15 OLIGOPOLY
What Is Oligopoly?

Oligopoly is a market structure in which

- Natural or legal barriers prevent the entry of new firms.
- A small number of firms compete.
- Oligopoly sell (but more than two) of the homogeneous or differentiated products.
- So, oligopoly lies in between monopolistic competition and monopoly.
What Is Oligopoly?

Barriers to Entry

Either natural or legal barriers to entry can create oligopoly.

Figure 15.1 shows two oligopoly situations.

In part (a), there is a natural duopoly—a market with two firms.

(a) Natural duopoly
In part (b), there is a natural oligopoly market with three firms.

A legal oligopoly might arise even where the demand and costs leave room for a larger number of firms.
What Is Oligopoly?

Small Number of Firms
Because an oligopoly market has only a few firms, they are interdependent and face a temptation to cooperate.

Interdependence: With a small number of firms, each firm’s profit depends on every firm’s actions.

Temptation to Cooperate: Firms in oligopoly face the temptation to form a cartel.

A cartel is a group of firms acting together to limit output, raise price, and increase profit. Cartels are illegal. E.g. OPEC
Oligopoly Games

Game theory is a tool for studying strategic behavior:

- which is behavior that takes into account the expected behavior of others and the mutual recognition of interdependence.

All games have four common features:

- Rules
- Strategies
- Payoffs
- Outcome
The Prisoners’ Dilemma – Nash Equilibrium Model

In the prisoners’ dilemma game, two prisoners (Art and Bob) have been caught committing a petty crime.

**Rules**

The rules describe the setting of the game, the actions the players may take, and the consequences of those actions.

Each is held in a separate cell and cannot communicate with the other.
Each is told that both are suspected of committing a more serious crime.

If one of them confesses, he will get a 1-year sentence for cooperating while his accomplice will get a 10-year sentence for both crimes.

If both confess to the more serious crime, each receives 3 years in jail for both crimes.

If neither confesses, each receives a 2-year sentence for the minor crime only.
Oligopoly Games

Strategies

Strategies are all the possible actions of each player.

Art and Bob each have two possible actions:
1. Confess to the larger crime.
2. Deny having committed the larger crime.

With two players and two actions for each player, there are four possible outcomes:
1. Both confess.
2. Both deny.
3. Art confesses and Bob denies.
### Oligopoly Games

#### Payoffs

A **payoff matrix** is a table that shows the payoffs for every possible action by each player for every possible action by the other player.

![Payoff Matrix](image)

- **Art's strategies**
  - Confess: 3 years
  - Deny: 10 years

- **Bob's strategies**
  - Confess: 3 years, 1 year
  - Deny: 10 years, 2 years
Oligopoly Games

Outcome

If a player makes a rational choice in pursuit of his own best interest, he chooses the action that is best for him, given any action taken by the other player.

if A confess, the best action for B is to confess => 3 yrs
if A deny, the best action for B is to confess => 1 yrs

If both players are rational and choose their actions in this way, the outcome is an equilibrium called a Nash equilibrium—first proposed by John Nash.
Oligopoly Games

The Dilemma

The dilemma arises as each prisoner contemplates the consequences of his decision and puts himself in the place of his accomplice.

Each knows that it would be best if both denied. Trust?

But each also knows that if he denies it is in the best interest of the other to confess.

The dilemma leads to the equilibrium of the game.

In the Prisoner's Dilemma game – “CONFESS” is a Nash equilibrium because it is the best outcome, taking into account the likely actions of others.