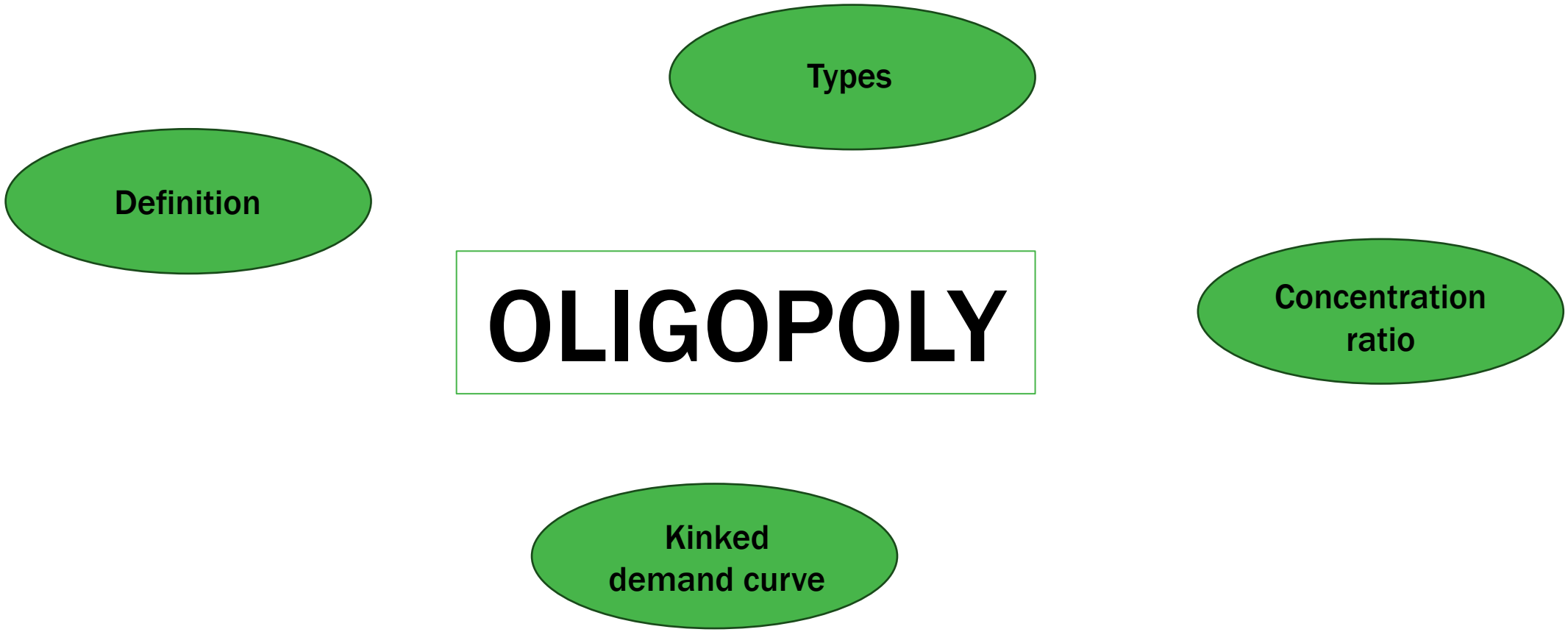
2. PRICE MECHANISM IN OLIGOPOLY

WHAT IS AN OLIGOPOLY?

FLASHBACK



OLIGOPOLY PRICING

Principles of oligopolistic price-setting

- Few competition >>> oligopolist is price-setter or price-maker
- Like any supplier, oligopolist aim to maximize profit

  MR = MC
- Since the competition is very “close”, oligopolists tend to compete on non-price elements >>> non-price competition (other elements of the marketing mix)

  GAME THEORY APPLIES TO OLIGOPOLIES

GAME THEORY

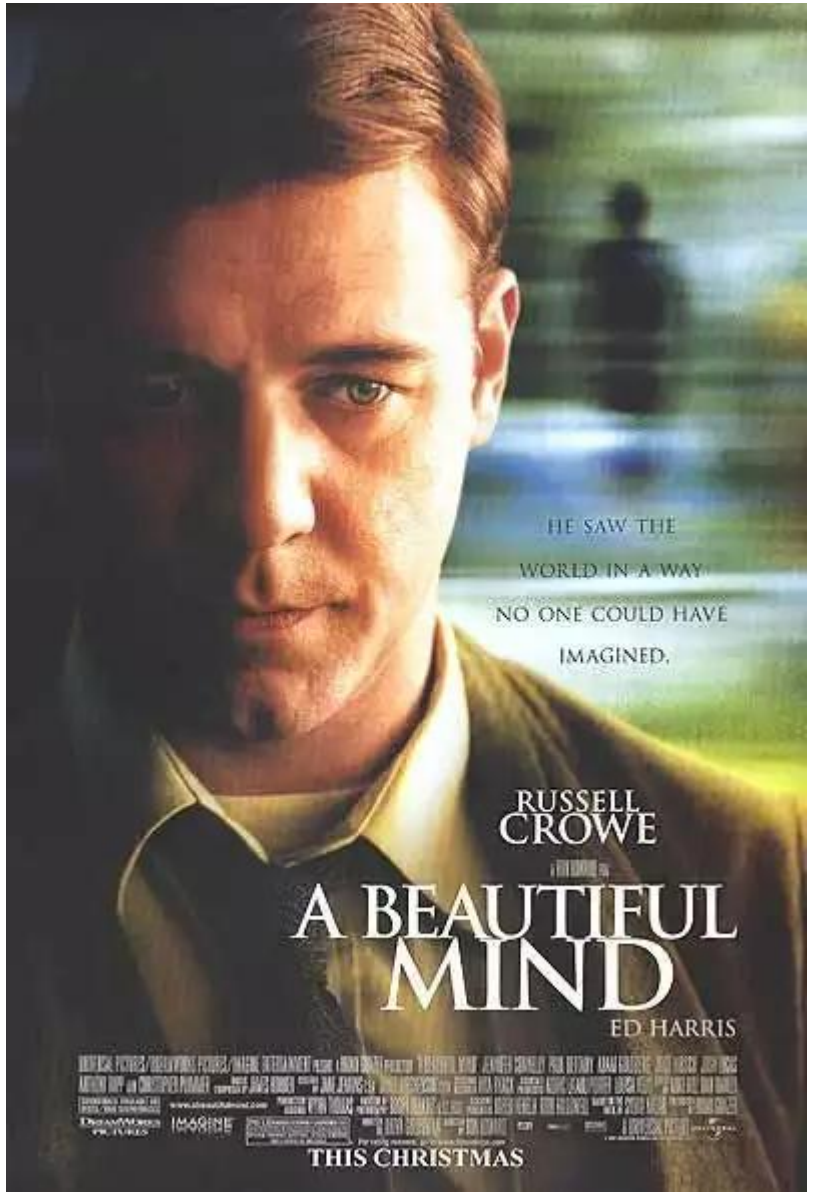
WHAT IS GAME THEORY?

“SETTING THE SCENE”

Let’s watch a scene from the movie “A Beautiful Mind”.

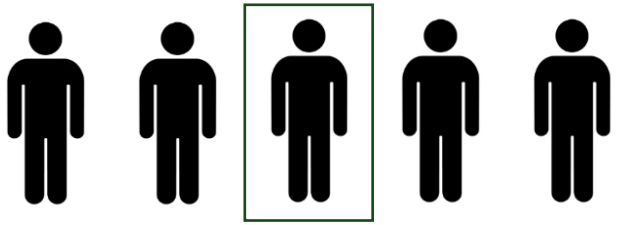
The movie tells the life of John Nash, a famous American mathematician who developed the game theory that can be applied in economics to the behaviour of oligopolists.

Nash received the Nobel Prize for his game theory.



Situation:

John Nash is a student at the (Princeton) university and having a good time with his 4 friends in a bar.



Suddenly, a group of girls enters the bar: a blonde girl and her friends, 4 brunettes.

The blonde girl draws all the attention to herself.

Challenge: All the guys want to hit on the blonde girl
(assumption: Nash does not play)

Solution:

According to theory of Adam Smith: theory of competitive markets:

The guys are competitors of each other and all go for the blonde girl.
"Individual ambition serves the common good"
(NL: "Eigenbelang dient het algemeen belang".)

It is every man for himself. Every man is doing what is best for himself.

The self-interest of consumers and suppliers will always lead the economy to an equilibrium

Solution:

According to theory of John Nash: game theory:

ADAM SMITH: The guys are competitors of each other but if they all go for the blonde girl, they will block each other.

If the guys then go for her friends, they will not succeed, because the brunettes do not like to be second choice.

Result: everyone “loses”.

NASH THEORY: the guys go for the brunettes. They will not block each other. Every man is doing what is best for himself AND THE GROUP.

Result: there is both “individual” win and “global” win.

GAME THEORY

Game theory analyzes competitive players' decisions under the assumption that players take into account their own results and the results of other players in a rational way.

The system can be applied to any situation where competition is tight and and where players must constantly take into account their direct competitors to achieve the most optimal result.

Examples:

- politics: peace negotiations between countries in conflict
- macroeconomics: trade negotiations
- microeconomics: non-price competition in oligopolies

APPLICATION: OLIGOPOLY

We know that oligopolists focus on non-price competition strategies.

Imagine an oligopoly of 2 suppliers X and Y = duopoly.

2 strategies: “no new product launch” or “new product launch”.

Below: result matrix
(profit in k€)

		Y	
		NO NEW PRODUCT LAUNCH	NEW PRODUCT LAUNCH
X	NO NEW PRODUCT LAUNCH	(300 , 300)	(200 , 500)
	NEW PRODUCT LAUNCH	(500 , 200)	(400 , 400)

Step 1: each competitor looks for the optimal strategy taking into account his interests (maximize profit) and the strategy of the competitor.

		Y	
		NO NEW PRODUCT LAUNCH	NEW PRODUCT LAUNCH
X	NO NEW PRODUCT LAUNCH	(300 , 300)	(200 , 500)
	NEW PRODUCT LAUNCH	(500 , 200)	(400 , 400)

We call this: **BEST-RESPONSE STRATEGY**

X: if Y would not launch new product, best response for X = to launch new product (500k > 300k)

if Y would launch new product, best response for X = to launch new product (400k > 200k)

Y: if X would not launch new product, best response for Y = to launch new product (500k > 300k)

if X would launch new product, best response for Y = to launch new product (400k > 200k)

Step 2: each competitor identifies his dominant strategy.

		Y	
		NO NEW PRODUCT LAUNCH	NEW PRODUCT LAUNCH
X	NO NEW PRODUCT LAUNCH	(300 , 300)	(200 , 500)
	NEW PRODUCT LAUNCH	(500 , 200)	(400 , 400)

DOMINANT STRATEGY occurs if both best-response strategies are identical

X: dominant strategy = to launch new product

Y: dominant strategy = to launch new product

Step 3: **NASH EQUILIBRIUM** occurs when dominant strategies of each competitor coincide

NE: (400 , 400)

Step 4: This also results in the best overall outcome for the market, so it is **PARETO-OPTIMAL** (300k + 300k = 600k, 200k + 500k = 700k, 500k + 200k = 700k, 400k + 400k = 800k)

EXAMPLE 2

Imagine an oligopoly of 2 shops in a city at the coast. Summer season is arriving.

Shop 1 = BEACH MARKET (BM)

Shop 2 = SEA STAR (SS)

2 strategies: “no promotion” or “heavy promotion”.

Below: result matrix
(profit in k€)

		SEA STAR	
		NO PROMOTION	HEAVY PROMOTION
BEACH MARKET	NO PROMOTION	(600 , 600)	(400 , 700)
	HEAVY PROMOTION	(700 , 400)	(500 , 500)

Step 1: each competitor looks for the optimal strategy taking into account his interests (maximize profit) and the strategy of the competitor.

		SEA STAR	
		NO PROMOTION	HEAVY PROMOTION
BEACH MARKET	NO PROMOTION	(600 , 600)	(400 , 700)
	HEAVY PROMOTION	(700 , 400)	(500 , 500)

We call this: **BEST-RESPONSE STRATEGY**

BM: if SS would not do any promotion, best response for BM = to do heavy promotion (700k > 600k)

if SS would do heavy promotion, best response for BM = to do heavy promotion (500k > 400k)

SS: if BM would not do any promotion, best response for SS = to do heavy promotion (700k > 600k)

if BM would do heavy promotion, best response for SS = to do heavy promotion (500k > 400k)

Step 2: each competitor identifies his dominant strategy.

		SEA STAR	
		NO PROMOTION	HEAVY PROMOTION
BEACH MARKET	NO PROMOTION	(600 , 600)	(400 , 700)
	HEAVY PROMOTION	(700 , 400)	(500 , 500)

DOMINANT STRATEGY occurs if both best-response strategies are identical

BM: dominant strategy = to do heavy promotion

SS: dominant strategy = to do heavy promotion

Step 3: **NASH EQUILIBRIUM** occurs when dominant strategies of each competitor coincide

NE: (500 , 500)

Step 4: But this does not result in the best overall outcome for the market, so it is **NOT PARETO-OPTIMAL** (600k + 600k = 1.200k, 400k + 700k = 1.100k, 700k + 400k = 1.100k, 500k + 500k = 1.000k)

1.200k > 1.000k

In this case, it would be better for the shops to set-up an agreement NOT TO DO PROMOTIONS.

But that is called a CARTEL, and since it blocks competition, it is illegal.

Extra:

Game theory applied on oligopolies assumes that there is no cooperation between the market players (non-cooperative game).

But in reality, collusion may occur.

The European Commission has found that Daimler, BMW and Volkswagen group (Volkswagen, Audi and Porsche) breached EU antitrust rules by colluding on customer service policies. The Commission has imposed a fine of € 875 189 000. Daimler was not fined, as it revealed the existence of the cartel to the Commission. All parties acknowledged their involvement in the cartel.

EXERCISE

Two companies in the chocolate industry are dominating the market. Company CHOCOKING (row player) and company SWEETCHOC (column player) face two strategies: advertise (strategy 1) or not advertise (strategy 2).

If CHOCOKING and SWEETCHOC both choose to advertise, the profit for CHOCOKING will be €40 million, the profit for SWEETCHOC will be €30 million.

If CHOCOKING chooses to advertise and SWEETCHOC chooses not to advertise, the profit for CHOCOKING will be €50 million and the profit for SWEETCHOC will be €10 million.

If CHOCOKING chooses not to advertise and SWEETCHOC chooses to advertise, the profit for CHOCOKING will be €20 million and the profit for SWEETCHOC will be €40 million.

If both companies choose not to advertise, profits will be €30 million for CHOCOKING and €20 million for SWEETCHOC.

1. Fill-in the result matrix below
2. Define the best-response strategies for each supplier
3. Define the dominant strategy for each supplier (if there is one)
4. Define the Nash equilibrium (if there is one)
5. Analyze the NE: is it Pareto-optimal or not?

Justify each step using the figures from the result matrix!

STEP 1:

		SWEETCHOC	
CHOCOKING			

STEP 2:

STEP 3:

STEP 4:

STEP 5: