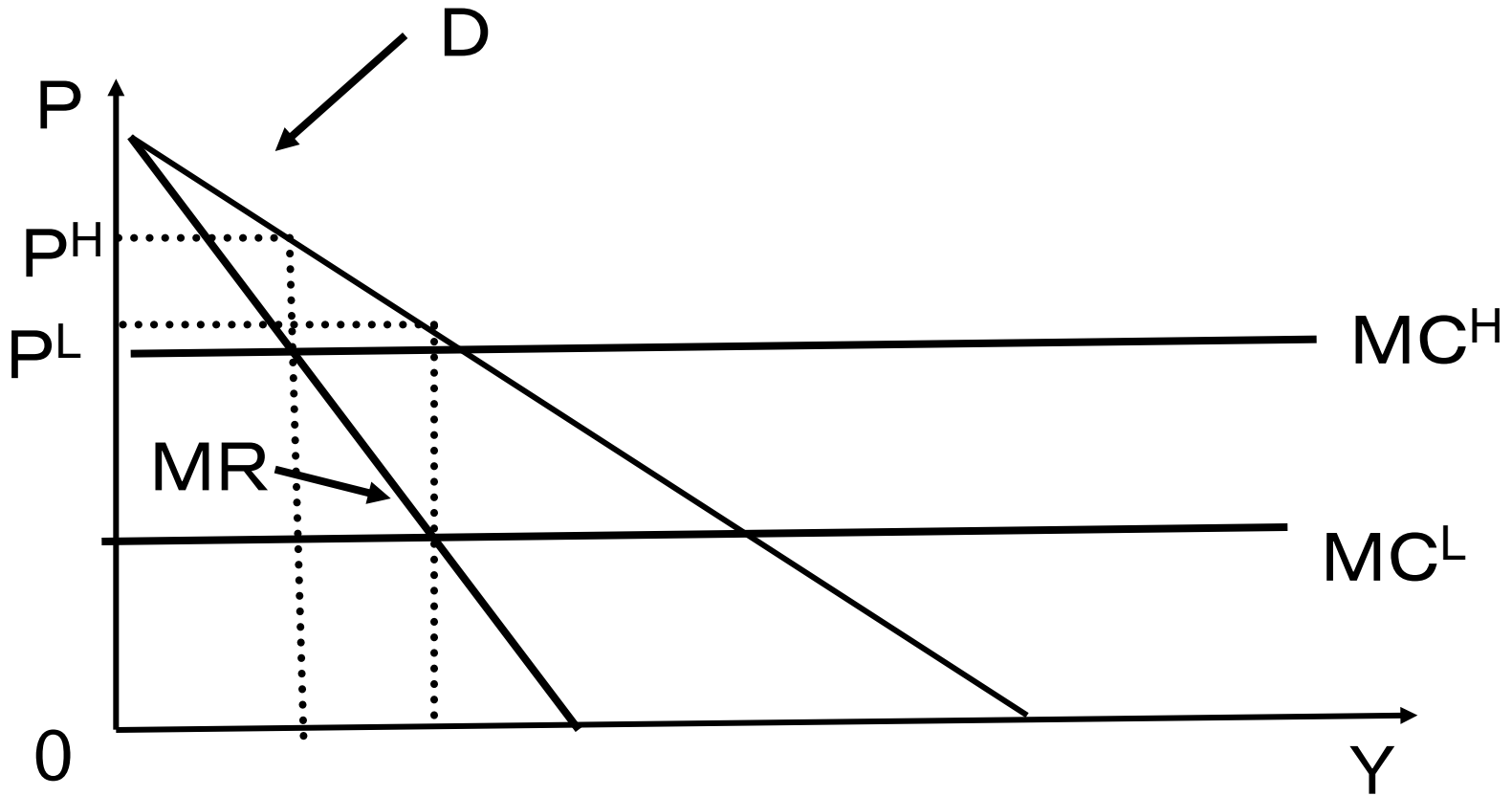
This discussion is curious. Today's low price does not imply the future low price. Today's low price must be the empty threat.

Signaling and Limit Pricing

Private information on the incumbent's cost

The incumbent (firm 1) knows its own cost but the rival does not know it. The new entrant (firm 2) gives up entering the market if the incumbent's cost is low, while enters the market if the incumbent's cost is high. In period 1 firm 1 names the price. In period 2, after observing the price of firm 1 in period 1, firm 2 chooses whether to enter the market. After the entry, firm 2 knows the cost of firm 1.

Monopoly



Signaling and Limit Pricing

High Cost Type ~ It has an incentive for making the rival misunderstand that it is Low Cost Type.

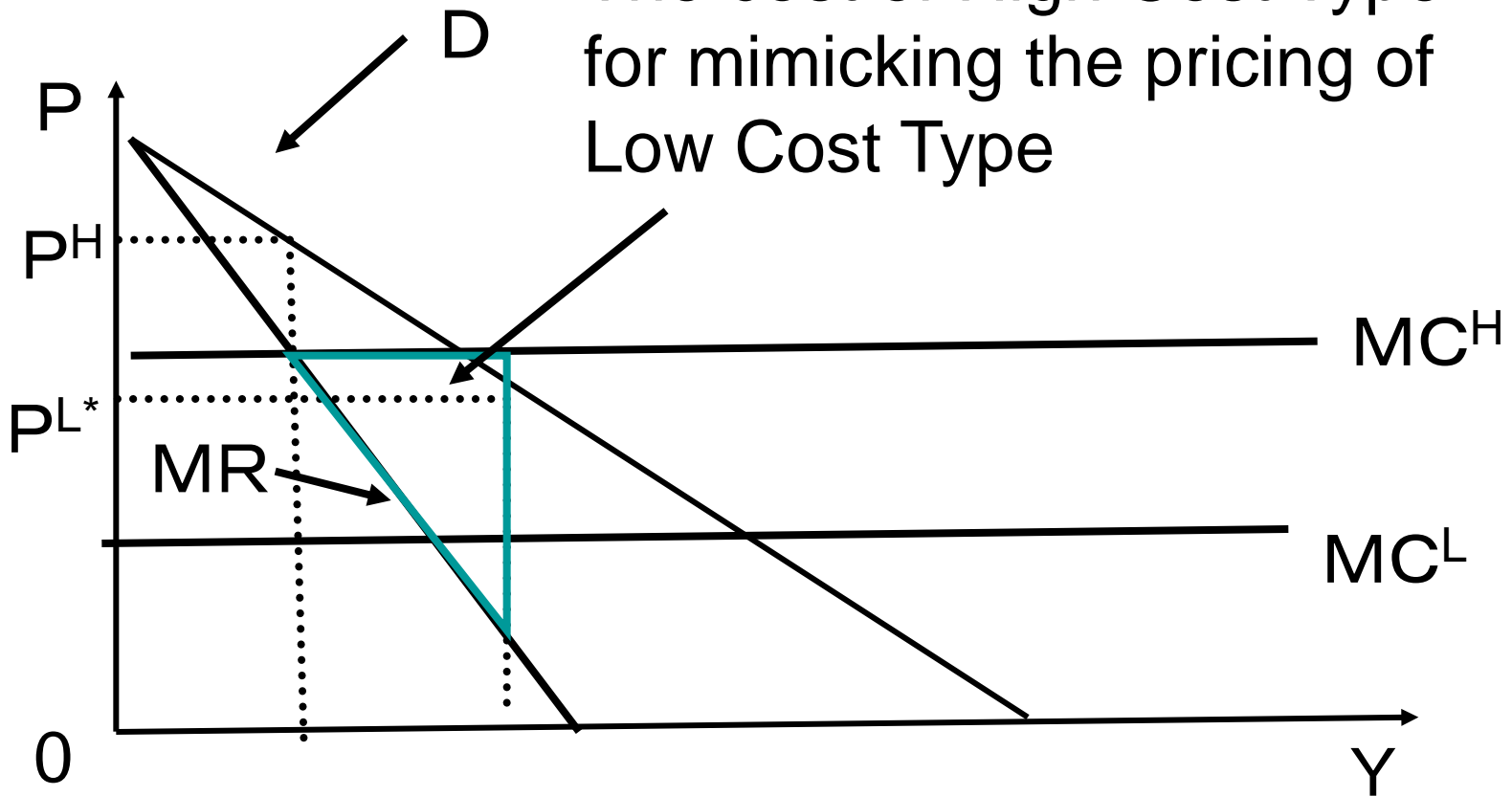
Low Cost Type ~ It has an incentive for making the rival understand that it is Low Cost Type. In period 1 it names the sufficiently low price such that the High Cost Type loses the incentive to mimic the behavior of Low Cost Firm

⇒ Separating Equilibrium

The Behavior of Low Cost Type at the separating equilibrium is similar to 'Limit Pricing'.

Monopoly

The cost of High Cost Type for mimicking the pricing of Low Cost Type



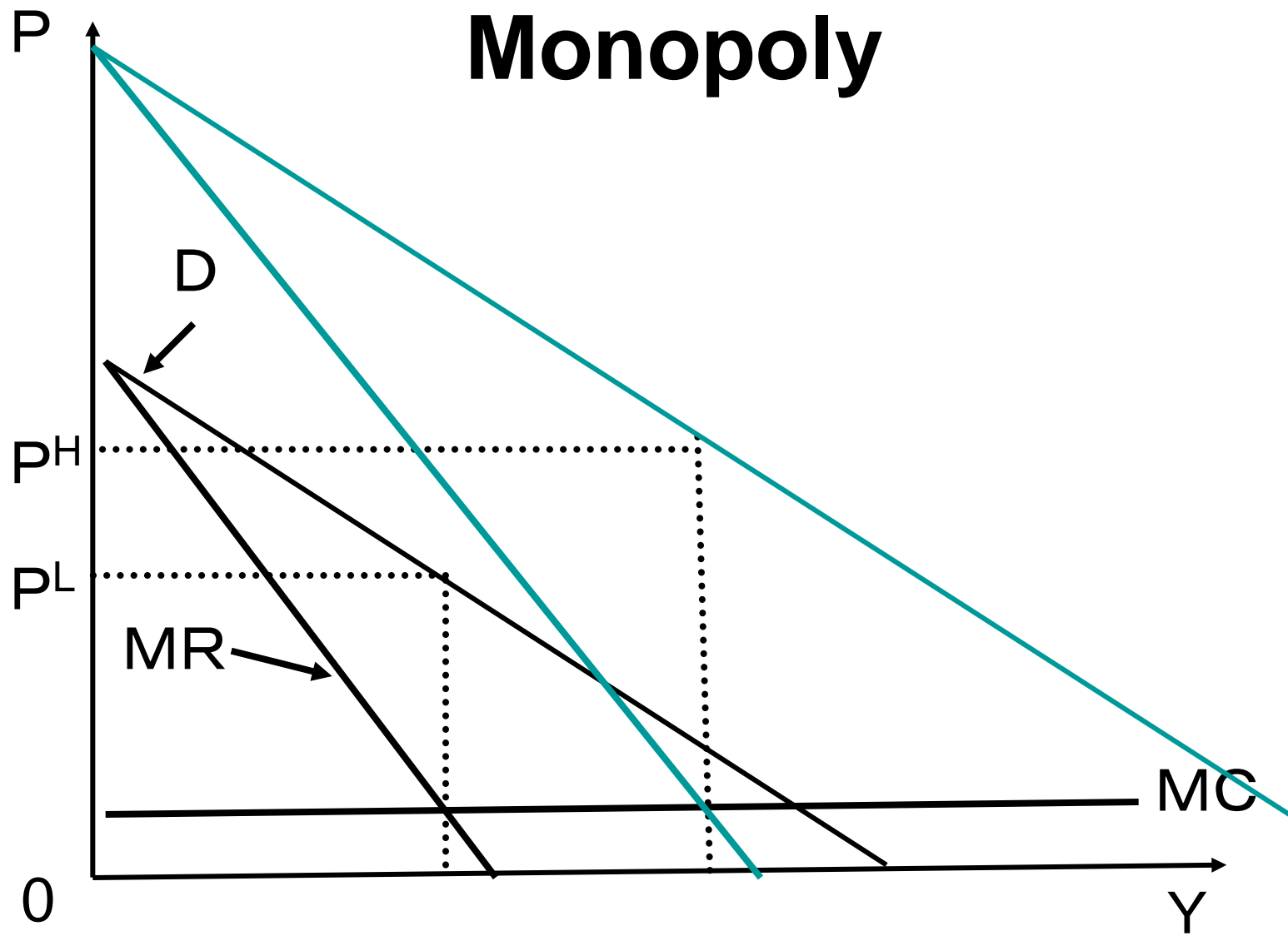
Signaling and Limit Pricing

Private information on the demand condition

The incumbent (firm 1) knows the demand parameter but the rival does not know it. The new entrant (firm 2) gives up entering the market if the demand is small, while enters the market if the demand is large.

In period 1 firm 1 names the price. In period 2, after observing the price of firm 1 in period 1, firm 2 chooses whether to enter the market. After the entry, firm 2 knows the demand condition.

Monopoly



Signaling and Limit Pricing

High Demand Type ~ It has an incentive for making the rival misunderstand that it is Low Demand Type.

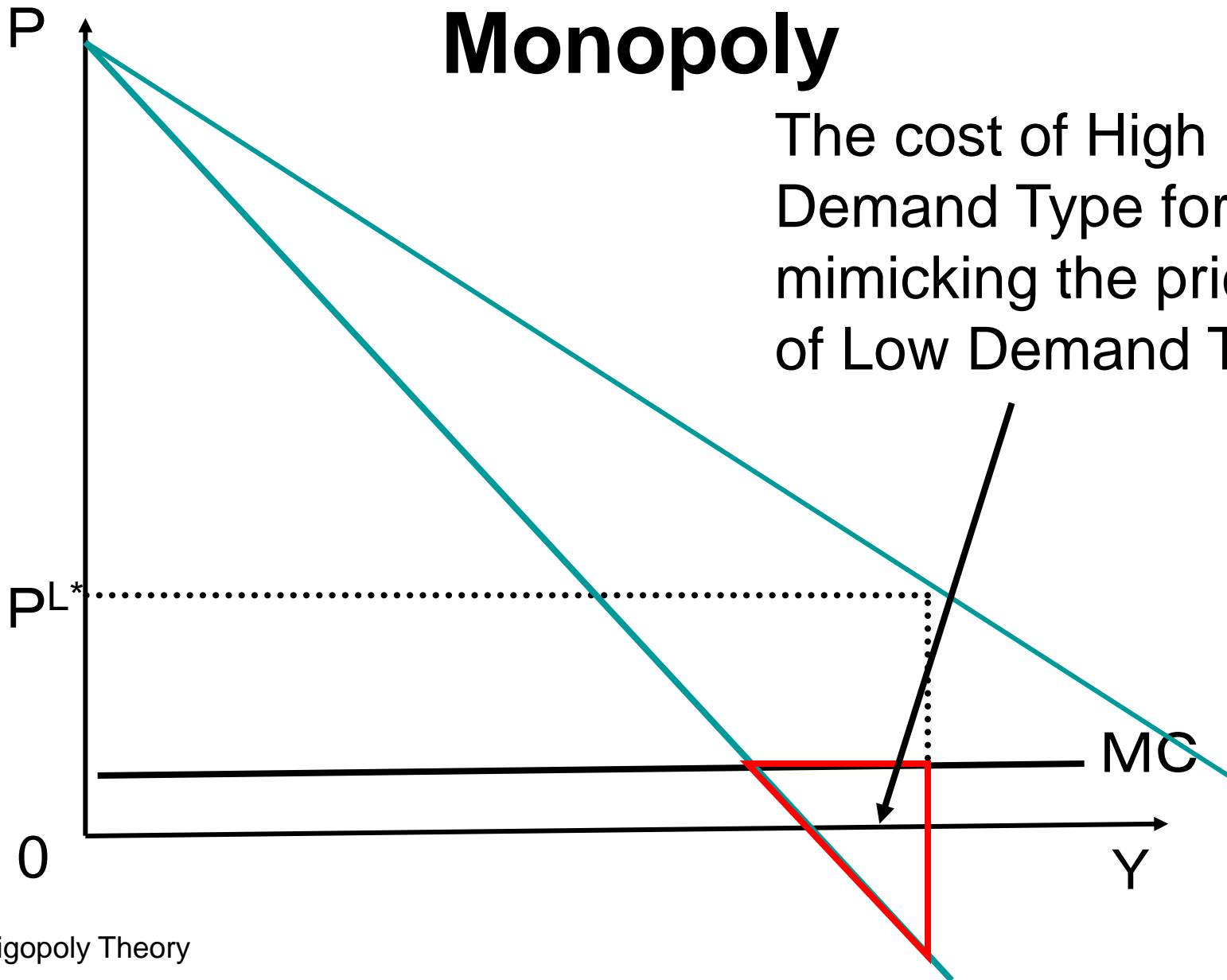
Low Cost Type ~ It has an incentive for making the rival understand that it is Low Demand Type. In period 1 it names the sufficiently low price such that the High Demand Type loses the incentive to mimic the behavior of Low Demand Firm.

⇒ Separating Equilibrium

The Behavior of Low Cost Type at the separating equilibrium is similar to 'Limit Pricing'.

Monopoly

The cost of High Demand Type for mimicking the pricing of Low Demand Type



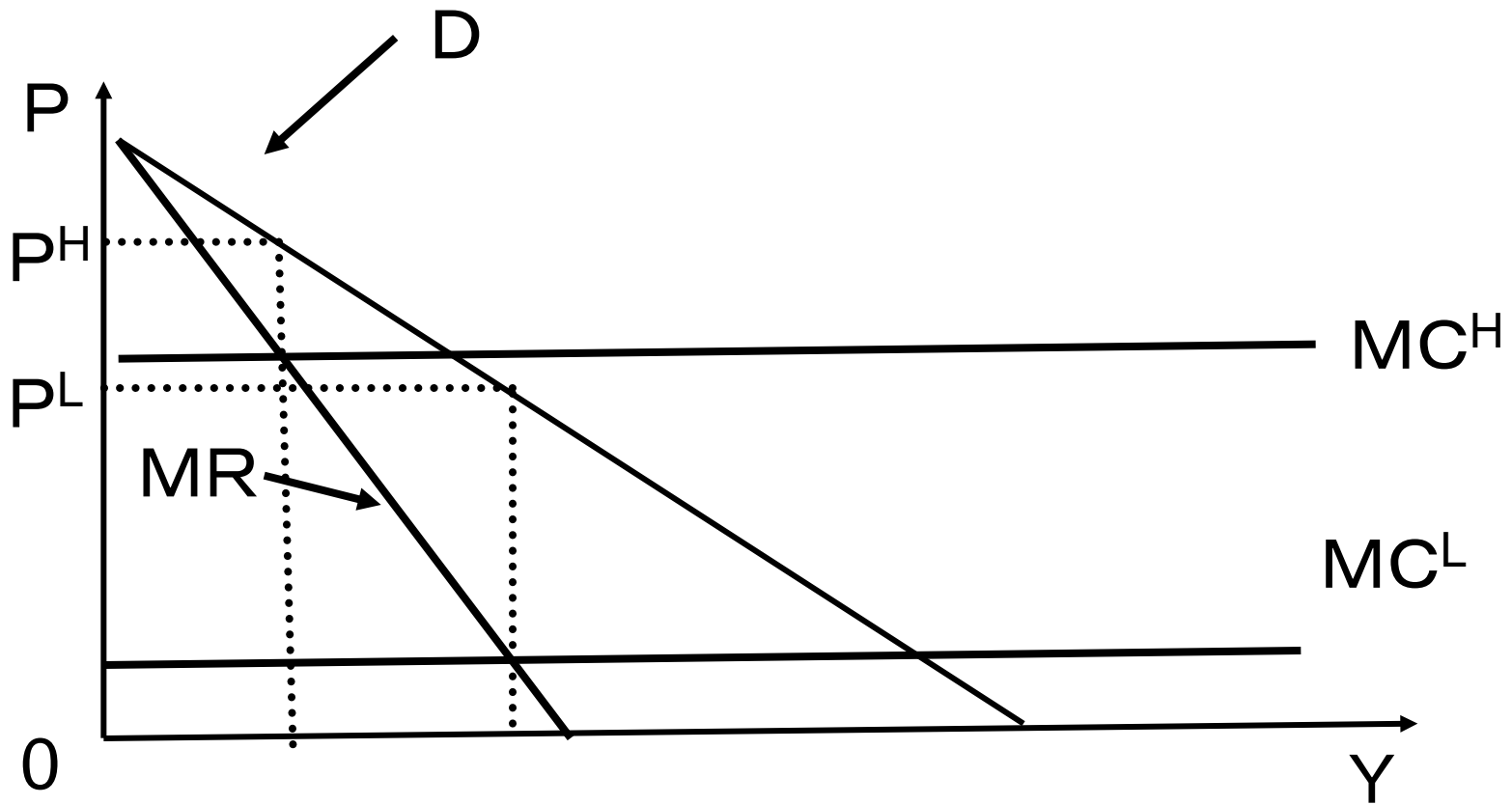
Signaling and Limit Pricing

Private information on the common cost

The incumbent (firm 1) knows the common cost between firm 1 and firm 2, but the rival does not know it. The new entrant (firm 2) gives up entering the market if the cost is high, while enters the market if the cost is low.

In period 1 firm 1 names the price. In period 2, after observing the price of firm 1 in period 1, firm 2 chooses whether to enter the market. After the entry, firm 2 knows the cost condition.

Monopoly



Signaling and Limit Pricing

Low Cost Type ~ It has an incentive for making the rival misunderstand that it is High Cost Type.

High Cost Type ~ It has an incentive for making the rival understand that it is High Cost Type. In period 1 it names the sufficiently high price such that the Low Cost Type loses the incentive to mimic the behavior of High Cost Firm

⇒ Separating Equilibrium

The Behavior of High Cost Type at the separating equilibrium is the opposite to the 'Limit Pricing'.

Entry Deterrence and Multi-Store Paradox

Market Pre-Emption and Entry Deterrence

Why do firms produce various products which are mutually substitute ?

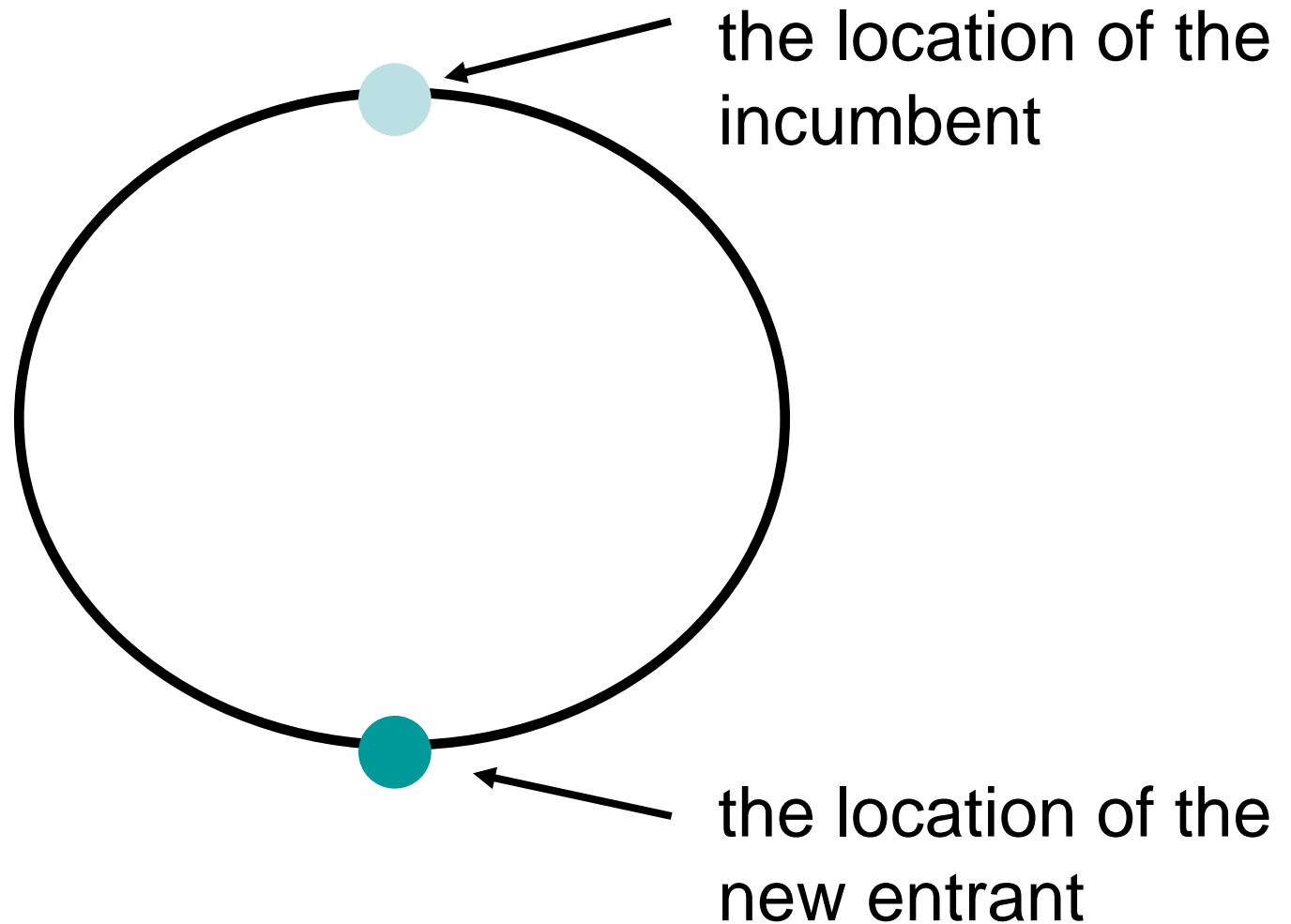
Instant noodles, chicken, curry, sea food, Italian..

~ Introducing a new product reduces the demand of its own existing products.

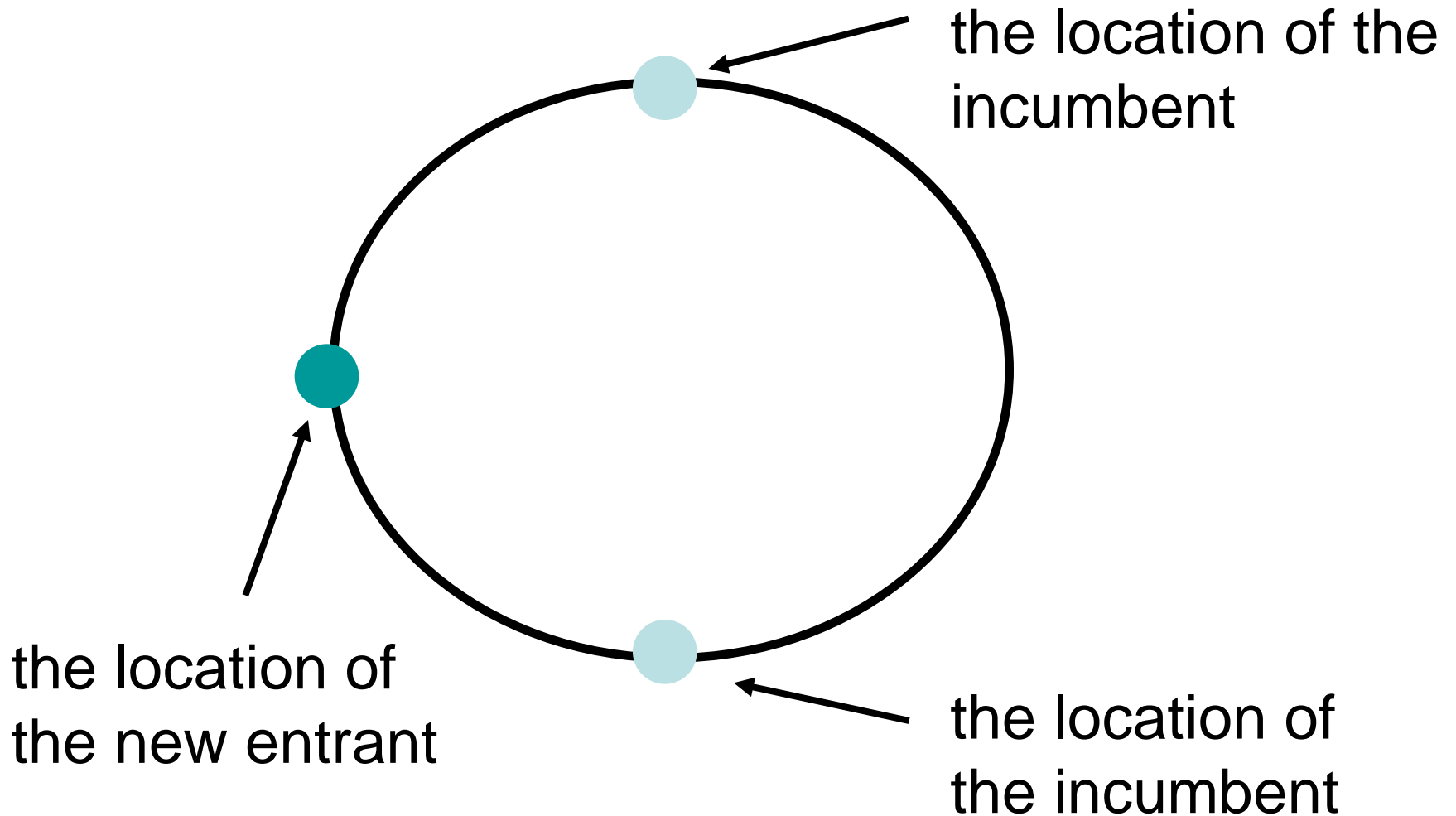
An answer

⇒ to deter the entry of the rival ~ market pre-empting

Spatial Pre-Emption



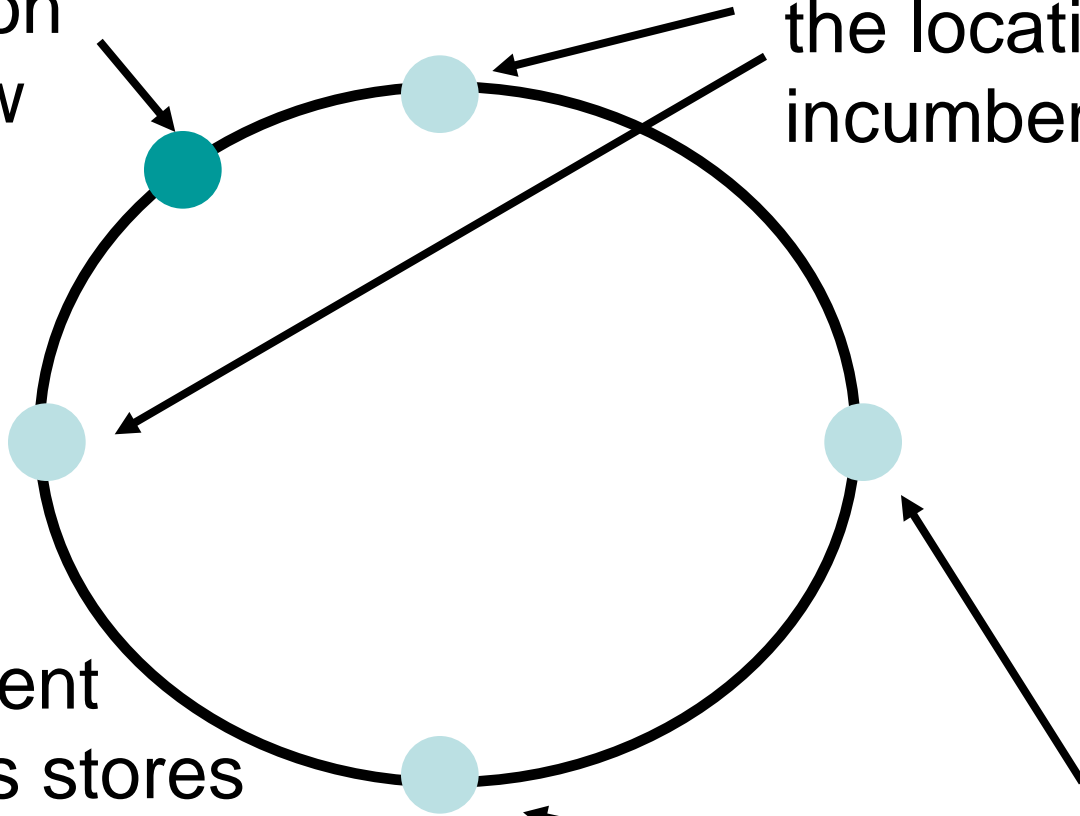
Spatial Pre-Emption



Spatial Pre-Emption

the location
of the new
entrant

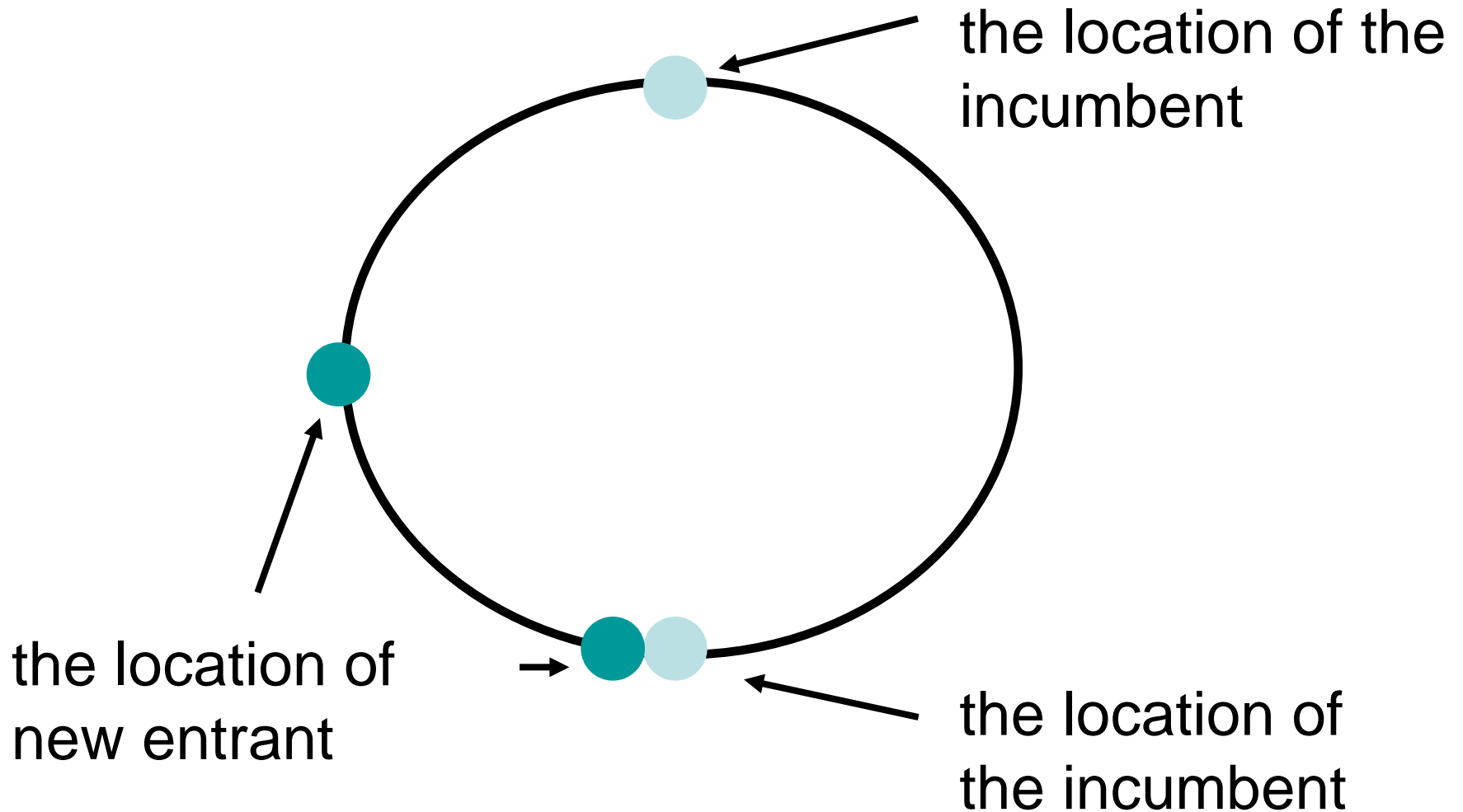
the locations of the
incumbent



The incumbent
increases its stores
until the new entrant
gives up the entry

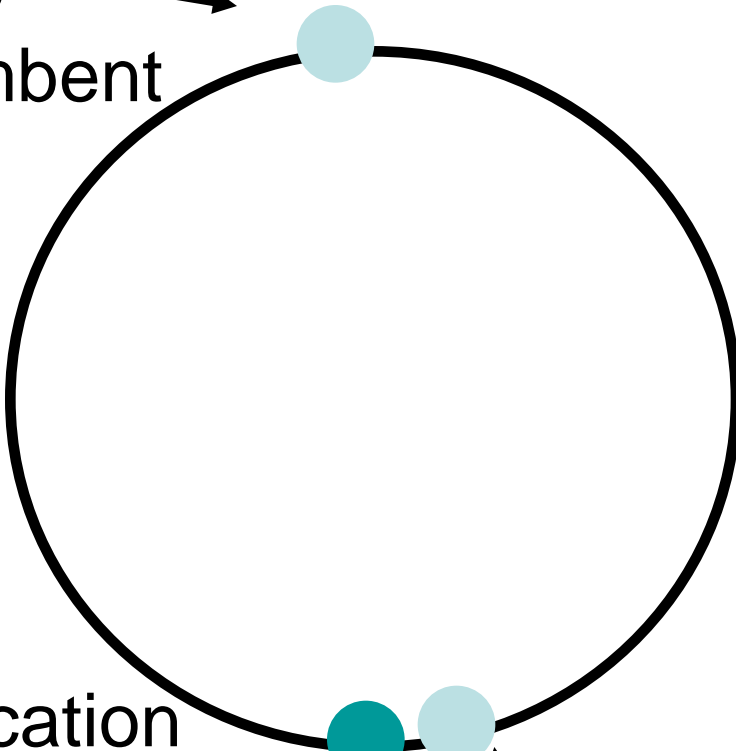
the locations of
the incumbent

Judd (1990)



Judd (1990)

the store 1
of the
incumbent



the location
of the new
entrant

store 2 of the
incumbent

new entrant locates at the
same place as the
incumbent's store 2.

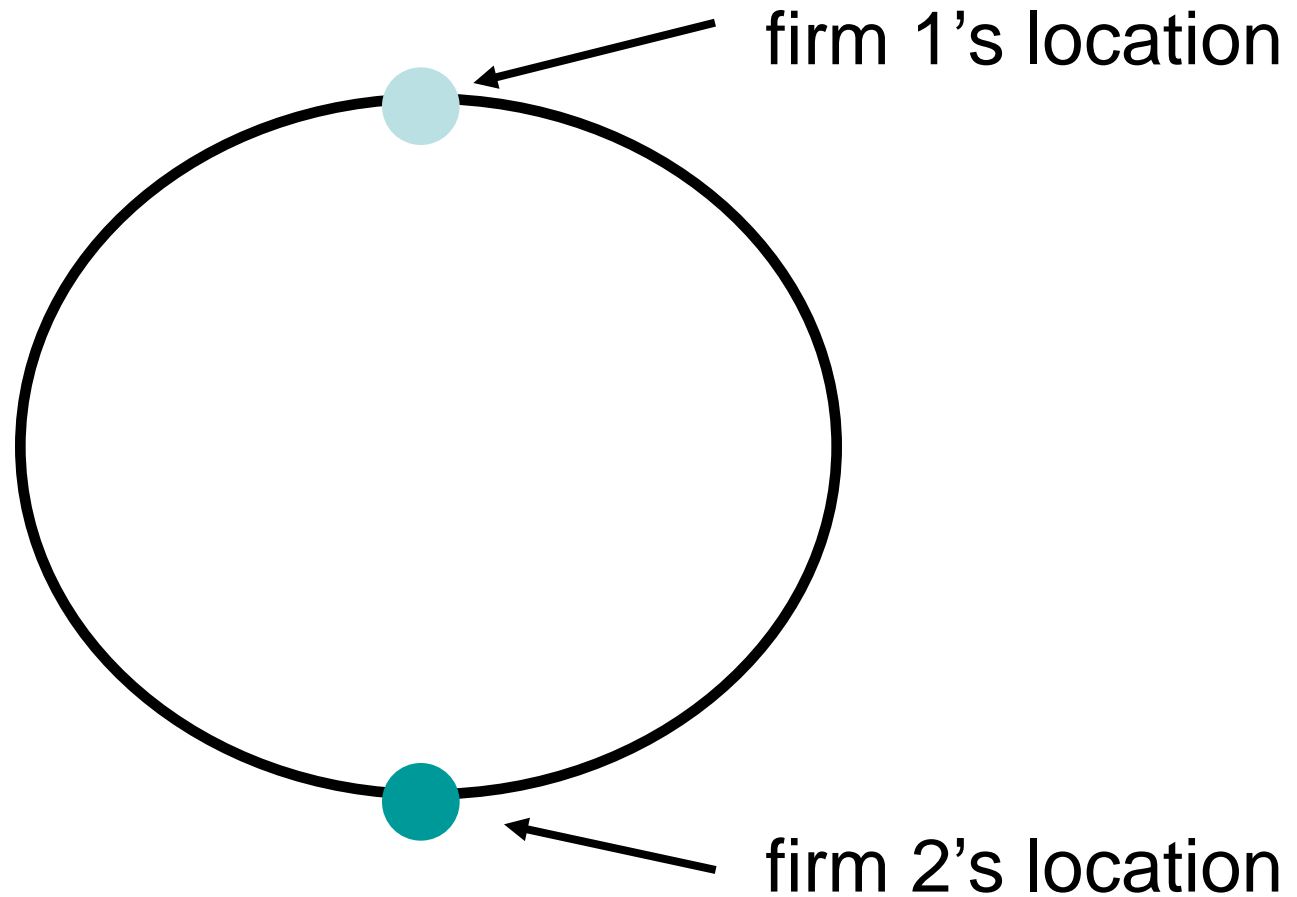
→ Bertrand competition
yields zero profit from
store 2.

→ The low price by the
new entrant reduces the
profits of store 1

→ to avoid this
competition, the
incumbent withdraws
store 2 even when it
cannot recover the sunk
cost of building store 2³⁵

Maximal Differentiation and Multi-Store Paradox

Salop (1979)



Suppose that each duopolist builds one store.

Martinez-Giralt and Neven (1988)

