

Units 2.3.4 and 2.3.5 Monopolistic Competition and Oligopoly

Unit Overview

2.3.4 - Monopolistic competition

- Assumptions of the model
- Short-run and long-run equilibrium
- Product differentiation
- Efficiency in monopolistic competition

2.3.5 - Oligopoly

- Assumptions of the model
- Collusive and non-collusive oligopoly
- Cartels
- Kinked demand curve as one model to describe interdependent behavior (IB HL only)
- Importance of non-price competition
- Theory of contestable markets (IB HL only)

 Blog posts: "Oligopoly"

 Blog posts: "Game Theory"

 Blog posts: "Collusion"

Monopolistic Competition

Characteristics and Occurrence

Definition: A market in which a relatively large number of sellers offer similar but not identical products.

- Each firm has a small but not insignificant percentage of the total market
- Collusion is impossible - too many firms to assure any agreements can be maintained.
- Firms act independently - one firm's pricing actions will only modestly affect other firms, if at all, since they each have such a small % of the market.

Product differentiation and nonprice competition: give the firms some degree of monopoly power that the purely competitive firm does not possess, **allows producers to have some control over the prices of their products.**

- Product differentiation may be physical (qualitative).
- Services and conditions accompanying the sale of the product are important aspects of product differentiation.
- Location is another type of differentiation.
- Brand names and packaging lead to perceived differences, aimed at gaining consumer loyalty.

Relatively easy entry and exit: If profits exist, new firms will enter the market. When losses are earned, firms will exit.

Advertising: Widely used to increase demand for an individual firm's product and make it less elastic (gives firm more market power)

Monopolistic Competition

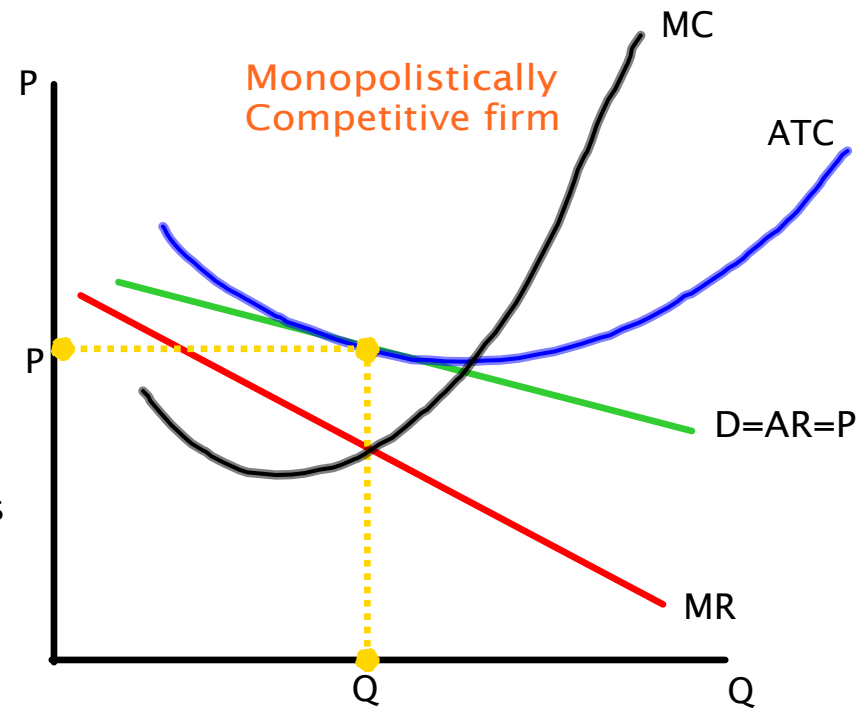
Price and Output Determination

Demand is downward sloping and MR lies below Price

- Because in order to sell additional units of output, a monopolistically competitive firm must lower the price of all previous units.
- The monopolistic competitor has some "price making power". If it raises its price it will lose many, but not all its customers to competitors producing a similar product.

Elasticity:

- Demand is more elastic than the monopoly's demand curve because the seller has many rivals producing close substitutes.
- Demand is less elastic than in pure competition, because the seller's product is differentiated from its rivals, so the firm has some control over price.



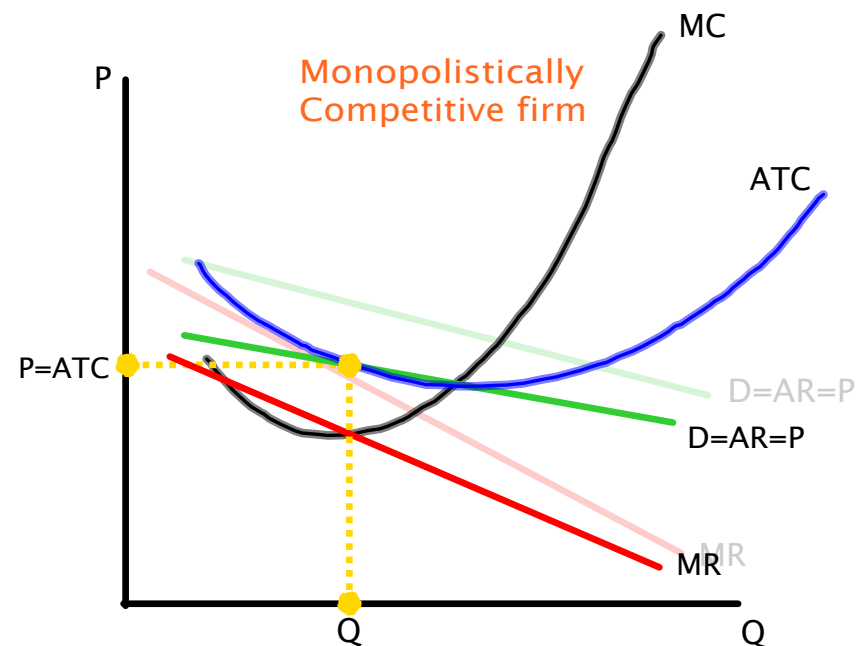
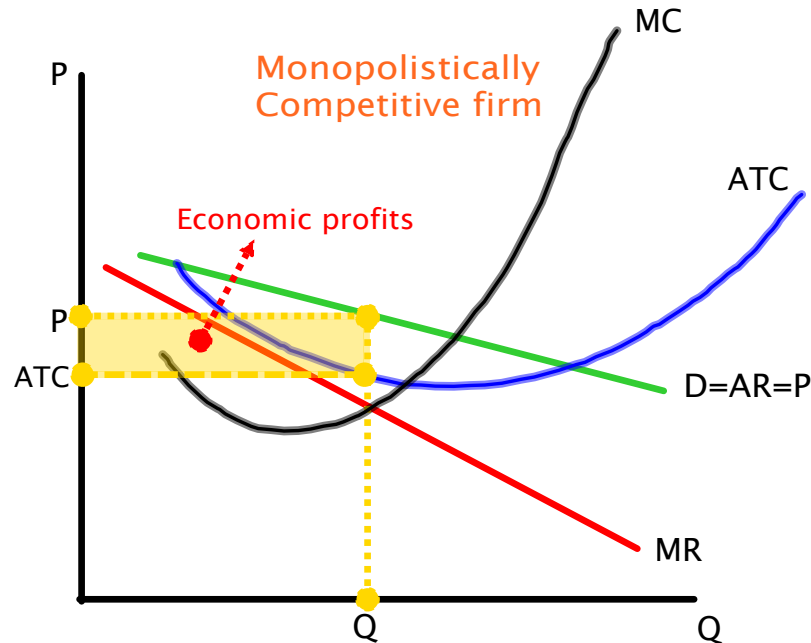
Profit maximizing level of output: $MR=MC$

- Monopolistic competitors will produce where $MR=MC$ to maximize total profits.
- Since MR is below price, the firm will produce less than the allocatively efficient level of output (allocative efficiency: $P=MC$)

Monopolistic Competition

Price and Output Determination

Entry eliminates profits:



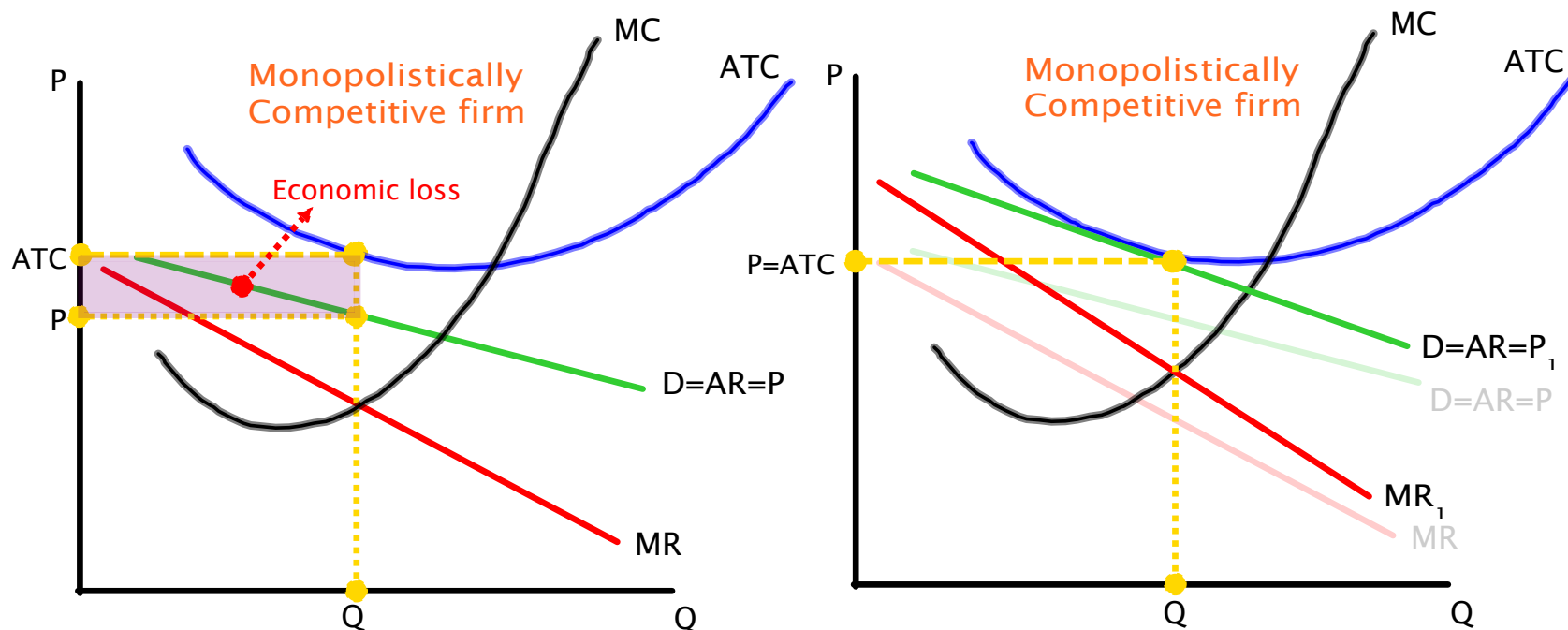
Firms will enter industry if economic profits are being earned.

- As new firms enter, demand for each existing firm's output decreases and becomes more elastic as there are more substitutes.
- Lower demand for each firm's output means lower price, output, and profits for existing firms
- In the long-run, entry of new firms eliminates profits. $P = ATC$, firms break even.

Monopolistic Competition

Price and Output Determination

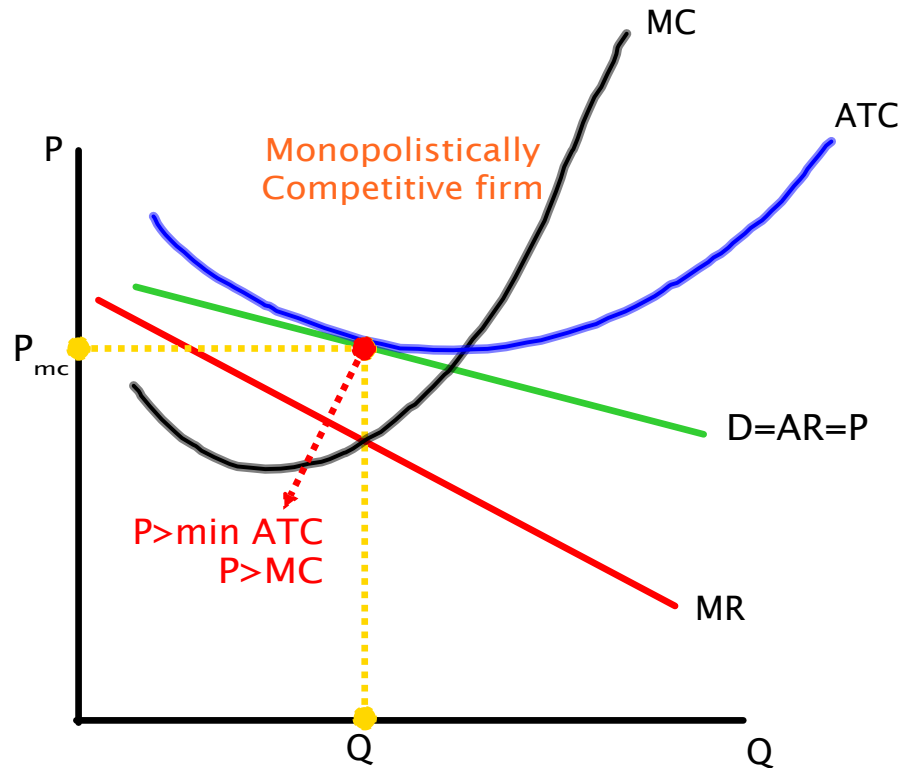
Exit eliminates losses:



Firms will leave the industry if the losses are being earned:

- If an individual firm experiences an increase in costs or a decrease in demand for its product, it may exit the industry.
- This will increase demand for each remaining firm (D to D_1) as there are fewer substitutes for buyers.
- As this happens, each firm will see its losses disappear until it reaches the break-even (normal profit) level of output and price.

Monopolistic Competition Impact on Efficiency



Do monopolistically competitive market achieve allocative efficiency?

Allocative efficiency: $P=MC$?

- NO - At the profit maximizing level of output, the price is greater than the MC
- This indicates that society would be better off if more resources were allocated towards this product

What about productive efficiency?

Productive efficiency: $P=\min. ATC$?

- NO - At the profit maximizing level of output, the price is slightly higher than the minimum ATC.
- Firms do not achieve maximum efficiency because the lack of perfect competitors allows them produce with less than maximum efficiency.

Monopolistic Competition

Evaluating the effects of MC

What are the pros and cons of Monopolistic Competition?

Cons:

- Because of the lack of competition, monopolistically competitive markets produce less than the socially optimal ($P=MC$) level of output.
- Price consumers pay will be higher than in more competitive markets, since competition does not force firms to produce and sell at their minimum average total cost.

Pros:

- Firms attempting increase demand for their product will innovate and differentiate their products in ways that benefit consumers: innovative features, customer service, warranties, etc...
- More product variety: since the products are differentiated, consumers get a variety of choices in a particular market. Examples: cell phones, restaurants, clothing, hotels, etc...

Conclusions?

The tradeoff of higher prices and lower output than would result from perfect competition is offset by the improvements in product quality and variety, which means consumers have more choices and opportunities to find exactly the product that suits their wants and needs.

Oligopoly

Characteristics and Occurrence

Definition: Oligopoly is a market in which a few large firms produce a homogeneous or differentiated product

Homogeneous OR differentiated products

- Oil is a product produced by a few large firms that is homogeneous. One firm's output is identical to all other firms.
- Laptop computers are a product produced by a few large firms that are differentiated. Sony's laptops have features that set them apart from Dell and HP's.

Interdependence of firms:

- Firms are mutually interdependent: each must consider its rivals' reactions in response to its decisions about prices, output, and advertising.
- Some oligopolistic industries produce *standardized products* (steel, zinc, copper, cement), whereas others produce *differentiated products* (automobiles, detergents, greeting cards).

Oligopoly

Characteristics and Occurrence

Barriers to entry exist: Significant barriers to entry keep the number of firms small and allow oligopolists to earn economic profits in the long-run.

- **Economies of scale:** may exist due to technology and market share. The capital investment requirement may be very large. Example: Airbus and Boeing
- **Other barriers to entry:** Legal barriers could include patents, copyrights, trademarks. Control of raw materials could prevent other firms from entering a market, preemptive and retaliatory pricing might be used to compete new firms out of the market, traditional brand loyalty may make new entry difficult.
- **Mergers:** Already large firms may merge to increase market share and concentrate power. Mergers are common among large monopolistic firms as they give firms more power over output and price.

Measuring industry concentration

- **Concentration ratio:** Used to measure market dominance.
- **The four-firm concentration ratio** gives the percentage of total industry sales accounted for by the four largest firms.
- *When the largest four firms in an industry control 40% or more of the market, that industry is considered oligopolistic.*
- Concentration tells us nothing about the actual market performance of various industries in terms of how vigorous the actual competition is among existing rivals

Oligopoly

Demand in an Oligopoly

Non-collusive oligopoly: The following applies only to a non-collusive oligopoly, in which firms do NOT cooperate in price and output decisions, but make decisions based on the actions of their competitors.

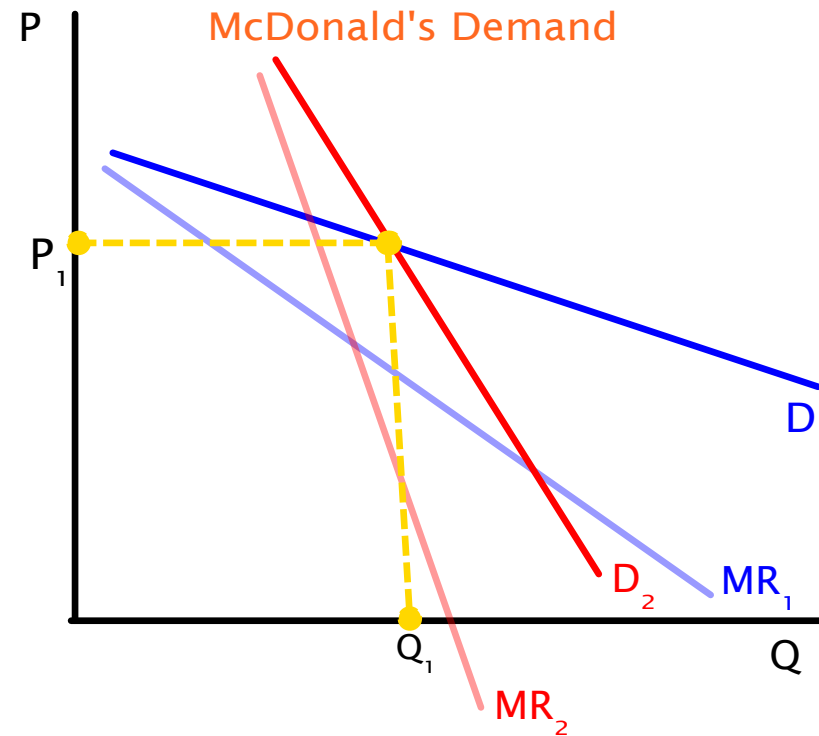
2 firms in the Zurich fast food market:
McDonald's and Burger King

D_1 and MR_1 : Represent consumer demand for McD's assuming BK ignores price changes.

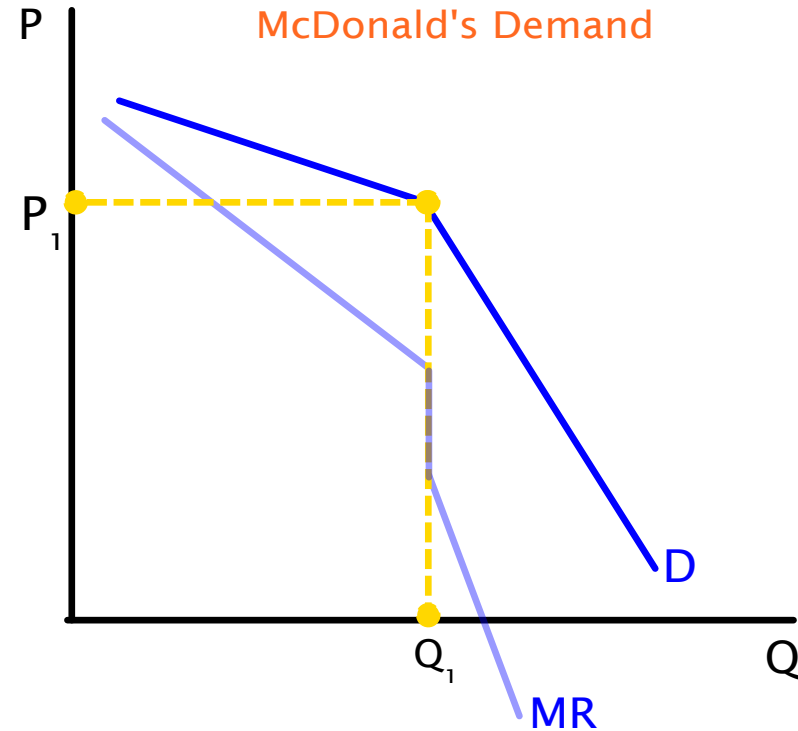
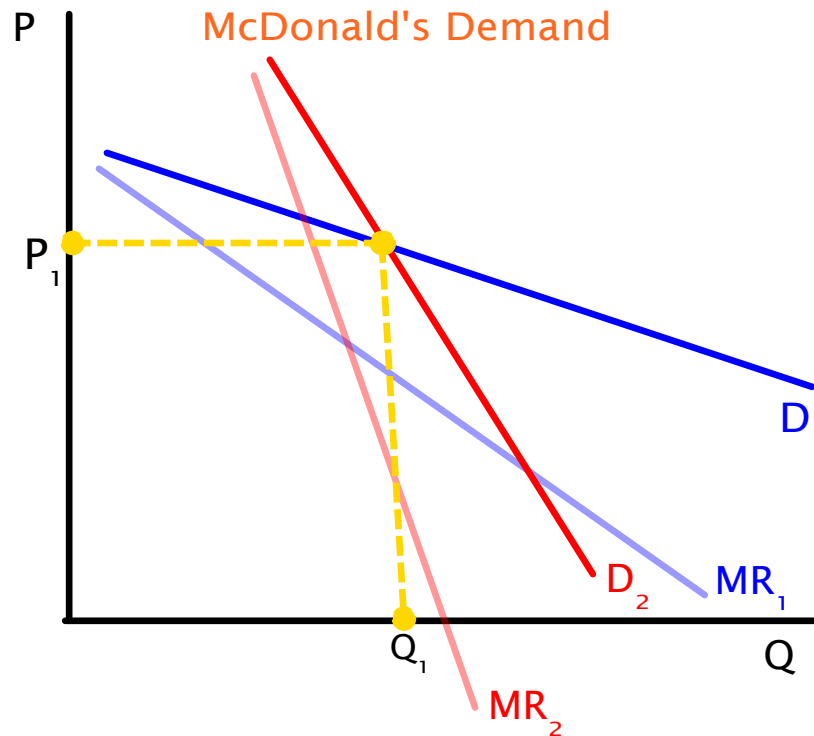
- D_1 is highly elastic because if McD's lowers its price and BK does not, many consumers will switch from BK to McD's.
- If McD's increases price and BK does not, McD's will lose many customers.

D_2 and MR_2 : Represent demand for McD's assuming BK matches price changes.

- D_2 is highly inelastic because if McD's lowers its prices, so will BK so it will not gain many new customers.
- If McD's increases its prices, so does BK, so demand for McD's hardly changes.



Oligopoly the Kinked Demand Curve



Assumptions:

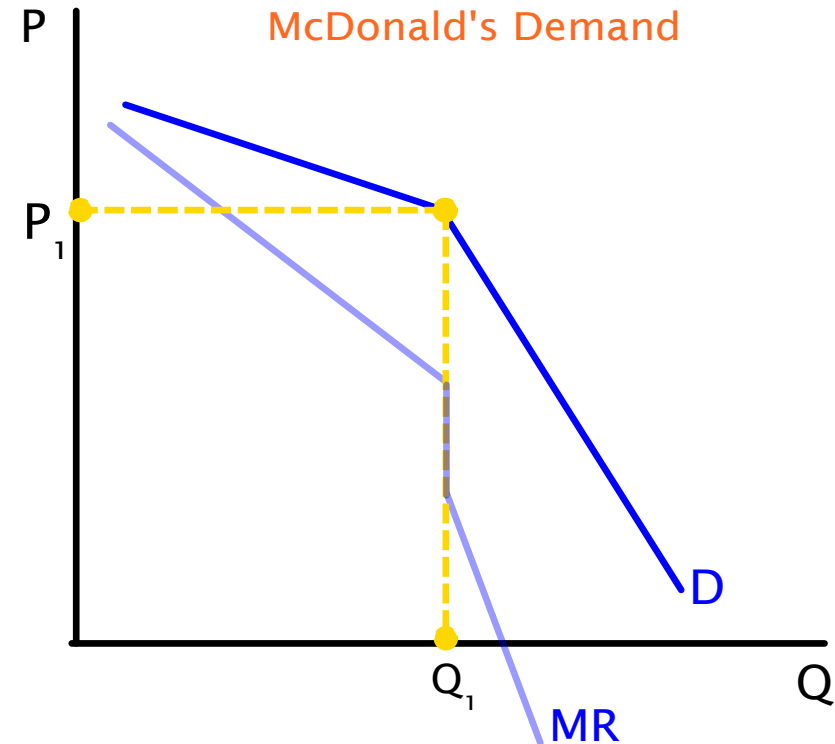
- BK will match a price decrease by McD's so as to not lose market share
- BK will ignore a price increase by McD's so it can capture customers who will switch to BK.
- D_1 represents demand when McD's increases price, D_2 when it lower price.
- Put together, the demand curve faced by a monopolist is kinked, highly elastic above current price and highly inelastic below current price

Oligopoly the Kinked Demand Curve

Implications of kinked demand:

Price is "sticky" upwards: An oligopolist has little incentive to increase price because it will lose market share to competitors and experience a substantial decline in quantity demanded.

Price is "slippery" downwards: An oligopolist is reluctant to lower its price because a "price war" could result, in which all firms are forced to lower their prices, adversely affecting marginal revenue possibly resulting in losses.



Conclusions: In order to lower price a firm must increase its output, which means higher costs. Since demand is inelastic beyond Q_1 , the firm's total revenue will fall as it increases output beyond this point while its total costs increase, meaning profits will decrease. The result is that price tends to remain fairly stable in oligopolistic markets. Raising prices by decreasing output and lowering them by increasing output can both harm the firm.

Oligopoly

Introduction to Game Theory

What is game theory?

Game theory studies the behavior of firms in an oligopoly from the perspective of a game. Firms are the "players" that can make "moves". Depending on the moves firms make, they may end up being winners or losers.

A simple game - the "Prisoner's Dilemma"

Introduction: *Two thieves have been caught by the cops.*

- There is not enough evidence to convict them of the crime of assault, which the prosecutor suspects they committed.
- But the prosecutor has enough evidence to convict them of breaking and entering, a minor one for which the sentence is only 1 year. So the prosecutor must try to get them to confess to the more serious crime.

Rules of the game: The prisoners are placed in two separate interrogation rooms and not allowed to communicate with one another. Each prisoner is given the following choices:

- *If you confess to assault and your accomplice does not, you will go free and your stubborn accomplice will receive 20 years in jail.*
- *If you both confess you will both serve three years in jail.*

Oligopoly

Game Theory: the Prisoner's Dilemma

The Dilemma:

- If both prisoners remain silent, the prosecutor can only convict them for the minor offense, in which case they'll each receive one year in jail.
- But if one confesses and the other does not, the one who remained silent will get 10 years in jail, and he knows this. This creates a major incentive to confess, as 10 years is a LONG TIME!
- *Assuming the prisoners are both rational, self-interested individuals, the most likely "move" the "players" will make is to confess, meaning they both end up getting 3 years in jail.*

The players, moves, and possible outcomes of the game can be plotted in a "payoff matrix"

- The "players": Prisoner 1 and Prisoner 2
- The "moves": Confess or Remain silent
- The "payoffs": possible jail terms resulting from various "moves" by players

		Prisoner 1	
		remain silent	confess
Prisoner 2	remain silent	-1	-10
	confess	-10	-3

Oligopoly

Game Theory: the Prisoner's Dilemma

Playing the Game:

Assuming both players know all possible outcomes, which "move" will the prisoners make?

If Prison 1 **remains silent**, what should Prisoner 2 do?

Remain silent Confess

If Prison 1 **confesses**, what should Prisoner 2 do?

Remain silent Confess

		Prisoner 1	
		remain silent	confess
Prisoner 2	remain silent	-1	0
	confess	-10	-3

What is Prisoner 2's "dominant strategy"?
Remain silent Confess

What is Prisoner 1's "dominant strategy"?
Remain silent Confess

Oligopoly

Game Theory: the Prisoner's Dilemma

Do the players in the Prisoner's Dilemma have a "dominant strategy"?

- If one move minimizes losses or maximizes winnings regardless of what the other player does, this is a "dominant strategy"
- The players will examine the possible moves by his opponent, and ask "what move will make me better off based on my opponent's move?"
- In the Prisoner's Dilemma game, both players have a dominant strategy: **CONFESS**. Because if either player remains silent, they can always do better by confessing regardless of what the other player does.
- The incentive to confess is too strong. Since the prisoners cannot communicate with one another, they cannot agree to remain silent, which would result in a better outcome for both prisoners.

Blog post: "Golden Balls: Game Theory, the Prisoner's Dilemma, and the cold rationality of human behavior!"



Oligopoly

Game Theory: Oligopoly Behavior

Oligopoly behavior is similar to a game:

- Each player's action is *interdependent* with other players' actions.
- Depending on what one firm does, it will have a major impact on the profits or losses of other firms.

The "players" are the firms: Two coffee shops, Starbucks and San Francisco Coffee.

The "moves" are the actions the firms can take: The coffee shops can either advertise around town or not advertise.

The "payoffs" are the profits the firms will earn: Advertising increases firms' costs, but can also increase revenues.

		Starbucks	
		don't advertise	advertise
SF Coffee	don't advertise	\$15 / \$15	\$20 / \$10
	advertise	\$20 / \$10	\$12 / \$12

Oligopoly

Game Theory: Oligopoly Behavior

Does Starbucks have a dominant strategy?

Advertise Don't advertise None

Does SF Coffee have a dominant strategy?

Advertise Don't advertise None

What will be the equilibrium outcome of this game?

		Starbucks	
		don't advertise	advertise
SF Coffee	don't advertise	\$15 / \$15	\$20 / \$10
	advertise	\$20 / \$10	\$12 / \$12

Questions:

- If collusion were possible, what strategy would the two firms agree on?
- Why is it unlikely a collusive agreement will be maintained?
- How does the payoff matrix illustrate interdependence among oligopolistic firms?
- Why does this model represent a dilemma for these firms?

Oligopoly

Price Leadership and Price Wars

An alternative to overt collusion, Price Leadership: When there exists an implicit understanding by which oligopolists can coordinate prices

- Usually a "*dominant firm*" (typically the largest in the industry) establish the price and smaller firms follow.
- Prices tend to be "*sticky*" upwards, since firms are hesitant to raise their prices and lose market share to rivals.
- However, prices are "*slippery*" downwards, which means if one firm lowers its prices, others will follow suit so they don't lose all their business.

Price Wars: When agreements break down, firms may engage in price wars, in which they continually lower their prices and increase output in order to try and attract more customers than their rivals.

- This can cause sudden increases in output and decreases in price, *temporarily approaching an efficient level*.
- Once firms realize low prices hurt everyone, price leadership is usually restored, and prices rise once more.

Oligopoly

Practice Free Response Question

Two Pizzerias, Luigi's and Mario's, provide all the pizza in the village of Wangi. They must order their menus from the printing company at the beginning of the year and cannot alter the prices on their menus during that year. The prices on the menus are revealed to the public and to the competition only after both companies have received the printed menus from the printer and put them up in the window. Each pizzeria must choose between a high price and a low price for its "supremo-premium pie", the deluxe pizza that the people of Wangi are most eagerly anticipating.

The payoff matrix showing the profits that the two firms will experience appears below, with the first entry in each cell indicating Luigi's weekly profit and the second entry in each cell indicating Mario's weekly profit.

		Mario's Pizzeria	
		high price	low price
Luigi's Pizzeria	high price	\$1,000/\$700	\$700/\$600
	low price	\$750/\$950	\$900/\$800

- (a) In which market structure do these firms operate? Explain.
- (b) If Mario's chooses a low price, which price is better for Luigi's
- (c) Identify the dominant strategy for Mario's
- (d) Is choosing a low price a dominant strategy for Luigi's? Explain.
- (e) If both firms know all the information in the payoff matrix but do not cooperate, what will be Mario's daily profit?