

FOUNDATION COURSE IN MANAGERIAL ECONOMICS

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Lecture 36: Oligopoly – Choice of P and Q using an example

Example

- Two firms: Vodafone and Airtel are service providers in a small town
- Assuming fixed cost = 0 and Marginal Cost = ₹10
- The market demand schedule is given
- They form a **Cartel**, i.e. firms colluding to decide on the price to charge and quantity to produce
- If they act like a monopoly in unison, for each firm: $Q = 30$, $P = ₹40$, profits = ₹900

Conflict between collusion and self interest

- Both firms earning higher profit (£900) if they stick to the cartel agreement
- But, individually they have incentive to break the agreement
- And together end up producing more than monopoly output at a lesser price and lesser profit (£800)
- Self interest and lack of trust on rivals may make it difficult for cartels to sustain
- Especially since there is no legal binding possible on the cartel members

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Lecture 37: Oligopoly – Equilibrium and other market outcomes

Oligopoly Equilibrium

The market outcome in case of oligopoly is called a **Nash Equilibrium** where economic participants interacting with one another each choose their best strategy given the strategies that all the others have chosen

Market Outcomes

- $Q_{\text{Competition}} > Q_{\text{Oligopoly}} > Q_{\text{monopoly}}$
- $P_{\text{Competition}} < P_{\text{Oligopoly}} < P_{\text{monopoly}}$
- Looking back at the two effects of increasing output:
 - **Output effect** – If $P > MC$, raising output raises profit
 - **Price effect** – Raising output reduces prices and hence profits
 - If Output effect $>$ Price effect, output will be increased and vice versa
- As the number of firms in a market increases price effect becomes smaller
- P approaches MC
- Oligopoly looks more like a competitive market
- Output increases towards competitive level

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Lecture 38: Oligopoly – Game Theory

Game Theory

- Game theory helps us understand oligopoly and other situations where “players” interact and behave strategically
- Players can be anyone – firms, individuals, countries etc
- Game is a situation where the players interact and respond to each other’s moves with an objective in mind
- Strategy is an action plan to win the game, taking into consideration the behaviour and likely responses from the opponent player(s)

Example of the Prisoners' Dilemma

- **Dominant strategy:** a strategy that is best for a player in a game regardless of the strategies chosen by the other players
- **Prisoners' dilemma:** a “game” between two captured criminals that illustrates why cooperation is difficult even when it is mutually beneficial

The Game

- The police have caught two suspected bank robbers A and B but only have enough evidence to imprison each for 1 year.
- The police question each in separate rooms and lay down the following offer:
 - If you confess and provide evidence against your partner, you go free.
 - If you do not confess but your partner implicates you, you get 20 years in prison.
 - If you both confess, each gets 8 years in prison.

Outcome

- Dominant strategy for each is to confess
- Nash Equilibrium : Both confess
- Both would have been better off if they remained silent
- Self interest leads each into choosing an outcome where both are actually worse off

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Lecture 39: Oligopoly – Game Theory (Contd.)

Vodafone and Airtel example relook as a Game

- Each firm's objective is to maximize profit
- They collude and decide to produce the monopolistic output together and charge the monopoly price
- So each produces 30 units and get a profit of ₹900
- If one breaks the agreement and produces 40, he gets ₹1000 and the other gets ₹750
- If both break the agreement, each gets ₹800
- What is each firm's dominant strategy
- What is the Nash Equilibrium?

Example 2: Coke and Pepsi's decision to advertise or not

- A duopoly market with only two major producers of aerated soft drinks
- Advertising can shift individual demand curve of each of the firms to the right
- But, advertising is costly
- Firms may collude and decide not to advertise, in which case each earns a profit of say, ₹80 crores each
- If both decide to advertise, they earn a profit of ₹30 crores each
- If one breaks the deal and advertises, and the other does not, it earns a profit of ₹130 crores while the other suffers a loss of ₹20 crores
- What is the dominant strategy for each firm?

Is cooperation possible?

- Repeated games can enforce a cooperative equilibrium
- What is the difference if it is a finite game?
- “Tit for tat” strategy – whatever one player does in one round, the other player does in the following round

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Lecture 40: Oligopolistic pricing

Implications of the Prisoner's dilemma on pricing

- **Kinked demand curve** – Demand is kinked at the currently prevailing price and is elastic above this price and inelastic below
- **Price rigidity** – Producers are reluctant to change prices even if costs or demand changes
- **Price signalling** – Implicit collusion where a firm initiates a price rise with the hope that the other will follow suit
- **Price leadership** – One of the firms acts as the price leader and announces price changes and the other firms follow

Price Leadership

- Dominant Price Leadership
- Barometric Price Leadership
- Aggressive Price Leadership

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Lecture 41: Public Policy towards Oligopolies

Government intervention

- In oligopolies, it is possible for output and price to be close to monopoly situation
- Hence government intervention required to
 - Promote competition
 - Prevent cooperation

Laws around the globe

- Sherman Antitrust Act (1890): Forbids collusion between competitors
- Clayton Antitrust Act (1914): Strengthened rights of individuals damaged by anticompetitive arrangements between firms
- In India, Competition Law (2002)
- NDRC in China

Why implementing the law could be difficult?

- While price fixing agreements are anti competitive, it is difficult to determine if there is a genuine reason to raise prices for everyone
- Business practices could be having economic rationale behind legitimate objectives and competition law could end up stifling them
- Three cases could be considered
 - Resale price maintenance
 - Predatory pricing
 - Tying