# Principles of Microeconomics-II
# L2: Imperfect Competition

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# Two Extremes

Monopoly $\leftarrow - - - - - - - - - - - - - - - - - - \rightarrow$ Perfect Competition

- Lot of intermediate forms of market structures
- *Imperfect Competition*
  1. Monopolistic Competition (Chapter 16)
  2. Oligopoly (Chapter 17)

# Monopolistic Competition

- Competition: **(1)** Many sellers competing for the same customers & **(2)** Free entry and exit
- Monopolistic: **(3)**Each firm produces a commodity that is differentiated from other firms' products.
- What is "many"? What is "few"?

# Monopolistic Competition: Short Run

- Short Run: No entry or exit
- Downward sloping demand curve
- Optimality at MR = MC; equivalent to monopoly
- Profits or Losses possible

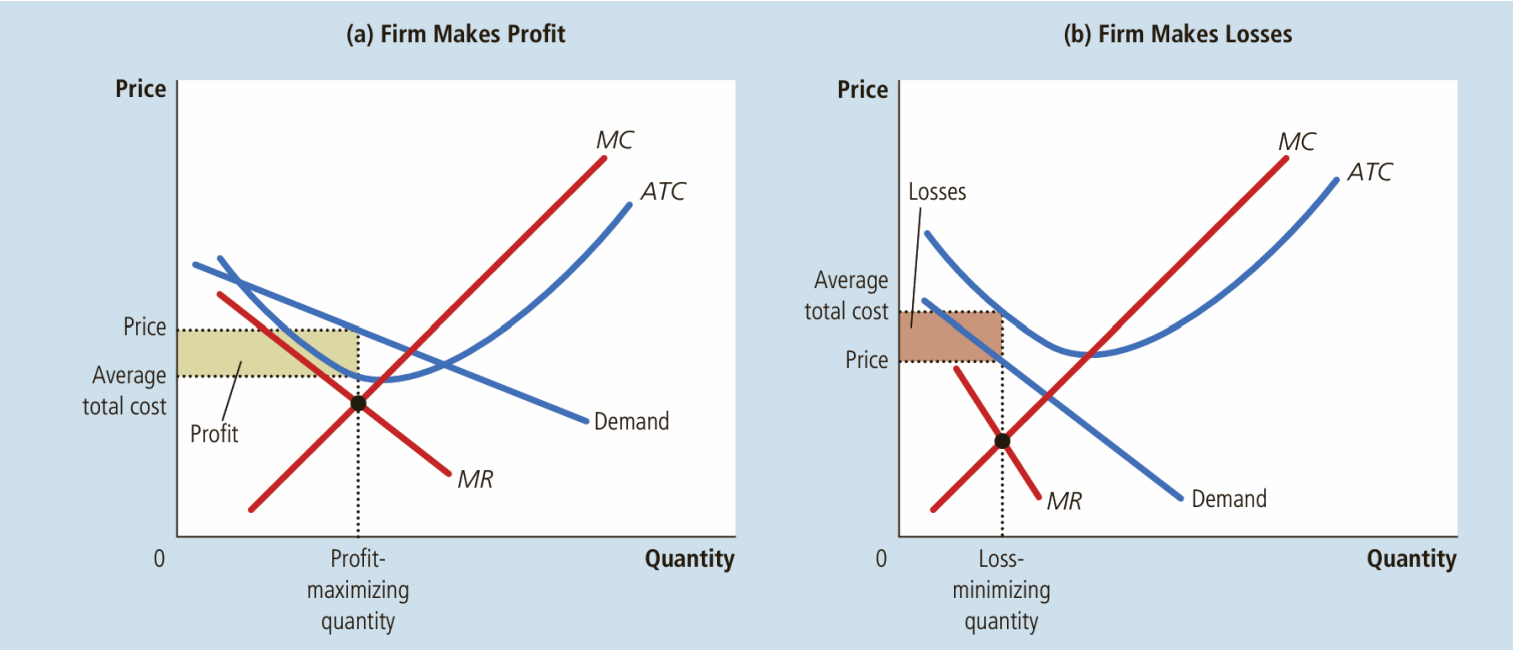


Figure: Short Run Behaviour of a Monopolistically Competitive Firm. *Source:* Chapter 16, Mankiw (2018)

# Monopolistic Competition: Long Run

1. Incumbent firms are making a profit $\rightarrow$ new firms will want to enter $\rightarrow$ more products for consumers to choose from $\rightarrow$ market demand is divided among more firms $\implies$ less demand/incumbent firm $\rightarrow$ declining profits of incumbent firms and $> 0$ profits of entrant firms.
2. Incumbent firms are making a loss $\rightarrow$ incentive to exit the market m$\rightarrow$ fewer products for consumers to choose from $\rightarrow$ demand curve of existing firms starts to shift to the right $\rightarrow$ more demand/existing firm $\rightarrow$ declining losses/higher profits
3. Adjustment till zero profit in the long run.

Conceptualised as sequential, no information about the sequence of particular players.

# Monopolistic Competition: Long Run

Zero maximum profit $\iff$ no distance between P(Q) and ATC $\iff$ tangency at P = ATC *and* MR = MC

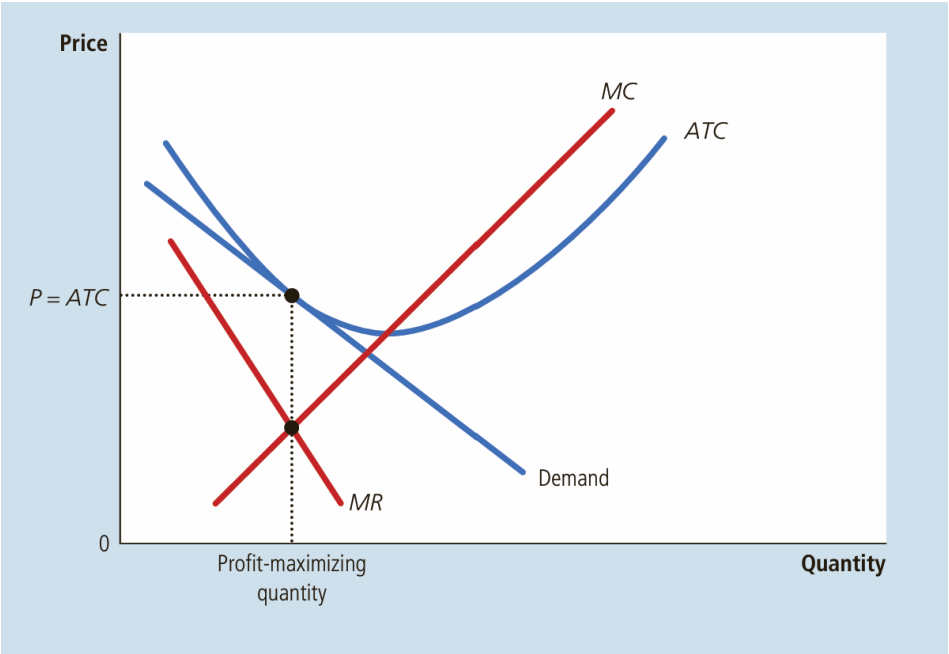


Figure: Long Run Behaviour of a Monopolistically Competitive Firm. *Source:* Chapter 16, Mankiw (2018)

# Monopolistic Competition: Temporality Matters

1. In the short run, behaves like a monopoly; P $>$ MC, can be $<$ or $>$ ATC.
2. In the long run, behaves like a competitive firm; P $>$ MC and P $=$ ATC.
3. In both cases, MR $=$ MC.
4. Free entry and exit drives economic profits to zero.

# Monopolistic Competition: Truly *Competitive*?

A monopolistically competitive firm is like a perfectly competitive firm in the long run in the sense that economic profits are zero because of free entry and exit.

- P - MC Markup; there is still market power
- Excess capacity; not at efficient scale

Where does this come from? Downward-sloping demand!

# Monopolistic Competition: Welfare & Other Considerations

- Efficiency: P-MC equalisation.
- Is there a deadweight loss? Yes!
- Regulation is costly: many firms! Difficult to enforce price controls in LR 0-profit conditions.
- How much variety is too much variety? Product-variety vs Business-stealing externalities.
- Advertising expenditure as a signal; non-disclosure as admittance of a bad product.

# Many & Few

1. One firm, one product: Monopoly
2. *Few* firms, same product: Oligopoly
3. *Many* firms, differentiated products that are close substitutes: Monopolistic Competition
4. $\infty$-ly many firms, one product: Perfect Competition

# Strategy Matters

- Competition
- Cooperation
- Collusion
- Cartels

# Oligopoly

Oligopolies characterise markets of imperfect competition where there are:

1. A few sellers –
2. – selling similar or identical products.
3. How to divide up the market?

Two sellers – a duopoly.

# Preliminaries: Game Theory

Modelling strategic behaviour: How must I behave **given** the actions of the other person? But the other person is also thinking just like me!

A strategic game consists of:

1. A set of players;
2. For each player, a set of actions;
3. For each player, preferences over the set of action profiles.

*Source:* Osborne (2003). An Introduction to Game Theory.

# Preliminaries: Notation

- There are $n$ players, denoted by $i$.
- For each player $i$, there is an action $a_i$.
- Preferences of each player over $a_i$ and $a_{-i}$ are denoted by the objective funtion (either $u_i$ or $\Pi_i$)

# Preliminaries: The Prisoner's Dilemma

Two suspects in a major crime are held in separate cells. There is enough evidence to convict each of them of a minor offense, but not enough evidence to convict either of them of the major crime unless one of them acts as an informer against the other (finks/confesses). If they both stay quiet, each will be convicted of the minor offense and spend one year in prison. If one and only one of them finks, she will be freed and used as a witness against the other, who will spend twenty years in prison. If they both confess, each will spend eight years in prison.

# Preliminaries: The Prisoner's Dilemma

1. Players: $\{1, 2\}$
2. Actions for each player: $A_i = \{\text{Confess, Remain Silent}\}$
3. Preferences: $u_i(C, S) > u_i(S, S) > u_i(C, C) > u_i(S, C)$

Preferences are over my actions as well as the other person's actions!

# Preliminaries: The Prisoner's Dilemma

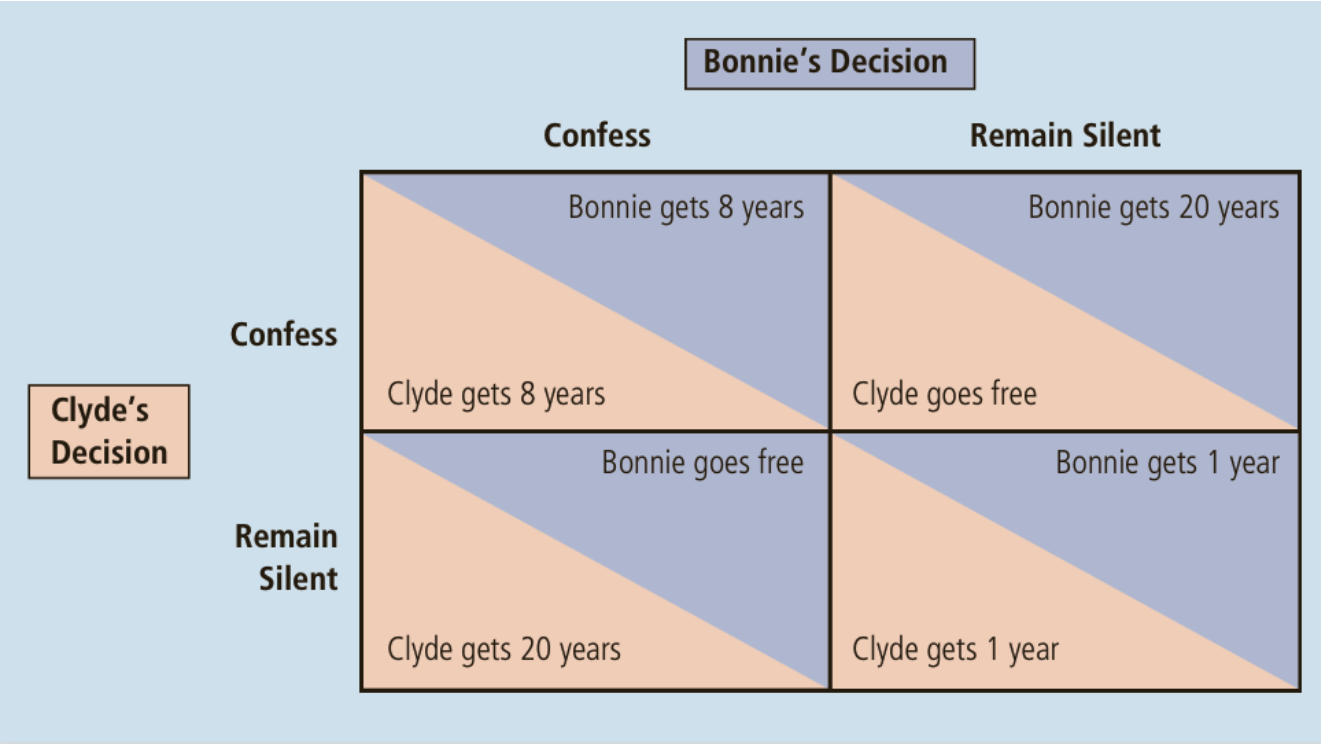


Figure: The Prisoner's Dilemma. *Source:* Chapter 17, Mankiw (2018)

# Preliminaries: Best Responses

For each given action of player $j$, what is the action of player $i$ that gives player $i$ the maximum benefit? Say Clyde is player $i$.

1. $B_i(Confess) = Confess$
2. $B_i(Silent) = Confess$
3. For each of Bonnie's actions, what is the best action that Clyde can take? Confess!
4. Similarly, for each of Clyde's actions, what is the best action that Bonnie can take? Confess!

# Preliminaries: Nash Equilibrium

A Nash Equilibrium is a situation where each player $i$ chooses an action $a_i^*$ such that it gives player $i$ the maximum possible benefit *given* the actions $a^*_{-i}$ of all other players.

- $\iff$ There is no incentive for unilateral deviation keeping the actions of everyone else unchanged.
- $\iff$ Each player is playing their best response to the actions of every other player.

# Preliminaries: Nash Equilibrium

What is the Nash Equilibrium of the Prisoner's Dilemma? (Confess, Confess).

Is it efficient? There are gains from cooperation!

The Prisoner's Dilemma is a game of conflict!

# Preliminaries: Application of the PD

Working on a joint group project. What is the Nash Equilibrium?

| | *Work hard* | *Goof off* |
|---|---|---|
| *Work hard* | 2, 2 | 0, 3 |
| *Goof off* | 3, 0 | 1, 1 |

**Figure 14.1** Working on a joint project.

Figure: *Source:* Chapter 2. Osborne (2003).

# Preliminaries: Strictly Dominant Strategy

A player's action $a_i$ is a dominant strategy if it is a best response for *every* other action of the other players ($a_{-i}$). The player will play a strictly dominant strategy irrespective of what the other players are choosing.

If ALL players have a strictly dominant strategy, we will have a dominant strategy equilibrium. That is by definition also a Nash Equilibrium.

# Preliminaries: Competition vs Cooperation

The Nash Equilibrium is not unique. Bach vs Stravinsky.

| | *Bach* | *Stravinsky* |
|---|---|---|
| *Bach* | 2, 1 | 0, 0 |
| *Stravinsky* | 0, 0 | 1, 2 |

**Figure 16.1** *Bach or Stravinsky?* (*BoS*) (Example 16.2).

Figure: *Source:* Chapter 2. Osborne (2003).

# Oligopoly as a Strategic Game

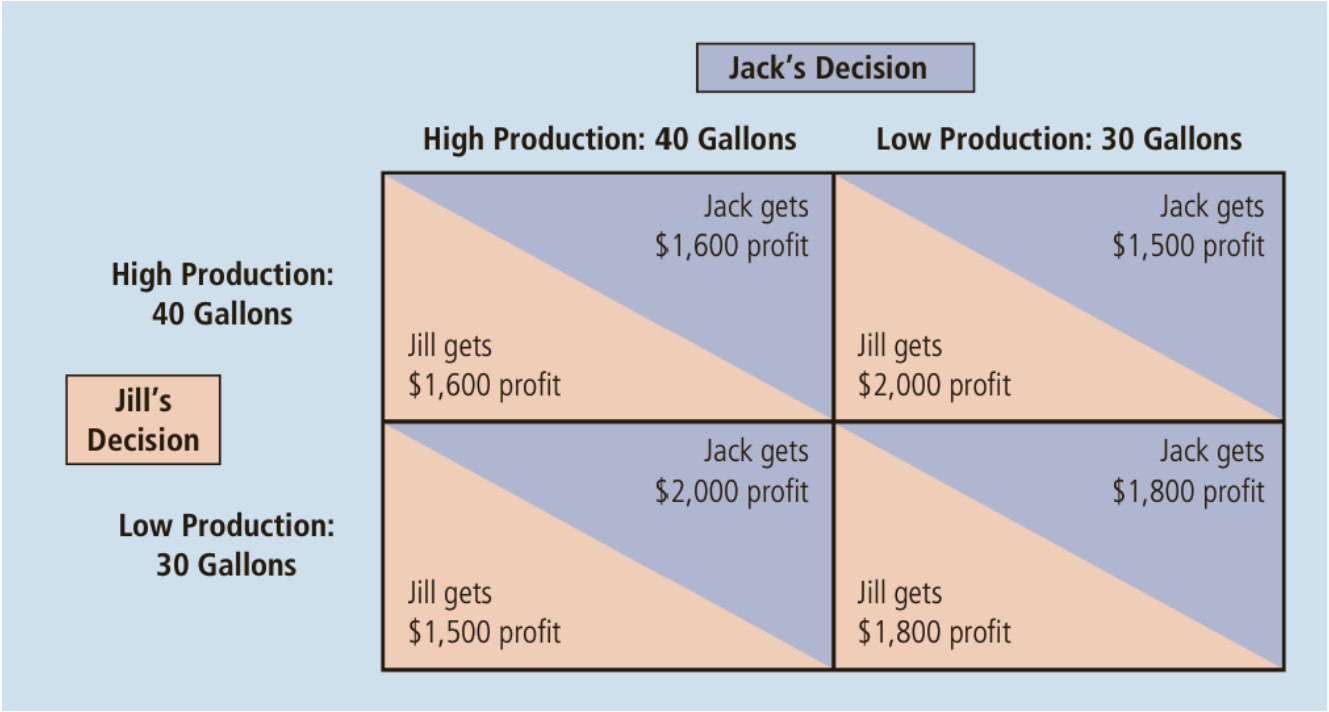


Figure: Duopoly. *Source:* Chapter 17. Mankiw (2018)

1. There are gains for cooperation to be realised – cartels!
2. "The monopoly outcome is jointly rational but each oligopolist has an incentive to cheat." (p. 345)

# How to build cooperation?

- Until now, we have operated in the world of simultaneous games.
- Repeated simultaneous games can build cooperation!
- We do not deal with sequential games in this course.

# Oligopoly Regulation

Anti-trust regulation!

- Price-fixing is detrimental to competition and consumers!
- Can undercutting prices signal monopoly power? Predatory pricing.
- Bundling/Tying