Unit 4: Imperfect Competition

Oligopoly

FOUR MARKET MODELS

Characteristics of Oligopolies:

- A Few Large Producers (Less than 10)
- Identical or Differentiated Products
- High Barriers to Entry
- Control Over Price (Price Maker)
- Mutual Interdependence
  - Firms use Strategic Pricing

Examples: OPEC, Cereal Companies, Car Producers

HOW DO OLIGOPOLIES OCCUR?

Oligopolies occur when only a few large firms start to control an industry.

High barriers to entry keep others from entering.

Types of Barriers to Entry

1. Economies of Scale

- **Ex: The car industry is difficult to enter because only large firms can make cars at the lowest cost**

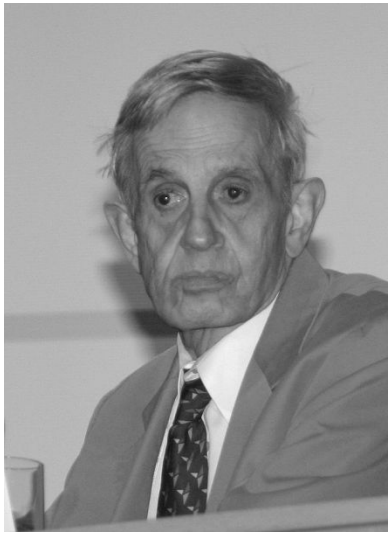
2. High Start-up Costs

3. Ownership of Raw Materials

Game Theory

The study of how people behave in strategic situations

An understanding of game theory helps firms in an oligopoly maximize profit.



John Nash and Game Theory

Game theory helps predict human behavior

THE ICE CREAM MAN SIMULATION

1. You are a ice cream salesmen at the beach
2. You have identical prices as another salesmen.
3. Beachgoers will purchase from the closest salesmen
4. People are evenly distributed along the beach.
5. Each morning the two firms pick locations on the beach

Where is the best location?

Where should you put your firm?

B A

Firm A decides where to goes first.

- **What is the best strategy for choosing a location each day?**
- **Can you predict the end result each day?**
- **How is this observed in the "real-world"?**

Where should you put your firm?

A B

Firm A decides where to goes first.

- **What is the best strategy for choosing a location each day?**
- **Can you predict the end result each day?**
- **How is this observed in the "real-world"?**

Why learn about game theory?

- Oligopolies are interdependent since they compete with only a few other firms.
- Their pricing and output decisions must be strategic as to avoid economic losses.
- Game theory helps us analyze their strategies.

SIMULATION!

1. In four groups take out two half sheets of paper
2. On one half write X and the other write Y
3. Groups cannot talk to other groups
4. Your goal is to earn the as much candy as possible *AS WELL AS* have the class earn as much candy as possible as a group.

Behavior	Pay-Off
4-Xs Played	**Each X Loses 1 candy**
3-Xs and 1-Y Played	**Each X Wins 1 candy** **Each Y Loses 1 candy**
2-Xs and 2-Ys Played	**Each X Wins 2 candies** **Each Y Loses 2 candies**
1X and 3-Ys Played	**X Wins 3 candies** **Each Y Loses 1 candy**
4-Ys Played	**Each Y wins 1 candy**

The Prisoner's Dilemma

Charged with a crime, each prisoner has one of two choices: Deny or Confess

		Prisoner 2	
		Deny	**Confess**
Prisoner 1	**Deny**	Both Deny = 5 Years in jail each	Confess = Free Deny =20 Years
	Confess	Confess = Free Deny = 20 Years	Both Confess= 10 Years in jail each

Game Theory Matrix

Game Theory Matrix

You and your partner are competing firms. You have one of two choices: Price High or Price Low.

Without talking, write down your choice

		Firm 2	
		High	**Low**
Firm 1	**High**	**Both High = $20 Each**	**Low = $30 High = 0**
	Low	**High = 0 Low = $30**	**Both Low= $10 each**

Game Theory Matrix

Notice that you have an incentive to collude but also an incentive to cheat on your agreement

Firm 1 \ Firm 2	High	Low
High	Both High = $20 Each	Low = $30 High = 0
Low	High = 0 Low = $30	Both Low= $10 each

Dominant Strategy

The dominant strategy is the best move to make regardless of what your opponent does

What is each firm's dominate strategy?

Firm #1-Dominant strategy is high since they should always go high

Firm #2- Doesn't have a dominate strategy

Dominant Strategy

<u>Nash Equilibrium-</u> The outcome that will occur when both firms make decisions simultaneously and have all the information

The Nash Equilibrium- Firm 1 High, Firm 2 Low

Since Firm 1 will always go high, Firm 2 will decided to go low

Video: Split or Steal

Econmovies
Episode 8: The Dark Knight

What did we learn?

1. **Oligopolies must use strategic pricing (they have to worry about the other guy)**
2. **Oligopolies have a tendency to collude to gain profit.**
   (Collusion is the act of cooperating with rivals in order to "rig" a situation)
3. **Collusion results in the incentive to cheat.**
4. **Firms make informed decisions based on their dominant strategies**

2008 Audit Exam

		Gmine: Cheat	Gmine: Not Cheat
Bmine	Cheat	$10, $5	$25, $20
	Not Cheat	$5, $15	$20, $25

Which of the following correctly describes the dominant strategy of each firm?

(A) Neither Gmine nor Bmine has a dominant strategy.
(B) Gmine's dominant strategy is to not cheat; Bmine does not have a dominant strategy.
(C) Gmine's dominant strategy is to cheat; Bmine does not have a dominant strategy.
(D) Gmine's dominant strategy is to cheat; Bmine's dominant strategy is to not cheat.
(E) Gmine's dominant strategy is to not cheat; Bmine's dominant strategy is to cheat.

2009 FRQB #3

Payoff matrix for two competing bus companies

		City Wheels: Maintain Fare	City Wheels: Lower Fare
Easy Ride	Maintain Fare	\$150, \$180	\$130, \$120
	Lower Fare	\$120, \$130	\$140, \$110

(a) If Easy Ride chooses to maintain its current fare, which strategy is better for City Wheels? Explain.

(b) Is there a dominant strategy for Easy Ride? Explain.

(c) Assume that the companies must make their decisions simultaneously and do not cooperate. What will be the daily profit for each firm?

(d) If these two firms could cooperate, which strategy would each firm choose?

(e) Suppose that the local government decides to provide a subsidy of \$40 per day to the bus companies. However, only a company that agrees to lower its fare is eligible to receive the subsidy. Draw a new payoff matrix to reflect the change in government policy.

2009 FRQB #3

6 points (1 + 2 + 1 + 1 + 1)

(a) 1 point:
- One point is earned for concluding that City Wheels maintains its current fare, since \$180 > \$120.

(b) 2 points:
- One point is earned for stating that Easy Ride does NOT have a dominant strategy.
- One point is earned for explaining that Easy Ride's best move depends on City Wheels' move.

(c) 1 point:
- One point is earned for stating that the profit to Easy Ride is \$150 and the profit to City Wheels is \$180.

(d) 1 point:
- One point is earned for stating that the cooperative solution is for both to maintain their current fares.

(e) 1 point:
- One point is earned for showing the correct entries in the new payoff matrix as follows:

		City Wheels: Maintain Fare	City Wheels: Lower Fare
Easy Ride	Maintain Fare	\$150, \$180	\$130, \$160
	Lower Fare	\$160, \$130	\$180, \$150

Oligopoly Graphs

Because firms are interdependent

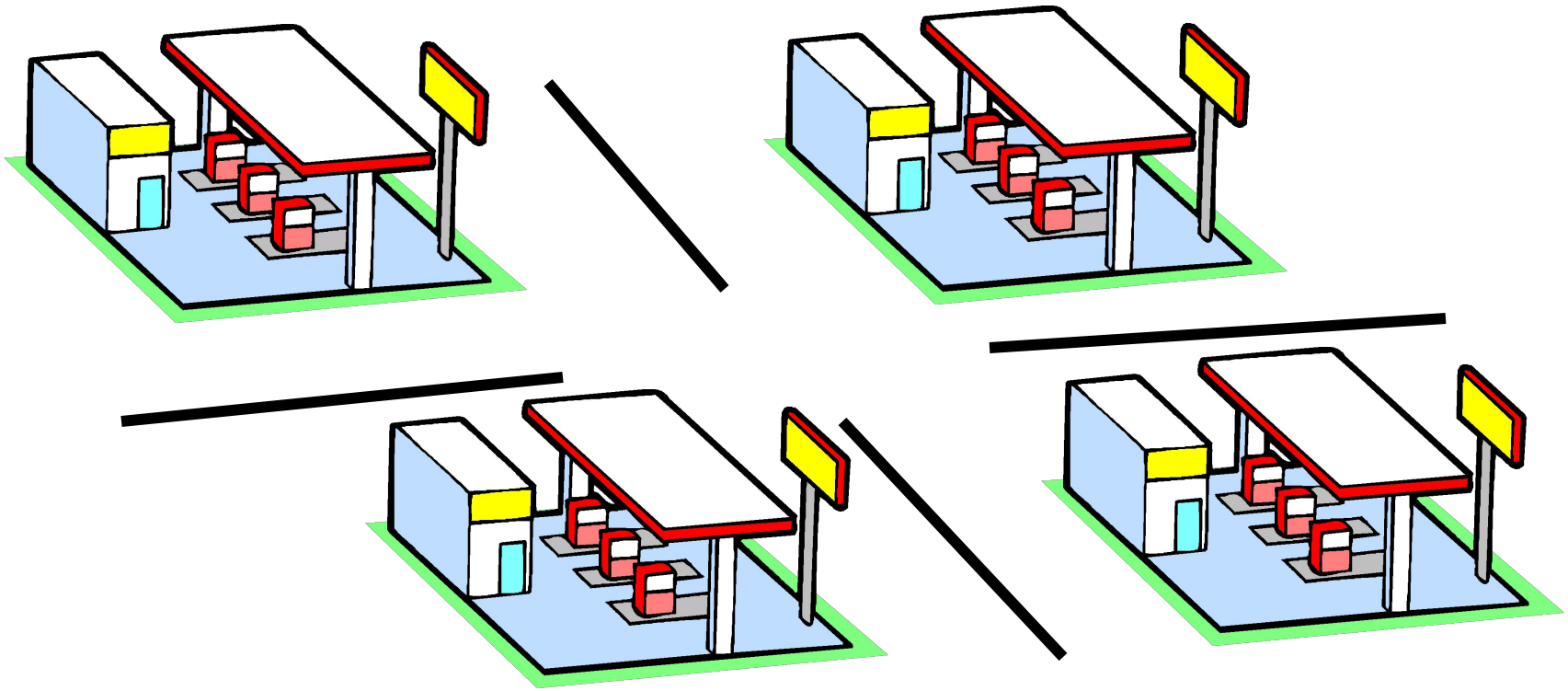
There are 3 types of Oligopolies

1. **Price Leadership (no graph)**
2. **Colluding Oligopoly**
3. **Non Colluding Oligopoly**

#1. Price Leadership

Example: Small Town Gas Stations

To maximize profit what will they do?



OPEC does this with OIL

Price Leadership

- **Collusion is ILLEGAL.**
- **Firms CANNOT set prices.**
- **Price leadership is a strategy used by firms to coordinate prices without outright collusion**

General Process:

1. **"Dominant firm" initiates a price change**
2. **Other firms follow the leader**

Price Leadership

Breakdowns in Price Leadership

- **Temporary Price Wars may occur if other firms don't follow price increases of dominant firm.**
- **Each firm tries to undercut each other.**

Example: Employee Pricing for Ford

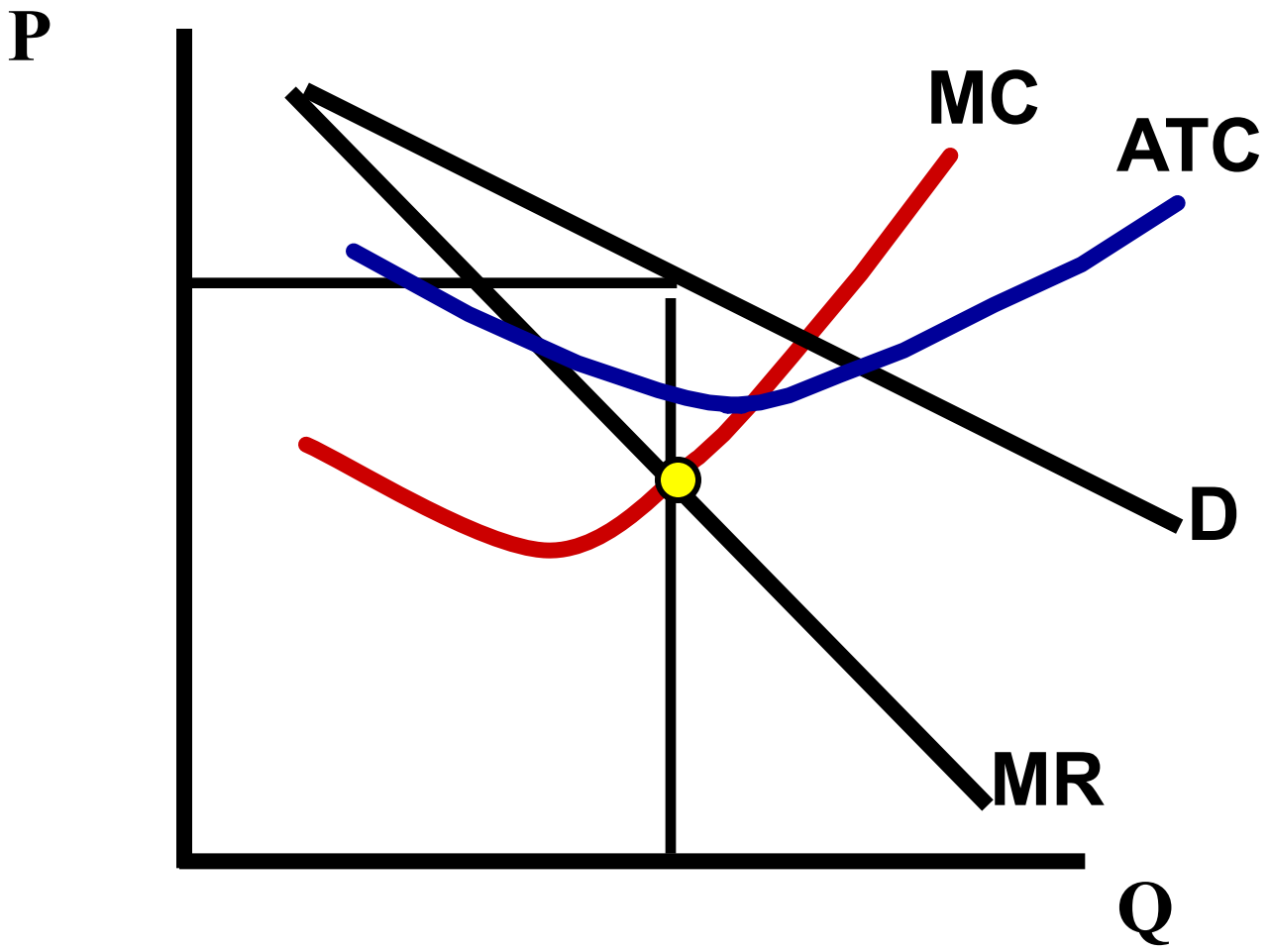
#2. Colluding Oligopolies

Cartel = Colluding Oligopoly

A cartel is a group of producers that create an agreement to fix prices high.

1. **Cartels set price and output at an agreed upon level**
2. **Firms require identical or highly similar demand and costs**
3. **Cartel must have a way to punish cheaters**
4. **Together they act as a monopoly**

Firms in a colluding oligopoly act as a monopoly and share the profit



#3.
Non-Colluding Oligopolies

Kinked Demand Curve Model

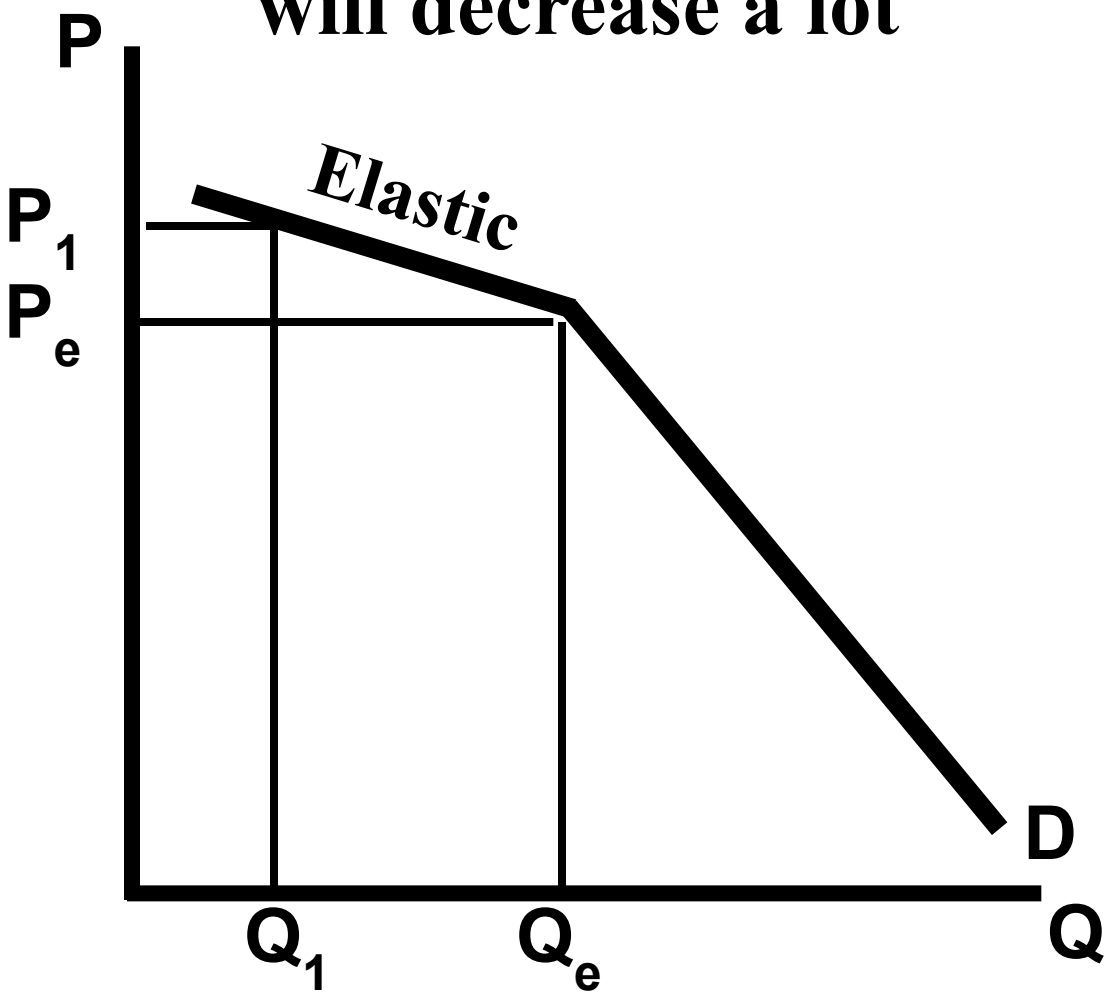
The kinked demand curve model shows how noncollusive firms are interdependent

If firms are NOT colluding they are likely to react to competitor's pricing in two ways:

1. **Match price-If one firm cuts it's prices, then the other firms follow suit causing inelastic demand**
2. **Ignore change-If one firm raises prices, others maintain same price causing elastic demand**

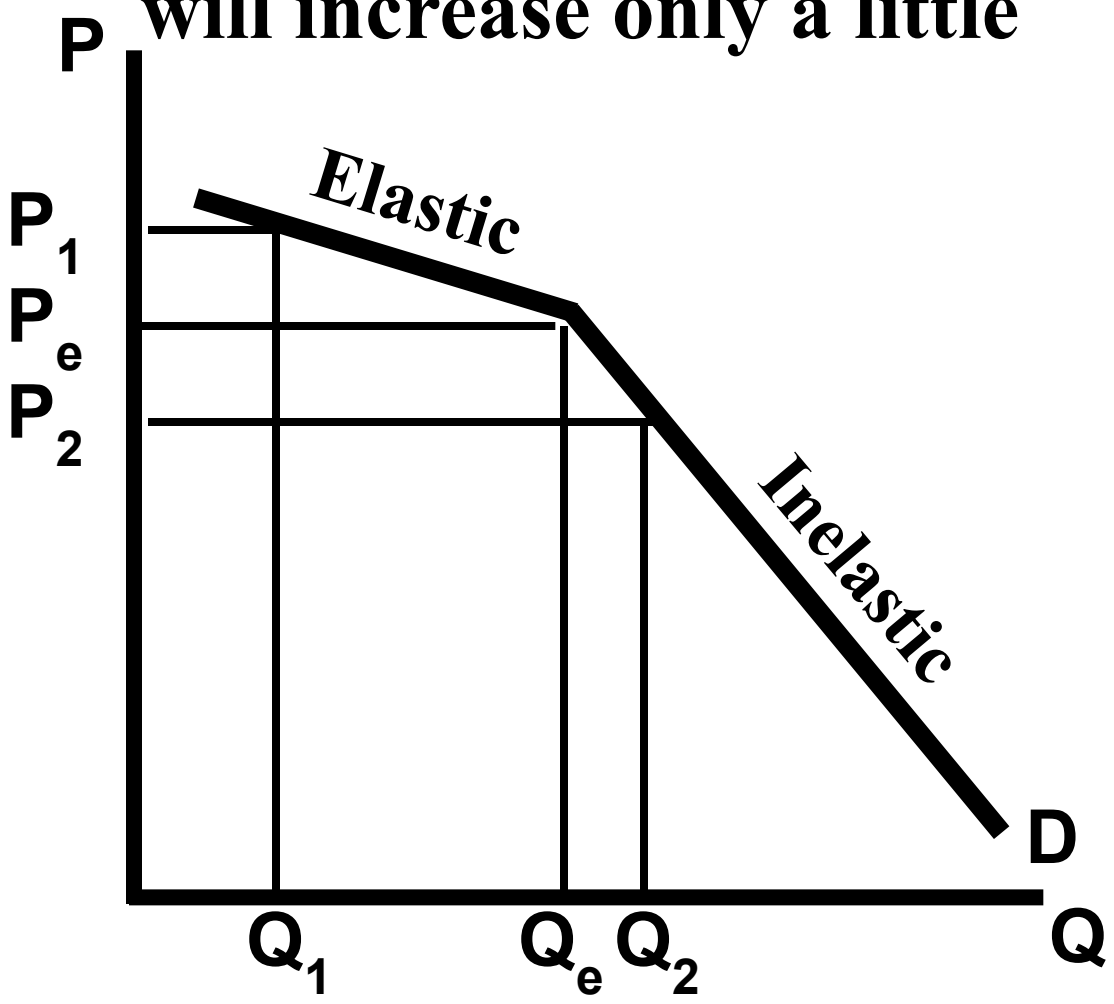
If this firm increases it's price, other firms will ignore it and keep prices the same

As the only firm with high prices, Qd for this firm will decrease a lot



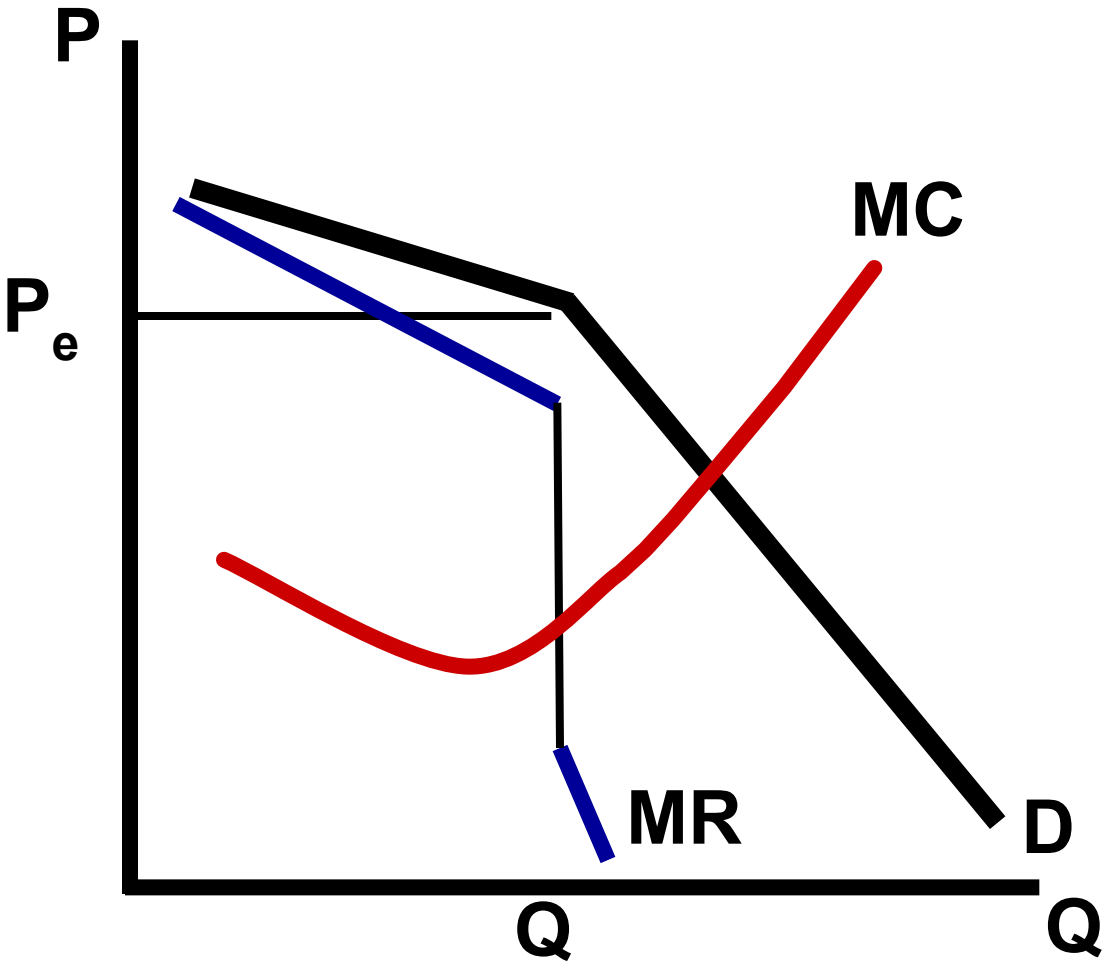
If this firm decreases it's price, other firms will match it and lower their prices

Since all firms have lower prices, Qd for this firm will increase only a little

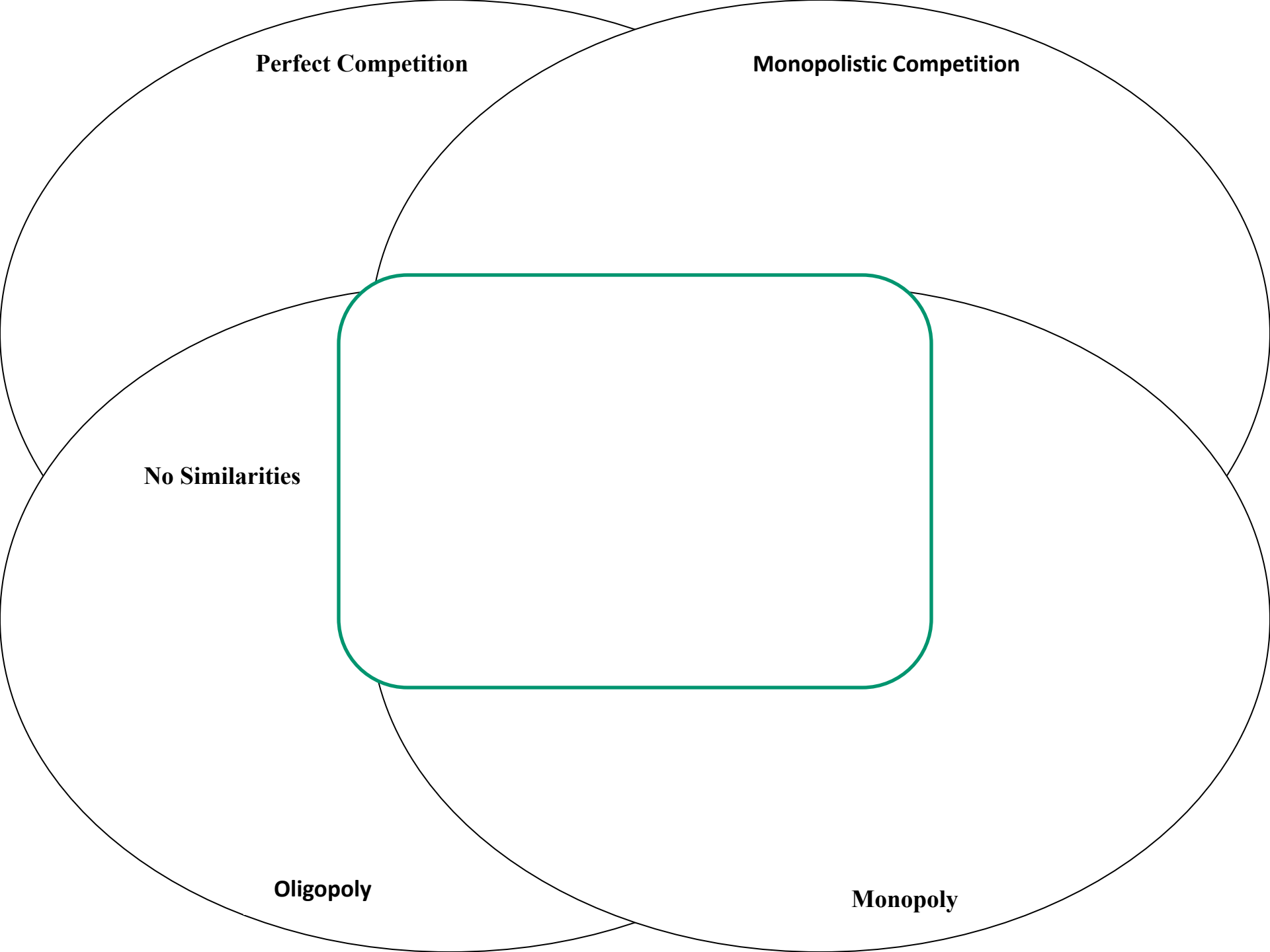


Where is Marginal Revenue?

MR has a vertical gap at the kink. The result is that MC can move and Q_e won't change. Price is sticky.

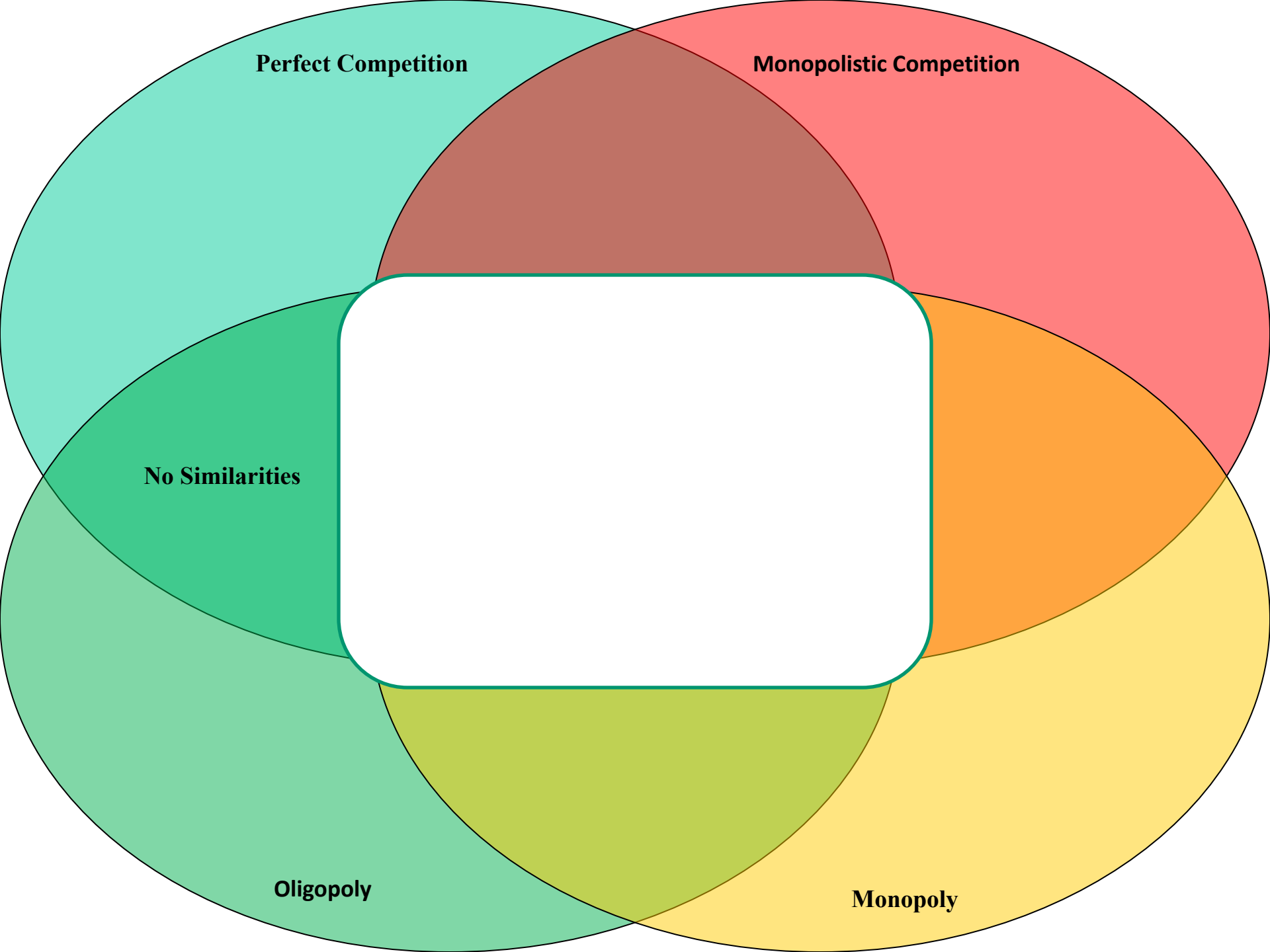


Market Structures Venn Diagram


Perfect Competition
Monopolistic Competition
No Similarities
Oligopoly
Monopoly

Name the market structure(s) that it is associated with each concept

1. MR=MC Rule
2. Price Maker (Demand > MR)
3. Collusion/Cartels
4. Identical Products
5. Price Taker (Demand = MR)
6. Excess Capacity
7. Low Barriers to Entry
8. Game Theory
9. Differentiated Products
10. Long-run Profits
11. Efficiency
12. Normal Profit
13. Dead Weight Loss
14. High Barriers to Entry
15. Firm = Industry


Perfect Competition
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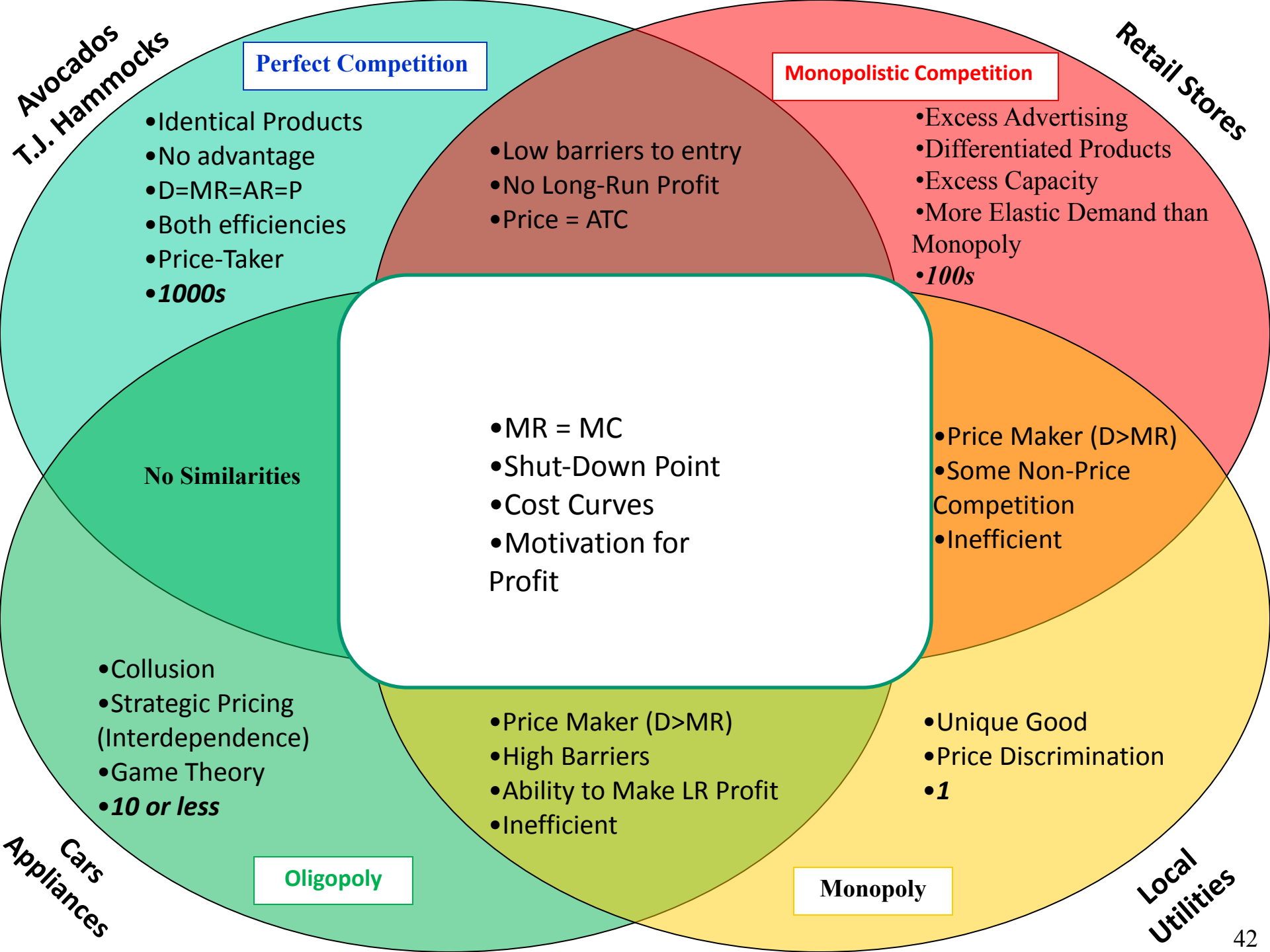
Avocados
T.J. Hammocks
Perfect Competition
•Identical Products
•No advantage
•D=MR=AR=P
•Both efficiencies
•Price-Taker
•1000s
Retail Stores
Monopolistic Competition
•Excess Advertising
•Differentiated Products
•Excess Capacity
•More Elastic Demand than Monopoly
•100s
•Low barriers to entry
•No Long-Run Profit
•Price = ATC
No Similarities
•MR = MC
•Shut-Down Point
•Cost Curves
•Motivation for Profit
•Price Maker (D>MR)
•Some Non-Price Competition
•Inefficient
•Collusion
•Strategic Pricing (Interdependence)
•Game Theory
•10 or less
•Price Maker (D>MR)
•High Barriers
•Ability to Make LR Profit
•Inefficient
•Unique Good
•Price Discrimination
•1
Cars
Appliances
Oligopoly
Monopoly
Local Utilities