Lecture 7

Oligopoly & Monopolistic competition

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Presentation is based on:
http://www.swlearning.com/economics/mankiw/mankiw3e/powerpoint_micro.html

Between monopoly and perfect competition

Monopolistic competition	Oligopoly	Duopoly	Monopoly

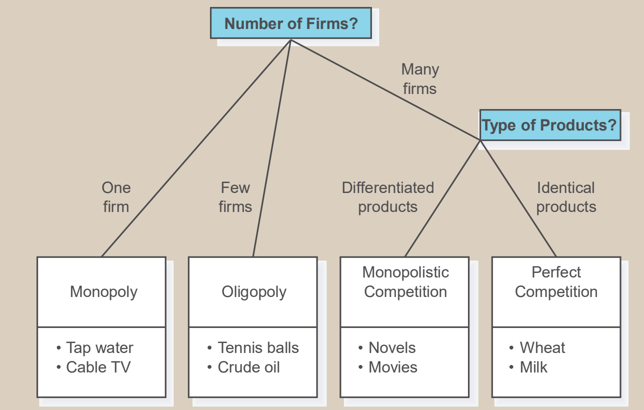
The market power increases →

Imperfect competition refers to those market structures that fall between perfect competition and pure monopoly.

Between monopoly and perfect competition

- Types of Imperfectly Competitive Markets
  - *Oligopoly*
    - Only a *few sellers*, each offering a similar or identical product to the others.
    - Because of the few sellers, the key feature of oligopoly is the tension between cooperation and self-interest.
  - *Monopolistic Competition*
    - *Many firms* selling products that are similar but not identical.

The Four Types of Market Structure



Illusion of a free,competitive market

Oligopoly

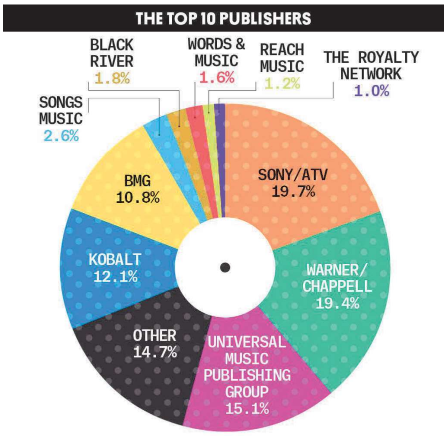
Oligopoly

- Oligopoly:
  - Few sellers offering similar or identical products
  - Interdependent firms
  - Best off cooperating and acting like a monopolist by producing a small quantity of output and charging a price above marginal cost (P > MC)
- It can be:
  - Natural: barriers of entrance
  - Legal: legal barriers of entrance
  - Illegal: cartel.

Some examples

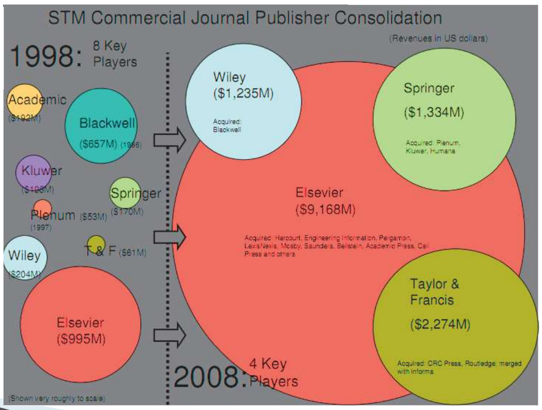
- 6 major book publishers – Random House, Pearson, Hachette, HarperCollins, Simon & Schuster and Holtzbrinck
- 4 breakfast cereal manufacturers – Kellogg, General Mills, Post and Quaker
- 2 major producers in the beer industry – Anheuser-Busch and MillerCoors
- 2 major providers in the healthcare insurance market – Anthem and Kaiser Permanente

Music publishers in 2015



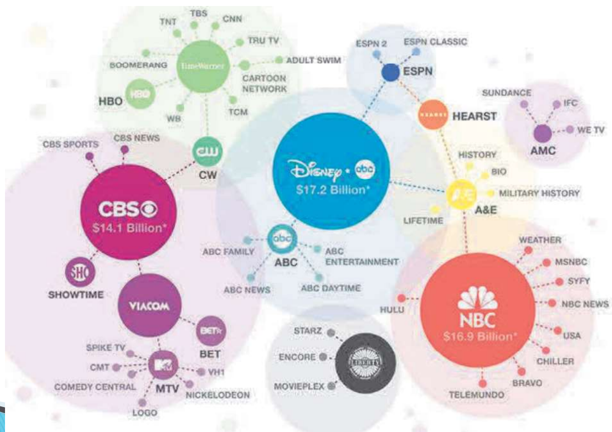
http://www.billboard.com/articles/business/6670986/publishers-q2-report-sony-atv-warner-chappell-universal-kobalt

Scientific publishers…

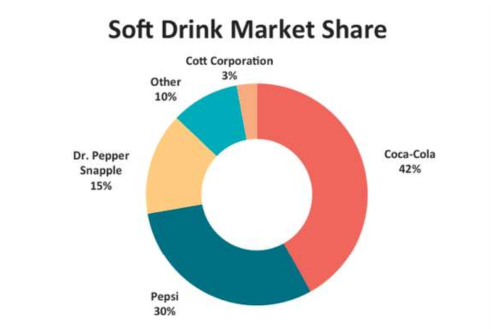


http://www.sciencealert.com/these-five-companies-control-more-than-half-of-academic-publishing

TV stations and publishers



Market for soft drinkgs in 2016



https://www.fool.com/investing/general/2014/08/25/soft-drinks-investing-essentials.aspx

Market concentration index

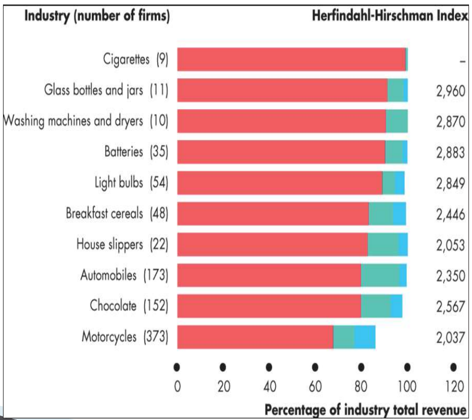
- The Herfindahl–Hirschman index (HHI) is a commonly accepted measure of market concentration.
- It is calculated by squaring the market share of each firm competing in a market, and then summing the resulting numbers, and can range from close to zero (for perfect competition) to 10,000 (for monopoly).

read more at: http://www.investopedia.com/terms/h/hhi.asp

HHI: examples

- Perfectly competitive market, 100 firms, each has1% share in the market:
  $$1^2 + ... + 1^2 = 100$$
- Monopoly with 100% share in the market:
  $$100^2 = 10000$$
- Two companies with a similiar share in the market: $50^2 + 50^2 = 5000$
- Market with HHI above 1000 is an oligopoly…

HHI: examples of oligopolies



Duopoly

- A situatuon in which two companies own all or nearly all of the market for a given product or service.
- It is the simplest type of oligopoly.
- Digital advertising: Google and Facebook are an advertising duopoly with an 85% market share between themselves.

http://hightechforum.org/overcoming-the-advertising-duopoly/

The Demand Schedule for Water

MC = 0, hence TR=TP

what would be a price and quantity supplied if it was:
a) perfect competition
b) monopoly?

Quantity (in gallons)	Price	Total Revenue (and total profit)
0	$120	$ 0
10	110	1,100
20	100	2,000
30	90	2,700
40	80	3,200
50	70	3,500
60	60	3,600
70	50	3,500
80	40	3,200
90	30	2,700
100	20	2,000
110	10	1,100
120	0	0

Conclusion

- Price and Quantity Supplied
  - The socially efficient quantity of water is 120 gallons, but a monopolist would produce only 60 gallons of water.
  - So what outcome then could be expected from duopolists?

- The duopolists may agree on a monopoly outcome.
  - *Collusion*
    - An agreement among firms in a market about quantities to produce or prices to charge.
  - *Cartel*
    - A group of firms acting in unison.

The Demand Schedule for Water

Each producer has to take into account the decisions of his competitor….

Producers may agree to supply 60l together (30l each of them), gaining 1800 $.

Quantity (in gallons)	Price	Total Revenue (and total profit)
0	$120	$ 0
10	110	1,100
20	100	2,000
30	90	2,700
40	80	3,200
50	70	3,500
60	60	3,600
70	50	3,500
80	40	3,200
90	30	2,700
100	20	2,000
110	10	1,100
120	0	0

The Equilibrium for an Oligopoly

- When firms in an oligopoly individually choose production to maximize profit, they produce quantity of output greater than the level produced by monopoly and less than the level produced by competition.

But what if there is no agreement between them, and they start to produce more than 30l each?

Nash equilibrium

- A situation when each of the producers is delivering 40l establishes a balance on the market…

Nash equilibrium is a situation in which economic actors interacting with one another each choose their best strategy given the strategies that all the others have chosen.

Equilibrium for an Oligopoly

- Summary
  - Possible outcome if oligopoly firms pursue their own self-interests:
    - Joint output is greater than the monopoly quantity but less than the competitive industry quantity.
    - Market prices are lower than monopoly price but greater than competitive price (=MC).
    - Total profits are less than the monopoly profit.

The Demand Schedule for Water

The output effect: Because price is above marginal cost, selling more at the going price raises profits.

The price effect: Raising production will increase the amount sold, which will lower the price and the profit per unit on all units sold.

Quantity (in gallons)	Price	Total Revenue (and total profit)
0	$120	$ 0
10	110	1,100
20	100	2,000
30	90	2,700
40	80	3,200
50	70	3,500
60	60	3,600
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How the Size of an Oligopoly Affects the Market Outcome

- As long as the output effect > the price effect, it is beneficial to increase the production
- In other case, it has no sense.
- Each of the firms is increasing the production till both effects are equal (by the assumption that the number of firms is fixed).

How the Size of an Oligopoly Affects the Market Outcome

- As the number of sellers in an oligopoly grows larger, an oligopolistic market looks more and more like a competitive market.
- The price approaches marginal cost (MC), and the quantity produced approaches the socially efficient level.

Oligopolistic strategies

- Collision, cartel, lack of agreement…

Oligopolistic strategies

1. No agreement: each of the firms decides about the price and the output and doesn't take into the account the decisions of the competitors.

- The firms may decrease the prices to increase their market share (price war)!
- Predatory pricing is the act of setting prices low in an attempt to eliminate the competition.
- Predatory pricing is illegal under anti-trust laws.

Oligopolistic strategies

2. The firms accept their interdependece and agree which one is the price leader:

- Leadership of a dominating company (the largest share in the market)
- Leadership of the company with the lowest production costs

Price leadership

- A firm has such a big share in the market, that may control the development of the market
- Rest of the firms are relatively small
- The dominating company establishes the price of the products and allows others firms to sell at this price level as much as they can.
- Price leadership can be:
  - Dominant
  - Barometric
  - Agreesive

Price leadership

- The dominant organization is treated as price leader because of various reasons, such as:
  - large size of the organization,
  - large economies of scale, and
  - advanced technology.

Ledership of a company with the lowest cost

- The company with the lowest costs dominates on the market
- The rest of the companies sell by the established price and their profits depend on the difference between their production costs and the costs of the dominating company.

Examples: leadership of a company with the lowest cost

- Walmart – (effective distribution and logistic system → „Always low prices”)
- McDonald (low labor cost, low price)
- IKEA (cheap furnitures, effective system distrbution and sales)
- Cheap airlines (e.g. Rynair)

Oligopolistic strategies

3. The firms agree to cooperate and have larger profits.

- Oligopolists maximize their total profits by forming a cartel and acting like a monopolist.

Collision/ cartel...

- *collision*
  - An agreement between firms regarding the price and the quantity supplied.
- *cartel*
  - A cartel is a group of similar, **independent companies** which join together to fix prices, to limit production or to share markets or customers between them.

Antitrust laws

- Antitrust laws make it illegal to restrain trade or attempt to monopolize a market.
- Anti-trust law of the EU decides which agreements are legal:
  - The common share of the market is lower than 5%
  - It doesn't hurt the hard-core restriction (the individual share of each firm associated in the gropu is lower than 10%)

http://ec.europa.eu/competition/cartels/overview/index_en.html

Antitrust Policy

- Resale Price Maintenance (or fair trade)
  - occurs when suppliers (like wholesalers) require retailers to charge a specific amount
- Predatory Pricing
  - occurs when a large firm begins to cut the price of its product(s) with the intent of driving its competitor(s) out of the market
- Tying
  - when a firm offers two (or more) of its products together at a single price, rather than separately

Following practices are forbidden:

- Price fixing
- Output fixing
- Share agreement
- Auction agreement

http://lexplay.pl/artykul/Prawo-Dzialalnosci-Gospodarczej/sad_ochrony_konkurencji_i_konsumentow1

http://tvn24bis.pl/z-kraju,74/nowe-prawo-antymonopolowe-wysokie-kary-za-kartel-urzad-ostrzeze-przed-nieuczciwymi-reklamami,506996.html

Examples of cartles

- OPEC (output fixing)
- Viatmins cartel (price fixing), m.in. Hoffman-La Roche, BASF (https://www.youtube.com/watch?v=Q1kkKISloRs)
- Producers of building materials (Lafarge, BPB, Knauf i Gyproc)
- Car window glass (e.g.Pilkington)
- Gas switchboards (e.g. Siemens AG)
- Synthetic rubber (e.g. Eni SpA)
- Elavators (e.g.Otis)
- Batteries for mobile phones (Sony, Panasonic, Samsung i Sanyo)

Fines for Polish cartels

Firm	Fine (in m. PLN)
Concrete producers: Grupa Ożarów, Cemex Polska, Dycerhoff Polska, Cementownie Warta & Odra	339
Ruch, Franpress i Rolkon – distribution of press	10
Johnson & Johnson Poland & pharmacetigal distributor Compol & Hurtofarm	3,8
Publisher and distributors of polish edition of Harry Potter & Fenix order	1,6
Pharmaceutigal company Roche Polska & its distributor Hand-Prod	0,306

source: Ewelina Nojszewska, Podstawy Ekonomii, WSiP, 2010

What does EU in case of cartels?

- film

http://ec.europa.eu/competition/consumers/index_en.html

Elements of the game theory

Game theory and the economics of cooperation

- Game theory is the study of how people behave in strategic situations.
- Strategic decisions are those in which each person, in deciding what actions to take, must consider how others might respond to that action.

Game theory and the economics of cooperation

- Because the number of firms in an oligopolistic market is small, each firm must act strategically.
- Each firm knows that its profit depends not only on how much it produces but also on how much the other firms produce.

The Prisoners' Dilemma

- The *prisoners' dilemma* provides insight into the difficulty in maintaining cooperation.
- Often people (firms) fail to cooperate with one another even when cooperation would make them better off.

The Prisoners' Dilemma

Clyde's Decision	Bonnie's Decision: Confess	Bonnie's Decision: Remain Silent
Confess	Bonnie gets 8 years / Clyde gets 8 years	Bonnie gets 20 years / Clyde goes free
Remain Silent	Bonnie goes free / Clyde gets 20 years	Bonnie gets 1 year / Clyde gets 1 year

"Right now, we can lock you up for 1 year. If you confess to the bank robbery and implicate your partner, however, we'll give you immunity and you can go free. Your partner will get 20 years in jail. But if you both confess to the crime, we won't need your testimony and we can avoid the cost of a trial, so you will each get an intermediate sentence of 8 years."

The Prisoners' Dilemma

Clyde's Decision	Bonnie's Decision: Confess	Bonnie's Decision: Remain Silent
Confess	Bonnie gets 8 years / Clyde gets 8 years	Bonnie gets 20 years / Clyde goes free
Remain Silent	Bonnie goes free / Clyde gets 20 years	Bonnie gets 1 year / Clyde gets 1 year

Dominant strategy for each of a player: **to confess** (options: go free or get 8 years) →
A strategy that gives the best result no matter what the rival will do

The Prisoners' Dilemma

- The *dominant strategy* is the best strategy for a player to follow regardless of the strategies chosen by the other players.
- Cooperation is difficult to maintain, because cooperation is not in the best interest of the individual player.

An Oligopoly Game

Iran's Decision	Iraq's Decision: High Production	Iraq's Decision: Low Production
High Production	Iraq gets $40 billion / Iran gets $40 billion	Iraq gets $30 billion / Iran gets $60 billion
Low Production	Iraq gets $60 billion / Iran gets $30 billion	Iraq gets $50 billion / Iran gets $50 billion

An Advertising Game

		Marlboro's Decision	
		Advertise	**Don't Advertise**
Camel's Decision	**Advertise**	Marlboro gets $3 billion profit; Camel gets $3 billion profit	Marlboro gets $2 billion profit; Camel gets $5 billion profit
	Don't Advertise	Marlboro gets $5 billion profit; Camel gets $2 billion profit	Marlboro gets $4 billion profit; Camel gets $4 billion profit

Oligopolies as a Prisoners' Dilemma

- Self-interest makes it difficult for the oligopoly to maintain a cooperative outcome with low production, high prices, and monopoly profits.
- Firms that care about future profits will cooperate in repeated games rather than cheating in a single game to achieve a one-time gain.

The demand schedule for water

What happens if the same game repeats every week?
The producers know what will happen if any of them breakes the agreement….

Quantity (in gallons)	Price	Total Revenue (and total profit)
0	$120	$ 0
10	110	1,100
20	100	2,000
30	90	2,700
40	80	3,200
50	70	3,500
60	60	3,600
70	50	3,500
80	40	3,200
90	30	2,700
100	20	2,000
110	10	1,100
120	0	0

Figure 7 Jack and Jill Oligopoly Game

Quantity (in gallons)	Price	Total Revenue (and total profit)
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50	70	3,500
60	60	3,600
70	50	3,500
80	40	3,200
90	30	2,700
100	20	2,000
110	10	1,100
120	0	0

		Jack's Decision	
		Sell 40 Gallons	**Sell 30 Gallons**
Jill's Decision	**Sell 40 Gallons**	Jack gets $1,600 profit; Jill gets $1,600 profit	Jack gets $1,500 profit; Jill gets $2,000 profit
	Sell 30 Gallons	Jack gets $2,000 profit; Jill gets $1,500 profit	Jack gets $1,800 profit; Jill gets $1,800 profit

Summary

- Cooperation among oligopolists is undesirable from the standpoint of society as a whole because it leads to *production that is too low* and *prices that are too high*.
- Oligopolists maximize their total profits by forming a cartel and acting like a monopolist.
- If oligopolists make decisions about production levels individually, the result is a greater quantity and a lower price than under the monopoly outcome.

Monopolistic competition

Monopolistic Competition

- Attributes of Monopolistic Competition
  - Many sellers
  - Product differentiation
  - Free entry and exit

Monopolistic Competition

- Many Sellers
  - There are many firms competing for the same group of customers.
    - Product examples include: books, CDs, movies, computer games, restaurants, piano lessons, cookies, furniture, etc.

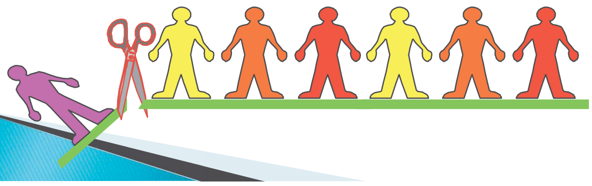
Monopolistic Competition

- Product Differentiation
  - Each firm produces a product that is at least *slightly different* from those of other firms.
  - Rather than being a price taker, each firm faces a *downward-sloping demand curve*.

https://commons.wikimedia.org/wiki/File:Toothbrush_x3_20050716_002.jpg

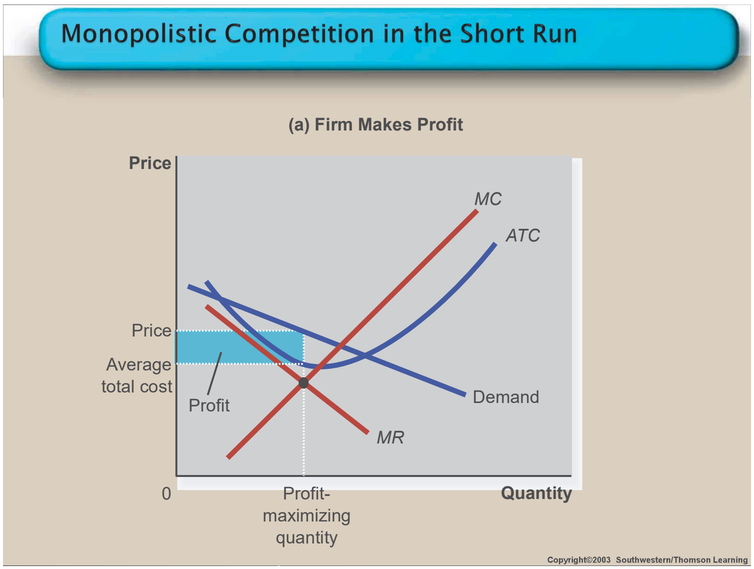
Monopolistic Competition

- Free Entry or Exit
- Firms can enter or exit the market without restriction.
- The number of firms in the market adjusts until economic profits are zero.



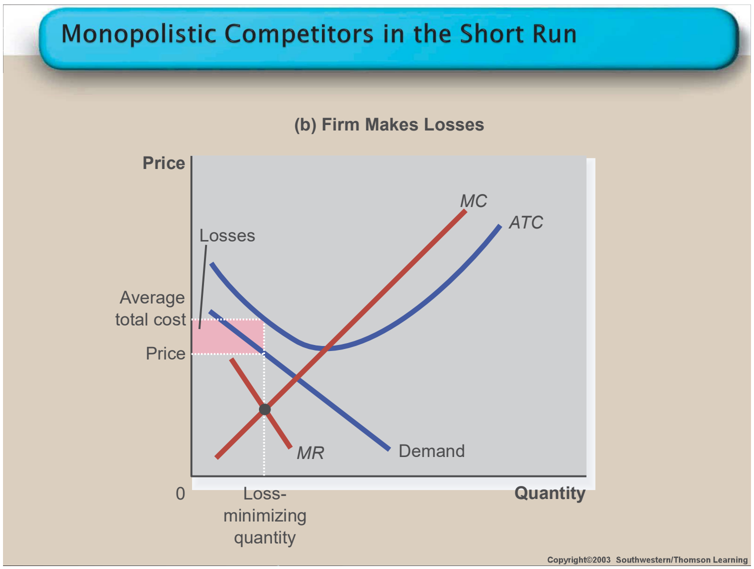
Competition with differentiated products

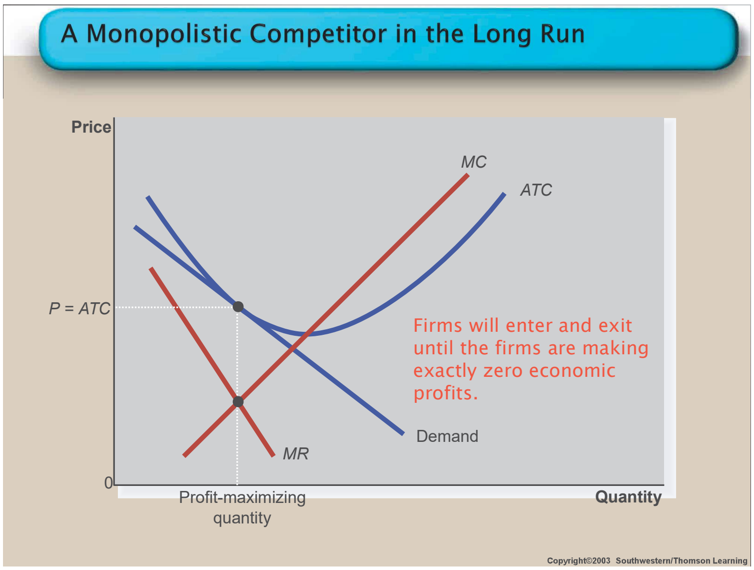
- The Monopolistically Competitive Firm in the Short Run
  - Short-run economic profits encourage new firms to *enter the market*.
  - This:
    - Increases the number of products offered.
    - Reduces demand faced by firms already in the market.
    - Incumbent firms' demand curves shift to the left.
    - Demand for the incumbent firms' products fall, and their profits decline.



Competition with differentiated products

- The Monopolistically Competitive Firm in the Short Run
  - Short-run economic losses encourage firms to *exit the market*.
  - This:
    - Decreases the number of products offered.
    - Increases demand faced by the remaining firms.
    - Shifts the remaining firms' demand curves to the right.
    - Increases the remaining firms' profits.





Long-Run Equilibrium

- Two Characteristics
  - As in a monopoly, price exceeds marginal cost (P>MC).
    - Profit maximization requires marginal revenue to equal marginal cost (MC=MR).
    - The downward-sloping demand curve makes marginal revenue less than price (MR < P).
  - As in a competitive market, price equals average total cost (P=ATC).
    - Free entry and exit drive economic profit to zero.

FILM: https://pl.khanacademy.org/economics-finance-domain/microeconomics/perfect-competition-topic/monopolistic-competition-oligop/v/monopolistic-competition-and-economic-profit

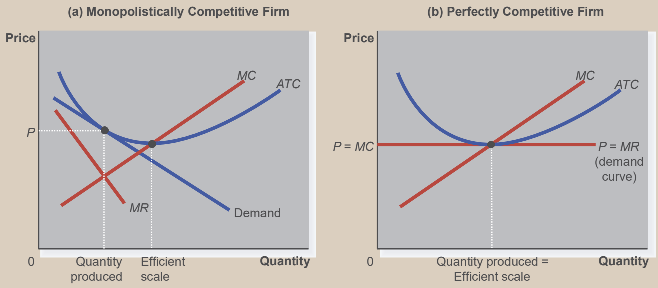
Monopolistic versus Perfect Competition

- There are two noteworthy differences between monopolistic and perfect competition:
  - excess capacity
  - markup.

Monopolistic versus Perfect Competition

- Excess Capacity
  - There is no excess capacity in perfect competition in the long run.
  - Free entry results in competitive firms producing at the point where average total cost is minimized, which is the efficient scale of the firm.
  - There is excess capacity in monopolistic competition in the long run.
  - In monopolistic competition, output is less than the efficient scale of perfect competition.

Figure 3 Monopolistic versus Perfect Competition

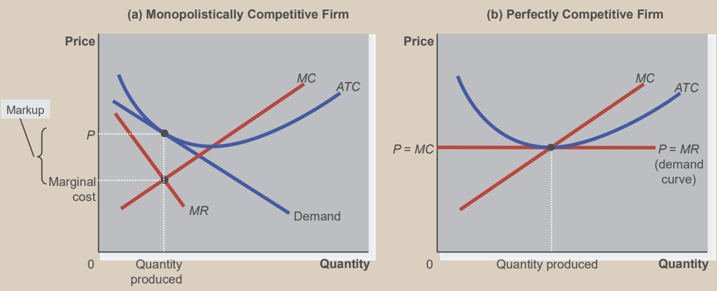


At the perfectly competitive market, firms produce at minimum ATC.
At the monopolistic competition, the production is below the efficient scale of production.

Monopolistic versus Perfect Competition

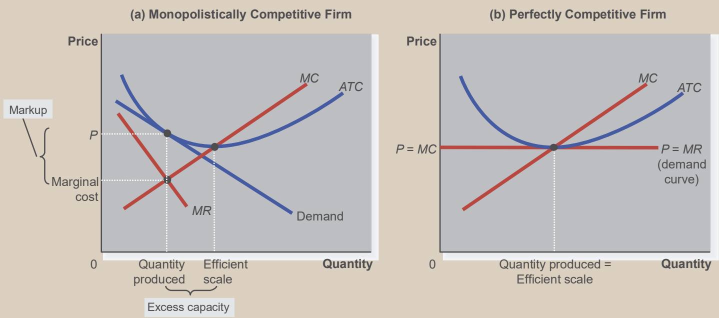
- Markup Over Marginal Cost
  - For a competitive firm, price equals marginal cost.
  - For a monopolistically competitive firm, price exceeds marginal cost.
  - Because price exceeds marginal cost, an extra unit sold at the posted price means more profit for the monopolistically competitive firm.

Figure 3 Monopolistic versus Perfect Competition



P = MC in the perfectly competitive market; P > MC in the market of monopolistic competition.
As P > MC, each sold unit of good increases the profits of the monopolistic firm.

Figure 3 Monopolistic versus Perfect Competition



Monopolistic Competition and the Welfare of Society

- There is the normal deadweight loss of monopoly pricing in monopolistic competition caused by the markup of price over marginal cost (P > MC).
- Another way in which monopolistic competition may be socially inefficient is that the number of firms in the market may not be the “ideal” one. There may be too much or too little entry.

Monopolistic Competition and the Welfare of Society

- The *product-variety externality*.
  - Because consumers get some consumer surplus from the introduction of a new product, entry of a new firm conveys a *positive externality* on consumers.
- The *business-stealing externality*.
  - Because other firms lose customers and profits from the entry of a new competitor, entry of a new firm imposes a *negative externality* on existing firms.

Advertising

- When firms sell differentiated products and charge prices above marginal cost, each firm has an incentive to advertise in order to attract more buyers to its particular product.
- Firms that sell highly differentiated consumer goods typically spend between 10 and 20 percent of revenue on advertising.
- Overall, about 2 percent of total revenue, or over $200 billion a year, is spent on advertising.

Brand Names

- Critics argue that brand names cause consumers to perceive differences that do not really exist.
- Economists have argued that brand names may be a useful way for consumers to ensure that the goods they are buying are of high quality.
  - providing information about quality.
  - giving firms incentive to maintain high quality.

Non-price competition

http://www.slideshare.net/tutor2u/oligopoly-the-kinked-demand-curve

Price discrimination

http://www.tutor2u.net/economics/reference/topical-examples-of-price-discrimination

Price discrimination

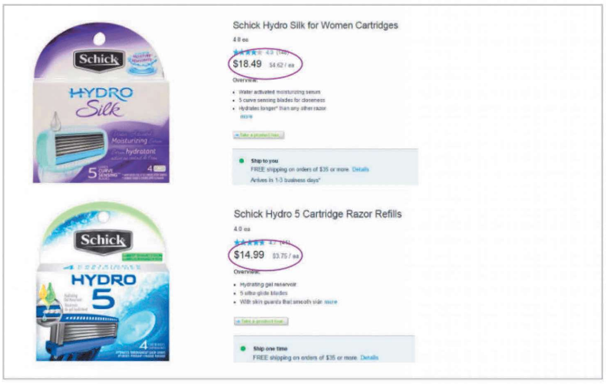
http://www.tutor2u.net/economics/blog/unit-3-micro-examples-of-price-discrimination-in-action

Examples

- Nurofen – australian court considered the firm guilty for selling the same pills under different brand names and with different prices (http://www.bbc.com/news/magazine-35091242)
- Gender price discrimination (women pay more, earn less)
  - The highest difference, even 48% regards goods like like shampoo, conditioner and gel
  - 11% in case of razor cartidges

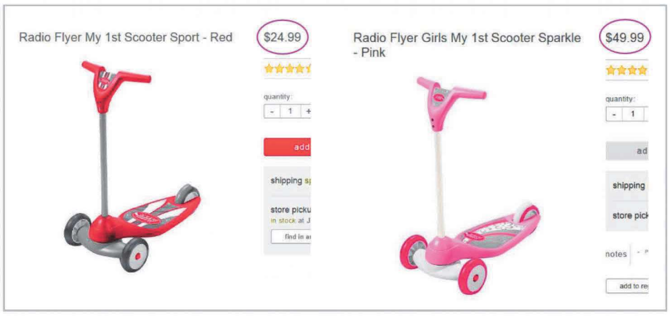
Source: Reuters

Razor cartiges



https://www.washingtonpost.com/news/wonk/wp/2015/12/22/women-really-do-pay-more-for-razors-and-almost-everything-else/?utm_term=.01ccd11e6363

Scooters for girls and boyes…



https://www.washingtonpost.com/news/wonk/wp/2015/12/22/women-really-do-pay-more-for-razors-and-almost-everything-else/?utm_term=.01ccd11e6363

Summary

- A monopolistically competitive market is characterized by three attributes: many firms, differentiated products, and free entry.
- The equilibrium in a monopolistically competitive market differs from perfect competition in that each firm has excess capacity and each firm charges a price above marginal cost.

Summary

- Monopolistic competition does not have all of the desirable properties of perfect competition.
- There is a standard deadweight loss of monopoly caused by the markup of price over marginal cost.
- The number of firms can be too large or too small.

FILM: https://pl.khanacademy.org/economics-finance-domain/microeconomics/perfect-competition-topic/monopolistic-competition-oligop/v/oligopolies-and-monopolisitc-competition

Imperfect competition

Monopolistic competition

- https://www.youtube.com/watch?v=T3F1Vt3IyNc

Oligopoly

- https://www.youtube.com/watch?v=ElBF2D7IHAI
- Collusion: https://www.youtube.com/watch?v=BYLe3ErmFFA