Monopolistic Competition and Oligopoly

Monopolistic Competition (獨占性競爭)

An introduction to Oligopoly (寡占)

Models of Oligopoly

Characteristics of Monopolistic Competition

- **Many producers offer products:**
  - **close substitutes but not identical**
- **Supplier has power over price**
  - **Price makers**
- **Low barriers to enter**
  - **In the long run can enter/leave**
- **Sellers act independently of each other**

Product Differentiation

- In perfect competition, product is homogenous
- In Monopolistic competition, Sellers differentiate products in four basic ways
  - Physical differences and qualities
    - Shampoo: size, color, focus normal (dry) hair …
  - Location
    - The number of variety of locations
      - Shopping mall: cheap, variety of goods
      - Convenience stores: convenience
  - Accompanying services
    - Ex: Product demonstration, money back/no return
  - Product image
    - Ex: High quality, natural ingredients …

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Short-Run Profit Maximization or Loss Minimization

- Because products are different
  - Each firm has some control over price
  - demand curve slopes downward
- Many firms sell close substitutes,
  - Raises price → lose customers
  - Demand is more elastic than monopolist's
  - but less elastic than a perfect competitors

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Price Elasticity of Demand

- **The elasticity demand depends on**
  - **The number of rival firms that produce similar products**
  - **The firm's ability to differentiate its product**
  - **more elastic: if more competing firms**
  - **Less elastic: differentiated product**

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Profit Maximization as MR=MC

- **The downward-sloping demand curve**
  - **MR curve**
    - **slopes downward and**
    - **below the demand curve**
- **Cost curves are similar to those developed before**
- **Next slide depicts the relevant curves for the monopolistic competitor**

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Profit Maximization

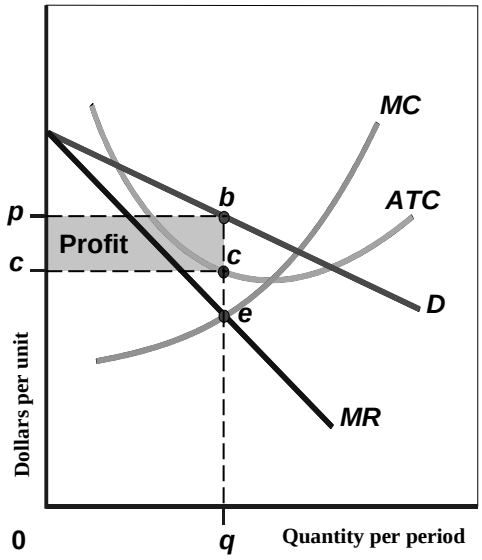
In the short run,
if revenue >variable cost
Profits are max. as MR=MC. This occurs at point *e*.

The market price: point *b*.
Average total cost: *c*

Price – ATC = Profit per unit

Profit= quantity* Profit per unit shown by the blue shaded rectangle.

The monopolistic competitor, like the monopolist, has no supply curve



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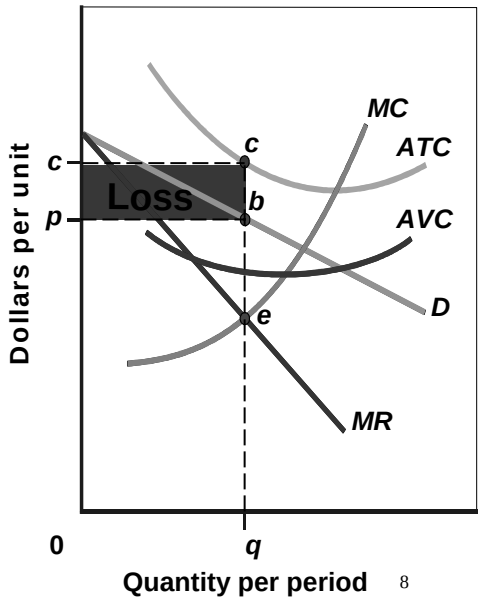
Loss Minimization

ATC curve is above the demand curve
➔All quantities result in losses
➔ Shut down temporarily or Go on?

In the short run,
If price>AVC ➔ go on.
otherwise ➔shut down

To minimize loss,
Produce *q* and charge *p*.
The loss is shown by the *red shaded area*.



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Zero Economic Profit in the Long Run

- **Low barriers to entry in monopolistic competition**
  - **→economic profit attracts new entrants in the long run**
- **New entrants offer similar products**
  - **Draw customers away from existing firms**
  - **Demand for each firm declines and becomes more elastic**
    - **more substitutes for each firm's product**

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Zero Economic Profit in the Long Run

- **In the long run, monopolistically competitive firms earn zero economic profit**
- **In the cases of losses**
  - **Some monopolistic competitors leave**
  - **Customers will switch to the remaining firms**
  - **Increasing the demand making it less elastic**
- **Long-run equilibrium is illustrated in next slide.**

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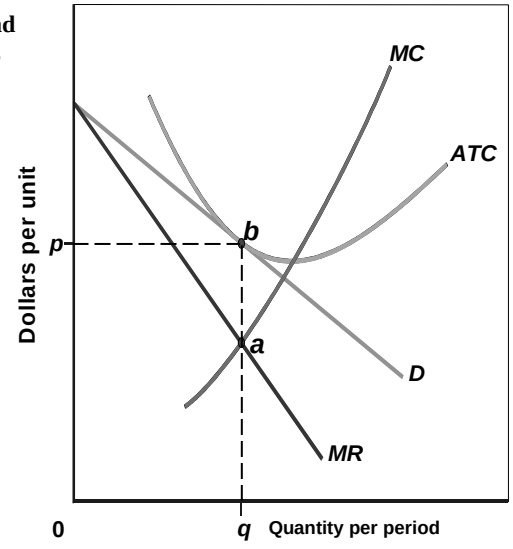
Long-run Equilibrium

Entry and exit shift each firm's demand curve until economic profit disappears
Price =ATC

MR=MC at point *a*
→equilibrium *q*,
Average total cost curve is tangent to the demand curve at point *b* → no economic profit.



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Compare the Efficiency between monopolistic and perfect competition

- **In the long run, neither can earn economic profit**
- **Difference: different demand curves**
  - **Perfect competition: flat**
  - **Monopolistic competition: downward slope**
- **See next slide for comparison**

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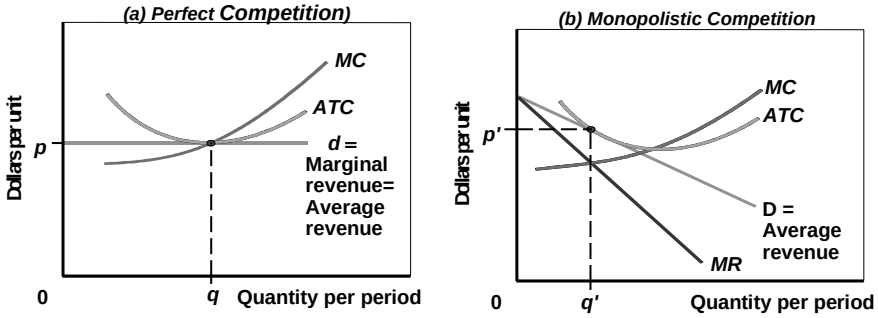
Monopolistic Competition Versus Perfect Competition



Assuming that two firms have identical cost curves.
MC=MR at the quantity where ATC curve is tangent to the demand curve.

In perfect competition, the firm produces at the lowest possible average cost in the long run.

In monopolistic competition, the price and average cost p' > p.

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Comparison

- **Firms in monopolistic competition have excess capacity,**
  - **Production is lower than the rate associated with the lowest average cost**
- ***excess capacity:* Producer can produce more and lower ATC**
  - **marginal value (denoted by demand)> MC (of the firm)**
  - **Increase output would increase economic welfare**

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Comparison

- **Firms in monopolistic competition spend more on advertising and other promotional expenses to differentiate their products**
  - **These costs shift up their average cost curves**
- **Arguments in monopolistic competition:**
  - **Too many suppliers and in product differentiation that is often artificial**
- **Counterargument**
  - **Consumers are willing to pay a higher price for greater selection**
  - **Benefit from the wider choice**

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Oligopoly

- ***Oligopoly*** **: a market dominated by just a few firms**
  - **Each must consider the effect of its own actions on competitors' behavior ➔ the firms in an oligopoly are *interdependent***
- **There are a variety of oligopolies**

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Varieties of Oligopoly

- **The product can be homogeneous or differentiated across producers**
- **The more homogeneous the products, the greater the interdependence among the firms**
- **Products can be differentiated:**
  - **physical qualities**
  - **sales locations**
  - **services**
  - **image of the product**

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Varieties of Oligopoly

- **The behavior of a firm is difficult to analyze**
  - **Interdependence among firms**
- **Each firm knows that any changes in its policy**
  - **Like product quality, price, or advertising**

  prompt a reaction from its rivals
- **Domination by a few firms**
  - **some form of barrier to entry**

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行銷戰》一隻貓引爆超商夏季促銷戰

- 7-ELEVEN的Hello Kitty引爆超商夏季促銷戰。全家今起推出超商史無前例的「味全商品第3件1元發燒購」，萊爾富則是以第2件6折、2件6-8折的折價券，以及蒐集1式6款的小熊維尼不倒翁等3波段促銷，挑戰萬人迷kitty。

一隻不會說話的「貓」，爲何會引起大規模的折扣戰？

據了解，在Kitty天真的外表下，實則內藏大大的玄機。競爭同業的觀察是，7-ELEVEN這波「滿77元、集Kitty、送折價券」的全店式行銷，表面上是與全民同樂的蒐集活動，其實是折扣下殺到近破盤價的商品促銷。

昔日超商業者的折扣價，頂多做到第2件6折，換算下來即是2件8折。這次7-ELEVEN在隨Kitty磁鐵附贈的各種商品折價券中，不管是可口可樂、白蘭氏雞精、滿漢速食麵或品客洋芋片，2件下殺到6折起的折扣，已跌到破盤價。

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Economies of Scale

- **Most significant entry barrier**
  - **Might be economies of scale**
- **Define: Minimum efficient scale**
  - **Lowest rate of output at which the firm takes full advantage of economies of scale**
  - **See next slide**
- **If minimum efficient scale is relatively large compared to industry output**
  - **Only one or a few firms are needed in the market**

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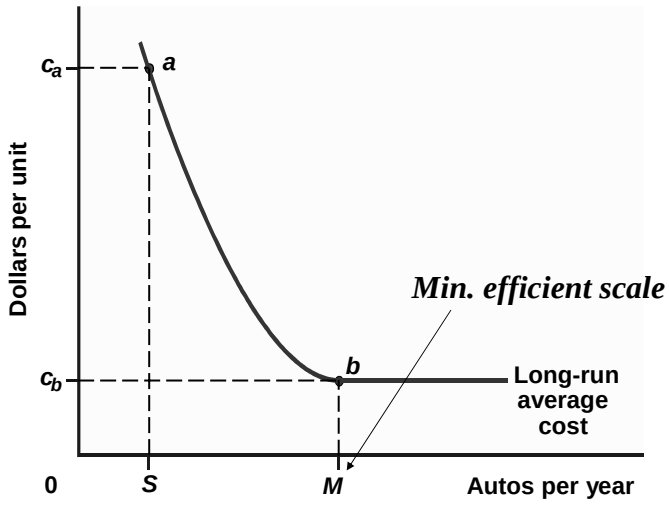
Economies of Scale as a Barrier to Entry

Minimum efficiency scale= *M*.

New entrant sells *S* cars, Average cost =c_a> c_b

A potential entrant lose money if price< c_a.

This discourage entry into the industry.



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High Cost of Entry

- **The investment needed to start up is often large**
  - **Auto plant: 1 billion**
  - **Drug: 300 billion**
  - **Advertising a new product require enormous outlays**
  -
- **High start-up costs and established brand names create substantial barriers to entry**

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High Cost of Entry

- **Product differentiation expenditures create barriers to entry**
- **Offering a variety products**
  - **Dominate the shelf space**
  - **Stocking fee for shelf space**

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上架費

http://www.toybase.com.tw/h/n1020213.html

- 對於玩具供應廠商的業者而言，首先要有一個觀念 ，那就是商品要到各零售通路例如便利超商、超市、量販店、批發倉 儲等業態陳列販售，一定要付出一筆費用，而且這一筆費用會依業態 、依店數多寡而有所不同，不過大抵上各家業者都有訂定出一定的收 費標準、計算方式來供所有廠商參考。也因爲如此，供應廠商在計價 或核算通路成本時，才有一個依據參考，更不至於吃虧，而且所有的 合作條件都必須是雙方簽署的，付錢上架雙方必須履行義務，日後交 易才有保障。

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Models of Oligopolies

- **The interdependence of firms makes analyzing complicated**
  - **No unique model or approach**
- **At one extreme, all the firms coordinate their behavior so they act collectively as a single monopolist, forming a cartel (聯合,勾結)**
- **At the other extreme, they may compete crudely that price wars erupt**

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Models of Oligopoly

- **Three better-known approaches are introduced**
  - **Collusion**
  - **Price Leadership**
  - **Game Theory**
- **None is entirely satisfactory as a general theory**
  - **Each is based on the diversity of observed behavior in an interdependent market**

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Collusion

- ***Collusion*** **is an agreement among firms to divide the market and fix the price**
- **A *cartel* is a group of firms that agree to collude**
  - **Act as a monopolist**
  - **Earn monopoly profits**
- **Usually**
  - **reduce output,**
  - **increase price,**
  - **block the entry of new firms**

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Collusion

- **Collusion and cartels are illegal in the United States; some other countries are more tolerant and some countries even promote cartels ➔ OPEC (**石油輸出國家組織 **)**
- **Next slide illustrates the impact of firms colluding and forming a cartel**

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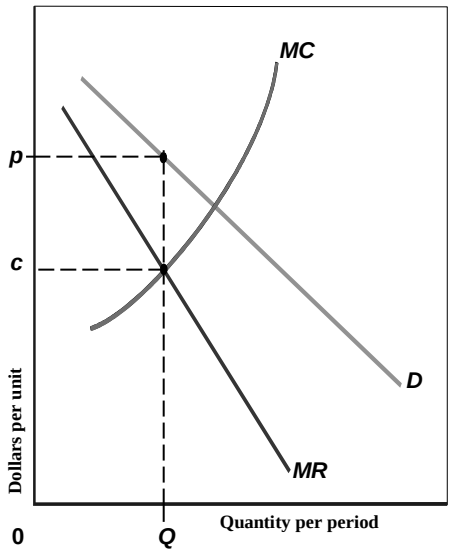
Cartel Model

The two key issues:
•What price will maximize the cartel's profit
•how to allocate production among firms?

The MC curve for cartel is the horizontal sum of the MC curves of all firms

Profit maximization occurs as MR=MC.
Price= *p*
Quantity=*Q*,
MC=*c*.

There is no curve that uniquely relates price and quantity supplied. → No supply curve



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Cartel Model

- **To maximize profit, output are allocated so that the MC for the final unit produced by each firm is identical**
- **Any other allocation would lower cartel profits**
- **However, this is much easier said than done in practice**
  - **Different costs among firms**
  - **Number of firms in the cartel**
  - **Cheating in the agreements**

Introduced as follows:

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Differences in Cost

- **If all firms have identical costs,**
  - **Each firm produces the same quantity**
    - **Earn identical profit.**
- **Usually, the costs are different**
  - **Problems arise!**
- **The greater the differences in average costs**
  - **the greater the differences in economic profits**

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Differences in Cost

- **Try to equalize each firm's total profit,**
  - **High-cost firm should sell more than a low-cost firm**
- **This allocation scheme violates the profit-maximizing condition:**
  - **output for each firm resulting in identical marginal costs across firms**
- **If average costs differ across firms**
  - **Maximizes cartel profit yields unequal profit across cartel members**

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Number of Firms in the Cartel

- More firms in the industry,
  - More difficult it is to negotiate an acceptable allocation
- It becomes harder to achieve the agreements as the number of firms grows
  - One or more firms become dissatisfied and break the agreement
- If a cartel cannot block the entry
  - New comers will force prices down,
  - Squeezing economic profit
  - Cartel crash

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Cheating

- The biggest obstacle to keeping the cartel running:
  - Cheat on the agreement
- Offering a lower price (than agreement)
  - increase its sales and economic profit
- Oligopolists operate with excess capacity, they even cheat on the established price
- Will be discussed later (Game theory)

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Difficulties of Maintaining Cartel

- **Maintaining an effective cartel is difficult if**
  - **Product is differentiated among firms**
  - **Costs differ among firms**
  - **Many suppliers in the industry**
  - **Entry barriers are low, and**
  - **Cheating on the agreement becomes widespread**

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Price Leadership

- **An informal type of collusion:**
  - ***price leaders*** **set the price for the rest of the industry**
- **Dominant firm(s) establish the market price,**
  - **Other firms follow that lead to avoid price competition**

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摘自　事業獨占之規範 (鄭佑祥)

About Price Leader

- 由於主要生產者不多，每一生產者的產量在總產量中即占一顯著比例，因此，任何一生產者產量或價格的變化，均足以影響其他生產者的利益。故每一生產者皆十分關心其他生產者的行動，及其對自身之影響。同時亦關切自己的行動對其他生產者的影響，以及可能招致的應付或報復行動。由此可知寡占市場中個別廠商互相依賴性甚高。此種依賴性表現在價格方面，則呈現極爲穩定之現象，一旦價格建立後，很少變動，而且所差無多。這種價格的一致性與穩定性質係由「價格領袖」(price leader)之制度而產生。於寡占市場中生產者爲避免獨立定價之困擾，以及所訂定價與競爭業者不一致時可能引起的不良反應，往往不自行定價，而追隨該產業中某一特定生產者(即價格領袖)，視其所定之價格爲何，再依據其價格決定自己的價格，例如採取相同之價格，或就該價格領袖鎖定價格加減一適當百分比作爲自己之價格。寡占市場因價格穩定，無法採取降價的競爭措施，故常採非價格(non-price)的競爭方式，包括改善品質、增加服務項目或提供額外獎品。

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Obstacles in Price Leadership

- **Violates U.S. antitrust laws**
- **Product differentiation among sellers**
- **No guarantee that other firms will follow the leader**
  - **If they do not follow, the leader risks losing sales**
- **Some firms cheat on the agreement by cutting price**
- **Unless there are barriers to entry, a profitable price will attract entrants**

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Game Theory

- ***It examines oligopolistic behavior as a series of strategic moves and countermoves among rival firms***
- **Provides a general approach that allows us to focus on firms' incentives to cooperate or not**
- **A well-known example: Prisoner Dilemma.**

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The Story of Prisoner's Dilemma

- **Two suspects Ben and Jerry are caught**
- **The police need a confession**
- **Each suspect faces a choice:**
  - **Confessing**
  - **Denying**
- **Rule:**
  - **If only one confesses:**
    - **He goes free**
    - **The other gets a sentence of 10 years**
  - **If both deny the crime,**
    - **1-year sentence**
  - **If both confess**
    - **5 years**

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Analysis of Prisoner's Behavior

- **What will each prisoner do?**
- **Assume that each player tries to minimize his time in jail, regardless of what happens to the other**
- **A good approach is required to analyze their behaviors:**
  - **The payoff matrix**

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Payoff Matrix

- ***A table listing the rewards or penalties that each can expect based on the strategy of each player***
  - ***See next slide***
- **Each prisoner has two strategies: confessing or clamming up**
- **What strategies are rational to minimize jail time?**

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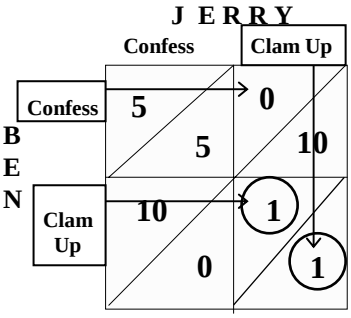
Payoff Matrix



From Ben view:
If Jerry clams up:
Confesses→0 ,
Clams up→1, confess is better.

If Jerry confess:
Confesses→5 ,
Clams up→10, confess is better.

Confess is dominating strategy!

Each has an incentive to confess and both get 5 years.
→dominant-strategy equilibrium of the game
Player's strategy does not depend on what the other does.

However, if both clam up, they would be better off!
If Ben and Jerry trust each other, they would adopt this strategy.

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Story of Price Setting Game

- **Prisoner's dilemma applies to many economic phenomena**
  - **Like: Pricing and advertising strategy**
- **Consider the market for gasoline with only two gas stations**
  - **a *duopoly***
- **Suppose customers consider only the price**

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Rule of Price Setting Game

- **Each station sets its price in the morning before knowing the other's price**
- **Only two prices are possible**
  - **Low price and high price**
- **What strategies are rational to maximize profits?**
- **The payoff matrix is in next figure.**

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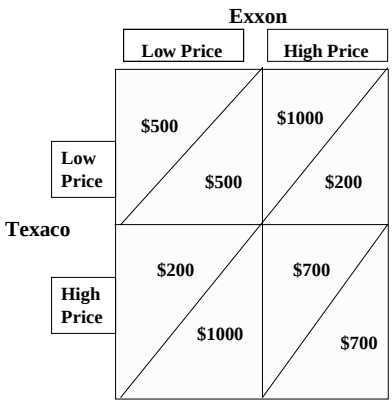
Price-Setting Payoff Matrix



From Texaco view:

If Exxon charges the low price,
Low price→500
High price→200 Low price is better.

If Exxon charges the high price,
Low price→1000
High price→700 Low price is better.

Low price is dominating strategy.
Exxon faces the same incentives

Each seller will charge the low price, regardless of what the other does → each earns $500 a day

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Betray the Cartel

- If each firm thinks other firms in the cartel will stick with their quotas,
  - they can increase profits by cutting price and increasing quantities
- If you think other firms will cheat and overproduce, then you will do, too.
- Either way your incentive as a cartel member is to cheat on the quota

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One-Shot vs. Repeated Games

- The outcome of a game often depends on whether it is a one-shot game or the repeated game
- The classic prisoner's dilemma is a one-shot game
  - → Game is played only once
- If the games can be repeated as would likely occur in the price setting game, other possibilities unfold

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Repeated Games

- **In a repeated-game, each player has a chance to establish a reputation for cooperation and encourages the other player to do so**
- **The cooperative solution makes both players better off than failing to cooperate**

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Tit-for-Tat Strategy (以牙還牙)

- **Experiments show that the strategy with the highest payoff in repeated games is the *tit-for-tat strategy***
- **You begin by cooperating in the first round**
- **On every round thereafter**
  - **If the other player cooperated in last round**
    - **Corporate!**
  - **If your opponent cheated**
    - **Cheat**

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Compare with Oligopoly and Perfect Competition

- **No typical model of oligopoly,**
  - **No direct comparison with perfect competition is available**
- **Imagine that many firms in a competitive industry and, through a series of mergers, combine them to four firms**
- **How would the behavior of firms differ before and after the merger**

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Oligopoly and Perfect Competition

- **Price is usually higher under oligopoly**
  - **With fewer competitors, remaining firms would become more interdependent**
  - **Coordinate pricing policies**
  - **Engage in some sort of collusion,**
    - **Output: lower**
    - **Price: higher**
- **Higher profits under oligopoly**
  - **If there are barriers to entry into the oligopoly, profits will be higher than under perfect competition in the long run**

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課堂報告

- Explain why monopolistic competitor has no supply curve
- Explain why monopolistic competitor can't stack up as an efficient allocator of resources
- Explain how the "economics of scale" can be the entry barrier
- Define what is cartel. Give a real example of cartel.
- Describe the prisoner's dilemma.
- Explain the tit-for-tat strategy.

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Homework

- 8. Features of market structure
- 11. Compare the monopolistic competition and perfect competition graphically
- 13. Analyze the problem with game theory

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