

Oligopoly

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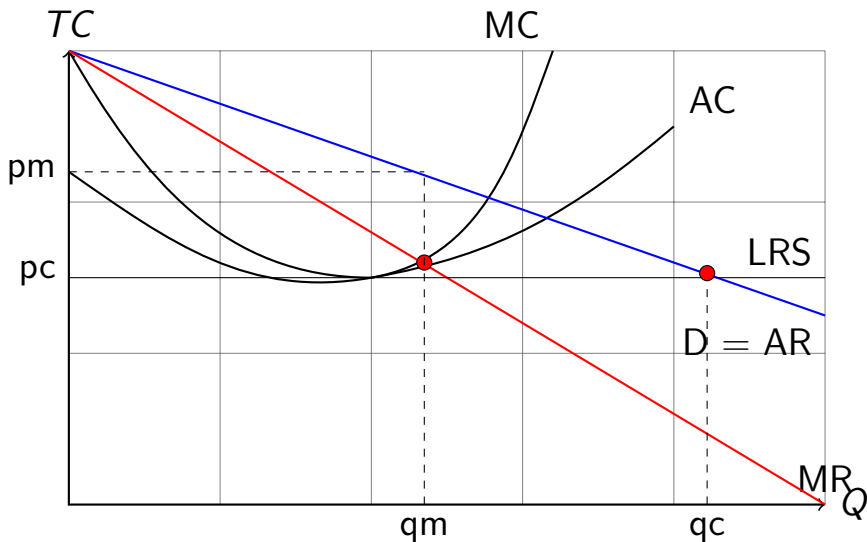
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Imperfect competition

There are two broad categories of *imperfect competition*

- Monopolistic competition: where there is *product differentiation*. There tend to be lots of small companies because there are no barriers to entry
- Oligopoly: where there are some barriers to entry. There tend to be a few large companies

Competition vs monopoly



Factors that influence level of competition

The level of competition is influenced by

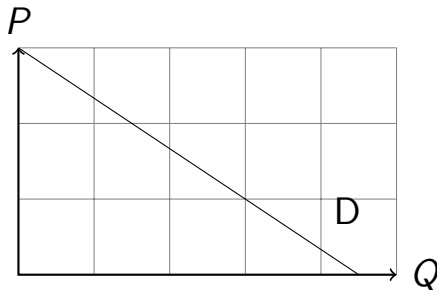
- The number of firms
- The variability of
 - demand
 - costs
 - technology
- Level of product standardisation
- Durability of barriers to entry
- Level of social cohesion

Interdependence

- A key feature of oligopoly is *interdependence*.
- The firm is influenced by the other firms in the industry
- Actions (pricing and output) will depend on expected action of other firms
- More complicated analysis.
- Use of *game theory*

Duopoly

Q	P	TR ($P \times Q$)
0	120	0
20	100	2000
40	80	3200
60	60	3600
80	40	3200
100	20	2000
120	0	0



Duopoly 2

Outcome depends on the action of the two firms.
Marginal cost of drawing water is zero

- Competition

- $MC = MR = 0$ (output equal to 60 litres)
- Total output is equal to 120 litres

- Collusion

- Profit is maximised at 60 litres (30 each)
- profit is 3600 (1800 each)

Cartels

- OPEC
- LCD display
- England football shirts
- FX fixing

Nash equilibrium

Without a cartel, there is an incentive to push output above the *joint* profit-maximising

- Each produce 30 litres at 60 (profit is 3600 or 1800 each)
- There is an incentive for one to cheat and produce 40 litres
- Total output of 70, price 50, profit 3500 (2000-1500 split)
- Or, total output 80, price 40, profit 3200 (1600 each)
- *Nash equilibrium*
- Total output 90, price 30, profit 2700 (1500 1200 split)

Number of firms

The larger the number of firms, the more likely that the firm will increase output. Decision for each firm is a balance of

- Output effect (if price is above marginal cost, selling more will raise profit)
- Price effect (raising output will increase total output and reduce the price and the profit on all the units sold)

At the extreme as number of firms tends to infinity, output effect dominates and there is perfect competition.

Game theory

Game theory is the study of decision-making under interdependence.

- Players or actors make *strategic decisions*
- Strategies have *pay-offs* that depend on the decision and the decision that is adopted by other players
- Own pay-offs and pay-offs to other players are known
- These are portrayed in a *pay-off matrix*

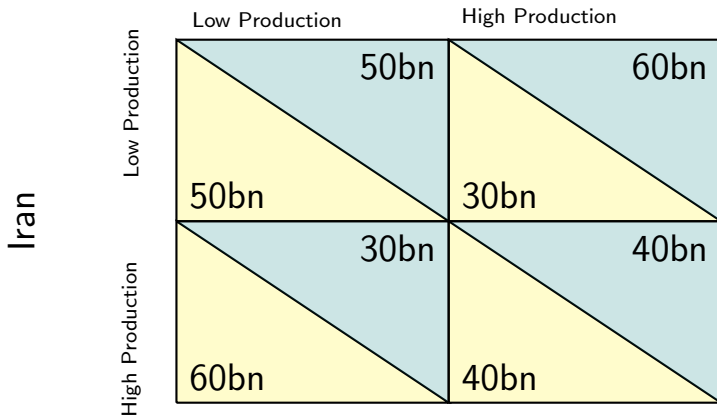
Prisoners' dilemma 1

Prisoner B

		Prisoner B	
		Keep Quiet	Confess
Prisoner A	Keep Quiet	1 / 1	0 / 20
	Confess	20 / 0	8 / 8

Prisoners' dilemma 2

Saudi Arabia



Prisoners' dilemma 3

		Firm B	
		No Advertising	Advertising
Firm A	No Advertising	<div>4bn</div> <div>4bn</div>	<div>5bn</div> <div>2bn</div>
	Advertising	<div>2bn</div> <div>5bn</div>	<div>3bn</div> <div>3bn</div>

Cooperative games

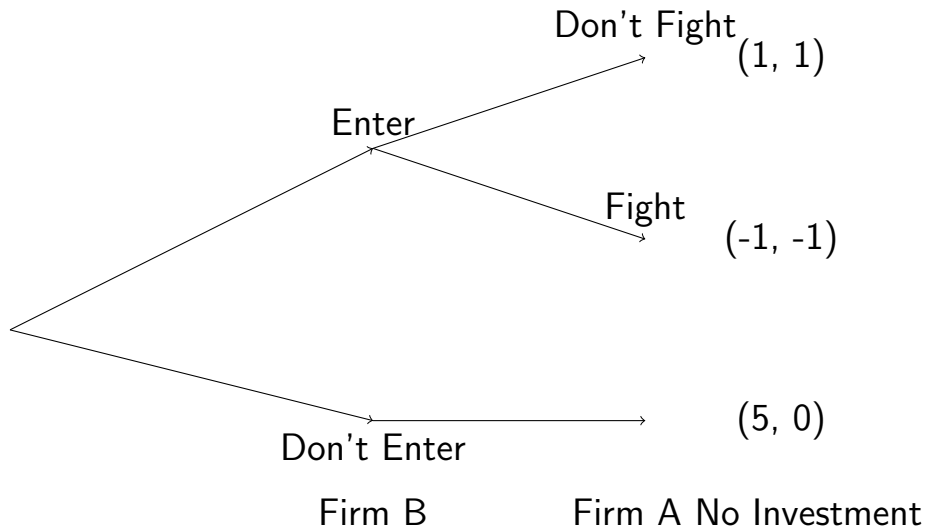
It is often the case that a better outcome can be reached with cooperation. However, this demand some agreement between the parties.

- Commitment: taking some action that determines future decisions (*Conquistadores*)
- Threats and punishment (Over-production, beating ...)
- Repeated games and *Super-games*
- The auction of G3 networks

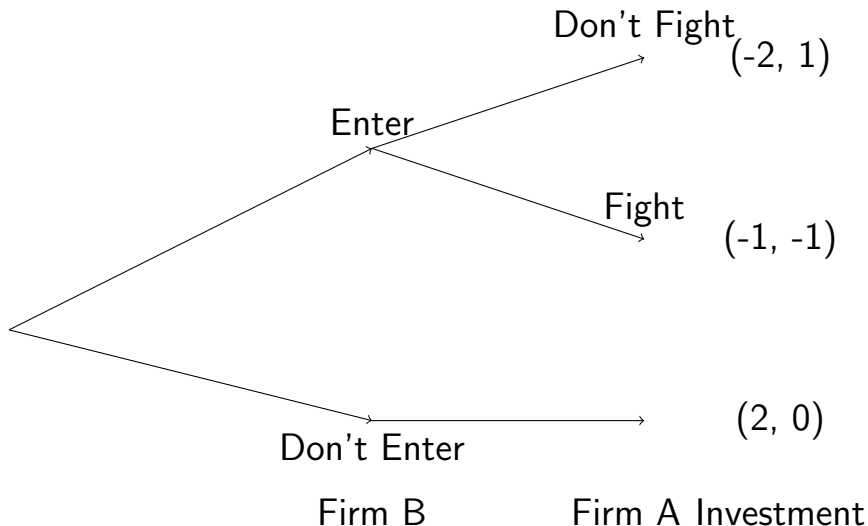
Other issues

- Product differentiation
 - The more differentiated, the more market power
- Barriers to entry
 - *Contestable markets*
 - Credible threats

Credible Threats: No investment



Credible Threats: Investment



Controversies

- Retail price maintenance
 - De Beers/Jean
- Predatory pricing
 - Lemon bus
- Tying
 - Gillette-printers