

Chapter 1

Economics:

- social science that studies choices that cope with scarcity and incentives that influence these choices.

Microecon:

- study of choices that individual business makes.

Factor of production:

- Land, capital, Labour, Entrepreneurship.
- human capital: the knowledge and skill that people obtain from edu.

Self interest:

- decision based on your personal thoughts.

Social interest:

- decision that makes everyone better off.

Globalization:

- expansion of international trade.

Appendix

Graph:

- x-axis: quantity
- y-axis: price

Patterns to look for in a graph:

- Variables move in same direction
- variable move in opposite direction
- variables have a max or min
- variables are unrelated

Positive relationship or direct relationship: (+slope)

- variables that move in same direction.

Linear relationship:

- relationship showed by a straight line.

Negative relationship or inverse relationship: (-slope)

- variables that move in opposite direction.

Unrelated variables:

- graph of x or y constant.

Ceteris Paribus:

- when there are more than two type of variables, you make relevant of two variables.

Chapter 2

Production Possibility Frontier (PPF):

- the boundary between combination of goods and service that can be provided.

Production efficiency:

- production efficiency is achieved when you cannot produce more good without producing less of some other good.
- all point on PPF are efficiency.

Opportunity cost:

- opportunity cost is a ratio
- how much it cost from a good the produce another good.

Marginal Cost: (MC)

- the opportunity cost to produce one or more unit of sth.

Marginal Benefit: (MB)

- benefit of consuming one or more unit of sth.
- principle of decreasing marginal benefit: the more we have sth, the less we are willing to pay.

Allocative Efficiency: (MC=MB)

- when we cannot produce anymore goods without giving out some other goods that we value more highly.

Comparative advantage:

- a person can perform an activity at a lower opportunity cost than anybody else.

Absolute advantage:

- if a person is more productive than others (make more)

Economic growth:

- increase in the standard of living.

Technological change:

- development of new goods or new ways of producing goods.

Firm:

- an economic unit that hires factors of production and organizes to make profit.

Market:

- any arrangement that enables buyers and sellers to get info and do business.

Property rights:

- social arrangements that govern ownerships, use, and disposal of resources, goods, or services.

Money:

- paper with number.

Positive Statement: statement of truth and facts.

Chapter 3

Competitive Market:

- a market with many buyers and sellers so no single buyer or seller can influence the price.

Money Price:

- the amount of money need to buy it.

Relative Price:

- the ratio of its money price to the money price of the next best alternative good — opportunity cost.

Quantity Demand:

- the amount that a costumer plan to buy.

Law of Demand:

- price high, **quantity** demand low. Price low, **quantity** demand high.

Substitution Affect:

- when the relative price (opp-cost) rises, people seeks substitute for it. So **quantity demand decreases**.

Income Effect:

- when the price of a good or service rises to income, people cannot afford all the things they previously bought., so the **quantity demanded** of the good or services **decreases**.

Demand:

- relationship between quantity demand of a good and its price.

Demand curve:

- shows the relationship between the quantity demanded of a good and its price.
- When demand increases, the demand curve shifts rightward.
- When demand decreases, the demand curve shifts leftward.

Substitute:

- a good that can be in use of other goods. => price of substitute increase => **demand increase**

Complement:

- goods that are used with other goods.
=> price of complement falls => **demand increases**

Expected future Price:

- if the price of a good is expected to rise in the future, than the **demand increases** and shift right.

Income:

- when income increases the **demand increases** and shift rightwards.
- a demand of **Normal Goods** increases when **income increases**.
- a demand of **Inferior Goods** decreases when **income increases**.

Expected future Income and Credit:

- when income is expected to increase in the future, credit can be obtained easily, and **demand may increase now.**

Population:

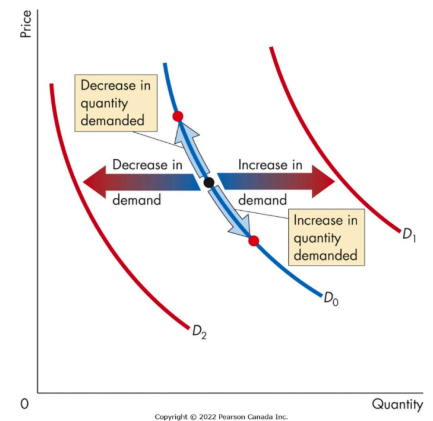
- the greater the population the greater the demand of all goods.

Preferences:

- People with the same income have different demands if they have different preferences.

Change of Demand v.s. Change in quantity demanded:

- Move along demand curve: price change and other remain the same
- Shift of Demand curve: price same and other influence buyer's plan



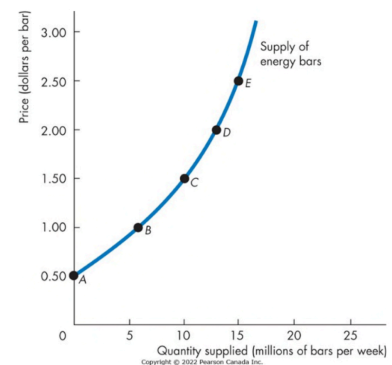
Supply:

Law of Supply:

- Other things remain the same, the higher the price of a good, the greater is the quantity supplied. The lower the price, the smaller the quantity supplied.

Minimum Supply price:

- As the quantity produced increases, marginal cost increases.
- The lowest price at which someone is willing to sell an additional unit rises.
- The lowest price is the marginal cost.



Factors that change the supply of a good:

- Price of factors production: if price of a factor of production rise, the minimum price that a supplier is willing to accept for producing each good rises.
=> rise in the price of a factor of production => **decreases supply.**
- Price of related goods Produced:
=> **Supply of a good increase** if a substitute in production falls.
=> **Supply of a good increase** if the price of a complement in production rises.
- Expected Future prices: If price expected to rise in future, **supply today decreases.**
- Large number of Suppliers: The larger number of suppliers of a good, the greater is the supply of a good.
=> an increase in the number of suppliers shift **supply curve to the right.**
- Technology: advance in technology create new products and lower the cost of producing existing products.
=> advanced technology **increases supply**

- The State of Nature: A natural disaster **decreases supply**.

Change of supply **v.s.** Change in quantity supply :

Move along supply curve: price changes and other remains the same.

Shift of supply curve: price remain same other influence sellers' plan.

Market Equilibrium:

Equilibrium Price:

- quantity demand = quantity supply
- quantity bought at the equilibrium price

Predicting Changes in Price and Quantity:

Chapter 4:

Price elasticity of demand:

- a units-free measure of the responsiveness of the quantity demanded of a good.

$$\frac{\text{Percentage change in the quantity demanded}}{\text{Percentage change in the price}} \quad \mathbf{x/y}$$

$$\Delta Q/Q_{ave} \times 100 / \Delta P/P_{ave} \times 100,$$

Perfectly inelastic demand:	elasticity = 0. (vertical)
Unit elastic demand:	elasticity = 1.
Inelastic demand:	elasticity < 1.
Elastic demand:	elasticity > 1.
Perfectly elastic demand:	elasticity = ∞ (horizontal)

Factors that influence elasticity of demand:

- Closeness of the substitute: the closer the substitute, the more elastic.
Necessities => inelastic Luxuries => elastic
- Proportion of Income Spent on the Good: The greater the proportion of income consumers spend on a good, the larger is the elasticity.
- Time Elapsed Since Price Change: The more time consumers have to adjust to a price change, or the longer that a good can be stored without losing its value, the more elastic.

Demand curve / elasticity:

- prices above the midpoint => elastic
- prices below the midpoint => inelastic
- mid-point => unit elastic

Total Revenue test:

- Total Revenue = price x quantity sold (or quantity demand).
- If demand elastic => a 1 percent price cut increases the quantity sold by more than 1 percent, and total revenue increases.
- If demand inelastic => a 1 percent price cut increases the quantity sold by less than 1 percent, and total revenues decrease.
- If demand unit elastic => a 1 percent price cut increases the quantity sold by 1 percent, and total revenue unchanged.

5. Total Revenue Test

Inelastic Demand

Price ↑, TR ↑

Price ↓, TR ↓

Elastic Demand

Price ↑, TR ↓

Price ↓, TR ↑

Income Elasticity of demand:

- measures how the quantity demanded of a good responds to a change in income.

$$\frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

- Income elasticity greater than 1 => elastic and normal good
- Income elasticity greater than 0 => inelastic and normal good
- Income elasticity less than 0 => inferior good

Cross Elasticity of demand:

- measure of the responsiveness of demand for a good to a change in the price of a substitute or a complement.

$$\frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price of substitute or complement}}$$

- The cross elasticity of demand between goods that are
 - substitutes is **positive**
 - complements is **negative**.

Elasticity of Supply:

- measures the responsiveness of the quantity supplied to a change in the price of a good.

$$\frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

- perfectly inelastic => 0 (vertical line)
 - unit elastic => linear and passes through origin
 - perfectly elastic => ∞ (horizontal)
-
- easier it is to substitute among the resources => the greater elasticity supply
 - more time that passes after a price change => greater is the elasticity supply

Price Elasticities of Demand A relationship is described as	When its magnitude is	Which means that
Perfectly elastic	Infinity	The smallest possible increase in price causes an infinitely large decrease in the quantity demanded*
Elastic	Less than infinity but greater than 1	The percentage decrease in the quantity demanded exceeds the percentage increase in price
Unit elastic	1	The percentage decrease in the quantity demanded equals the percentage increase in price
Inelastic	Less than 1 but greater than zero	The percentage decrease in the quantity demanded is less than the percentage increase in price
Perfectly inelastic	Zero	The quantity demanded is the same at all prices

Income Elasticities of Demand A relationship is described as	When its value is	Which means that
Income elastic (normal good)	Greater than 1	The percentage increase in the quantity demanded is greater than the percentage increase in income*
Income inelastic (normal good)	Less than 1 but greater than zero	The percentage increase in the quantity demanded is greater than zero but less than the percentage increase in income
Negative (inferior good)	Less than zero	When income increases, quantity demanded decreases

Cross Elasticities of Demand A relationship is described as	When its value is	Which means that
Close substitutes	Large	The smallest possible increase in the price of one good causes an infinitely large increase in the quantity demanded* of the other good
Substitutes	Positive	If the price of one good increases, the quantity demanded of the other good also increases
Unrelated goods	Zero	If the price of one good increases, the quantity demanded of the other good remains the same
Complements	Negative	If the price of one good increases, the quantity demanded of the other good decreases

Elasticities of Supply A relationship is described as	When its magnitude is	Which means that
Perfectly elastic	Infinity	The smallest possible increase in price causes an infinitely large increase in the quantity supplied*
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Inelastic	Greater than zero but less than 1	The percentage increase in the quantity supplied is less than the percentage increase in the price
Perfectly inelastic	Zero	The quantity supplied is the same at all prices

*In each description, the directions of change may be reversed. For example, in the perfectly elastic demand case, the smallest possible *decrease* in price causes an infinitely large *increase* in the quantity demanded.

Chapter 8:

Utility-Maximizing Choice:

- Find Just-Affordable Combinations
- Find the Total Utility for Each Just-Affordable Combination
- Consumer Equilibrium: allocated all income to maximize total utility.

marginal utility per dollar:

- marginal utility from a good divided by its price

Utility-Maximizing Rule: Equalize the marginal utility per dollar for all good.

1. What is the utility maximizing rule?

$$\frac{\text{Marginal Utility A}}{\text{Price of A}} = \frac{\text{Marginal Utility B}}{\text{Price of B}}$$

Chapter 9:

Budget line:

- describes the limits to the household's consumption choices
- states that expenditure = income
- Relative price is the magnitude of the slope of the budget line.

$$P_C Q_C + P_M Q_M = Y.$$

indifference curve:

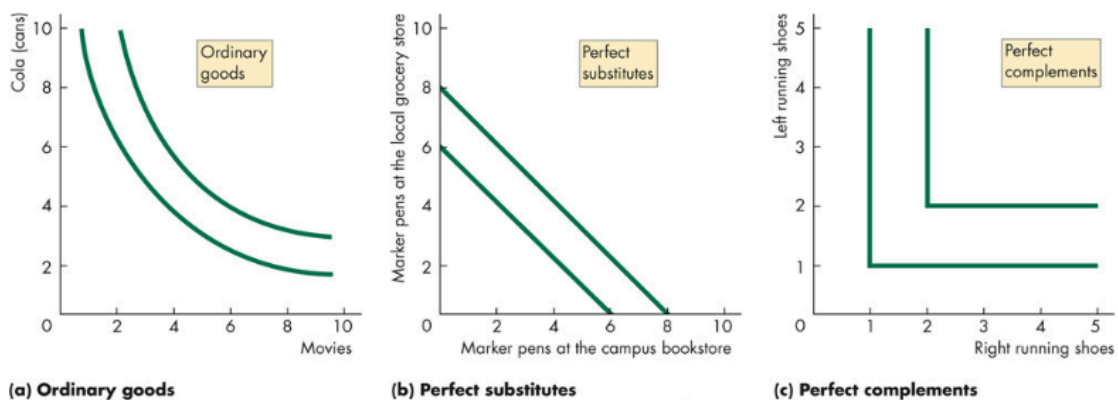
- a line that shows combinations of goods among which a consumer is indifferent.
- all points on the indifference curve have the same utility
- points above the curve > points on the curve > points below the curve

Marginal Rate of Substitution: (MRS)

- the rate at which a person is willing to give up good y to get an additional unit of good x while at the same indifference curve.
- marginal rate of substitution = the slope of the indifference curve
- MRS high → willing to give up large to obtain another
- MRS low → willing to give up small to obtain another

Preferences and Indifference Curves:

- Indifference curve describe the degree of substitutability

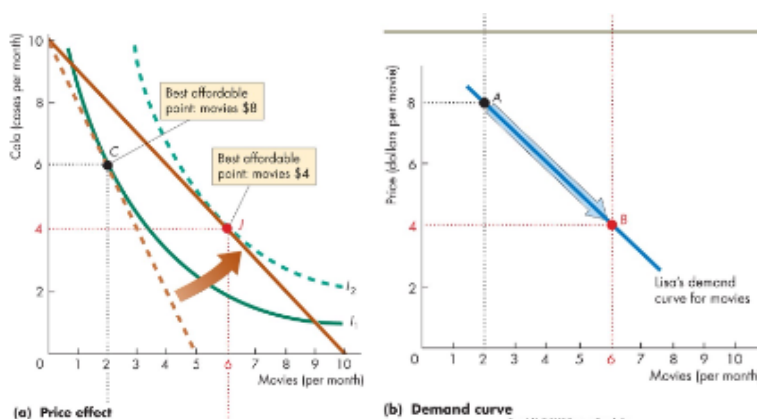


Best affordable choice:

- on budget line
- highest attainable MRS
- MRS(slope of I curve) = relative price of two goods (P_a / P_b)

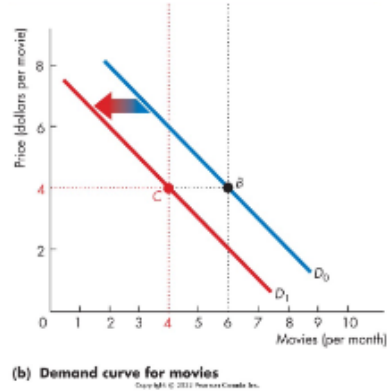
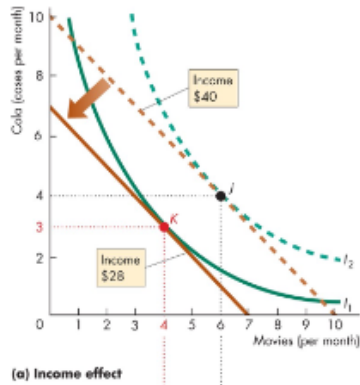
Price Effect:

- the effect change in price have on quantity consumed
- illustrates how demand curve is formed
- the following graph price of movie falls from 8 to 4 → **forms** demand curve



Income effect:

- the effect change in income have on the quantity consumed
- illustrates how demand curve shifts
- in the following graph the income(budget) falls



Substitution effect:

- the effect change in price have on the quantity consumed (on the same indifference curve)
- basically price effect but on the same I curve.

Chapter 10:

Accounting Profit:

- Profit = total revenue - total cost

Economic profit:

- Profit = total revenue - opportunity cost of production

Firm's opportunity cost of production

- Resources Bought in the Market
- Resources Owned by the Firm, i.e. capital
firm's opportunity of using the capital it owns is called implicit rental rate
Implicit rental rate: Economic depreciation (change in market value) and Interest forgone
- Resources Supplied by the Firm's Owner
Normal profit: profit that an entrepreneur can expect to receive on average

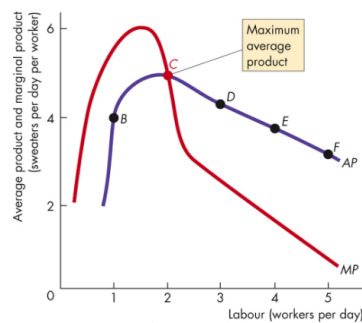
sunk cost: is a cost incurred by the firm and cannot be changed

Short-Run Technology Constraint:

- increase output in the short run → increase the amount of labor employed
- Product Schedules: relationship between output and labor employed

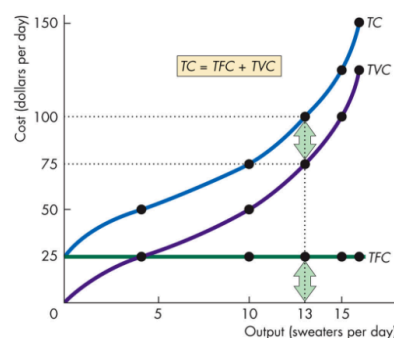
Total product: total output produced in a given period

- marginal product: change in product that results from 1 increase employee
- average product: total product divided / quantity of labor employed
- total product is maximized when $MP = AP$



Total Cost:

- total cost (TC): cost of all resources used.
- total fixed cost (TFC): cost of firm's fixed inputs (does not change with outputs)
- total variable cost (TVC): the cost of firm's variable inputs. (does change with output)
- $TC = TFC + TVC$

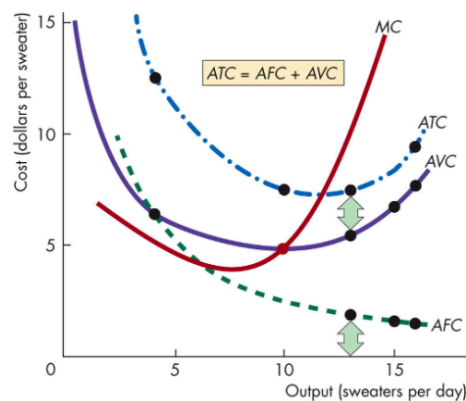


Marginal Cost:

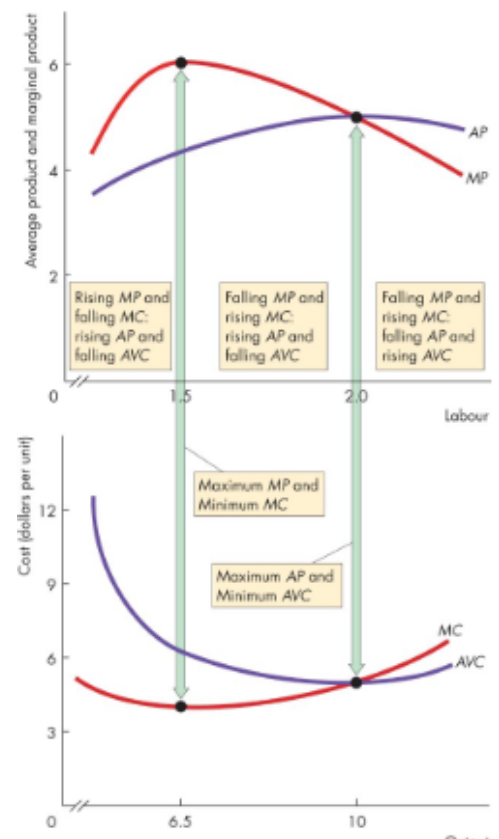
- the increase in total cost that results from a one-unit increase in total product

Average Cost:

- Average fixed cost (AFC): total fixed cost per unit output
- Average variable cost (AVC): total variable cost per unit of output
- Average total cost (ATC): total cost per unit of output
- $ATC = AFC + AVC$



- MC minimum \rightarrow MP maximum
- MP rising \rightarrow MC falling
- AP rising \rightarrow AVC falling



Shifts in the cost curves: (depend on 2 factors)

- Technology: increase in productivity shifts the product curves upwards
- Prices of Factors of Production:
 - FC increase \rightarrow ATC upwards, does not shift MC
 - VC increase \rightarrow AVC, TC, and MC upwards

Long-Run Cost:

- all inputs and all costs are variable

production function:

- the relationship between the maximum output attainable and the quantities of both capital and labor

Economies of scale:

- a firm's technology that lead to **falling** long-run average cost as output increases

Diseconomies of scale:

- a firm's technology that lead to **rising** long-run average cost as output increases

Constant returns to scale:

- a firm's technology that lead to **constant** long-run average cost as output increases

Minimum Efficient Scale:

- smallest quantity of output at which the long-run average cost reaches its minimum

Chapter 11: perfect competition

Perfect competition:

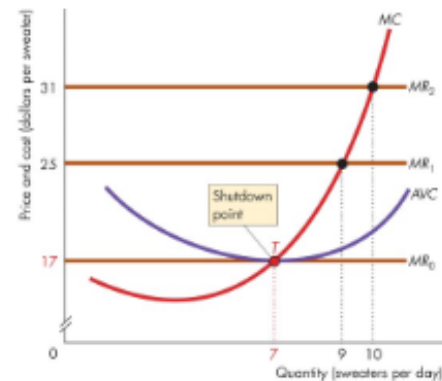
- firms sell identical products
- no restrictions to entry
- Established firms have no advantages over new ones
- firm is a **price taker**
- total revenue = $P \times Q$
- demand is perfectly elastic
- $MR = MC$ maximize

Loss Comparisons:

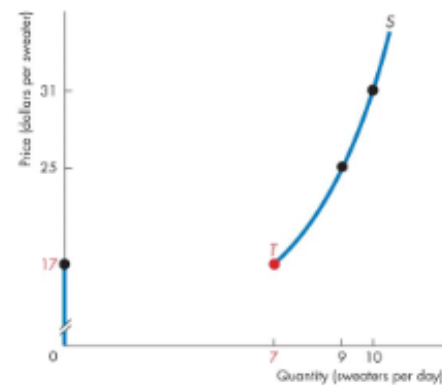
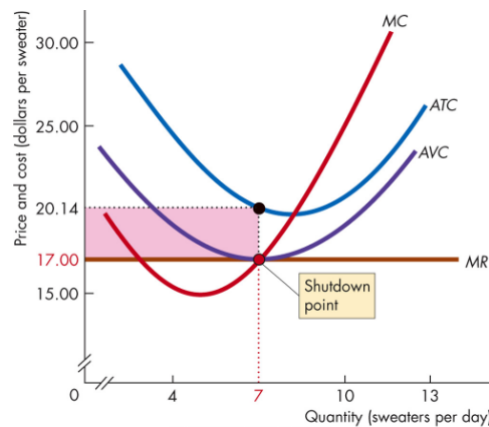
- $\text{loss} = TFC + TVC - TR = TFC + (AVC - P) \times Q$
- If firm shuts down, $Q = 0$ and still have to pay TFC (loss = TFC)

The Shutdown Point:

- **shutdown point is minimum AVC**
- experiences loss = TFC
- supply curve linked to its marginal cost curve (shows how supply curve form)

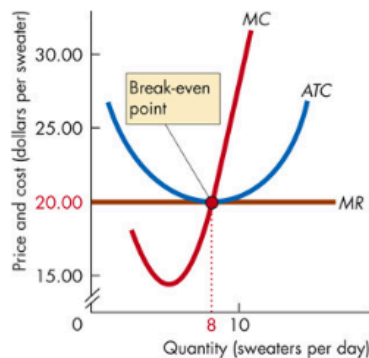


(a) Marginal cost and average variable cost

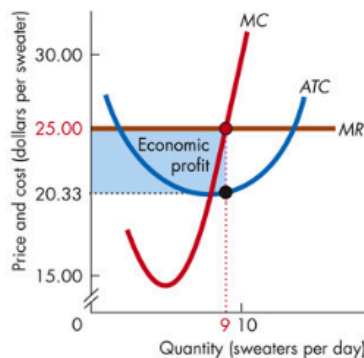


(b) Campus Sweaters' short-run supply curve

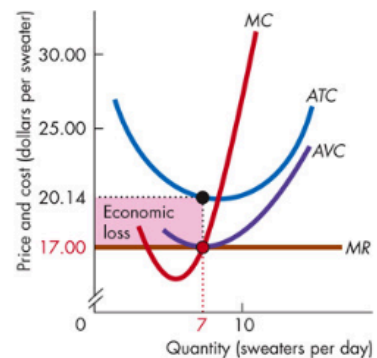
Short run equilibrium:



(a) Break even



(b) Economic profit

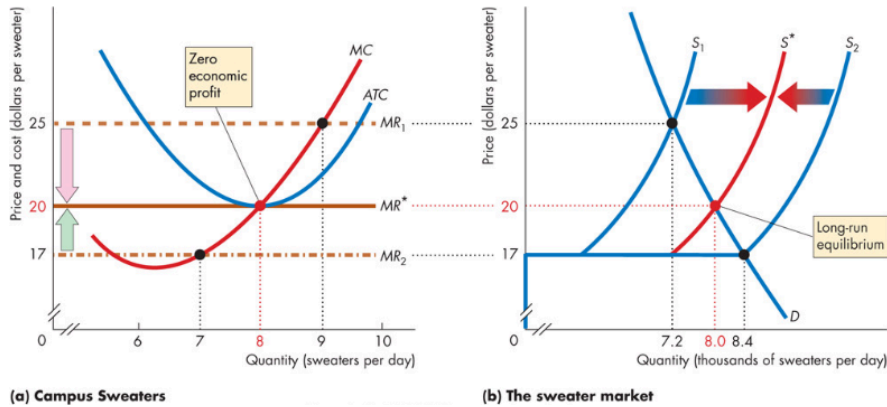


(c) Economic loss

Entry and Exit:

- when there is profit, and firms enter, supply increases and supply falls
- In the long run, the market price falls until firms are making zero economic profit.

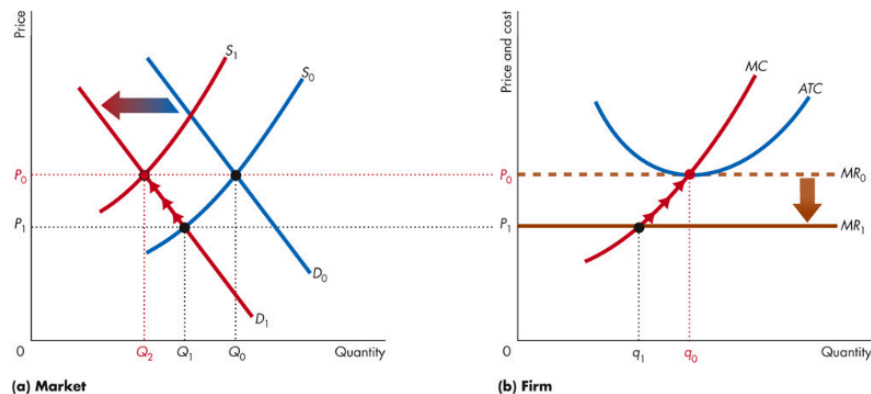
(pic): when loss happens and firms exit, market supply and the market price rises



Changes in Demand and Supply:

- increase in demand → price and quantity increases → long-run equilibrium profits
- increase in demand → runs the cycle → change the number of firms in the market

(pic): A decrease in demand:



- when technology lowers cost, ATC and MC shifts downward

Efficient Use of Resources:

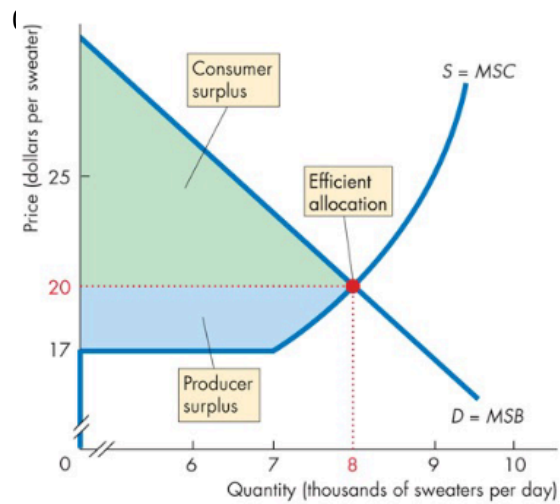
- marginal social benefit = marginal social cost

Choices:

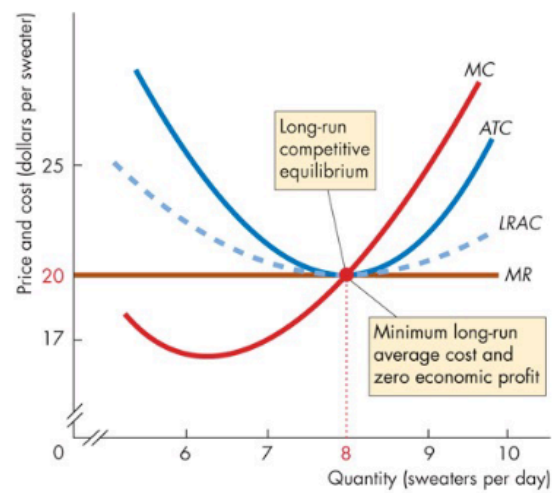
- all points along their **demand curves**, **consumer** get the most value
- all points along their **supply curves**, **firms** get the most value

Equilibrium and Efficiency:

- $qD = qS \rightarrow$ marginal social benefit = when marginal social cost
- $D = MSB \rightarrow$ consumers are efficient
- $S = MSC \rightarrow$ producers are efficient

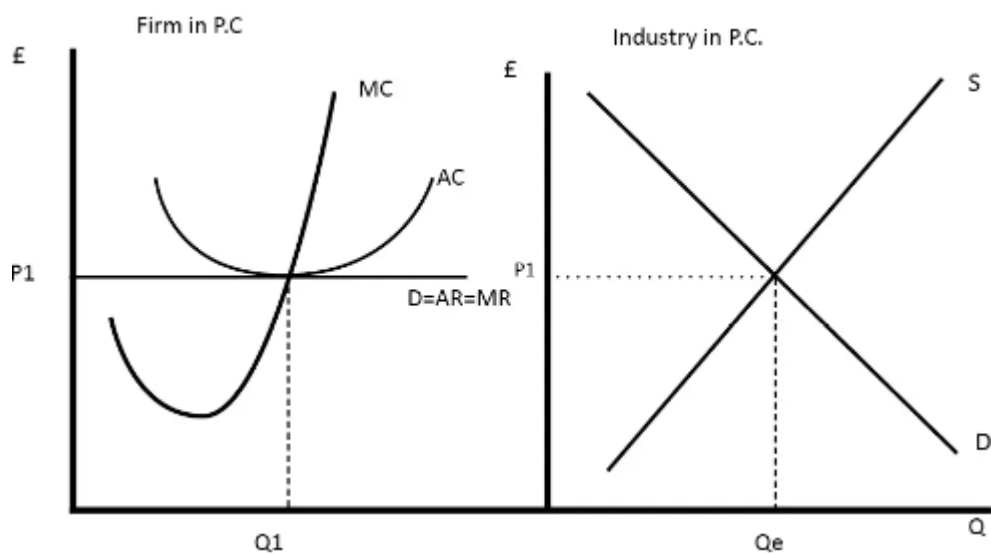


(a) The sweater market



(b) Campus Sweaters

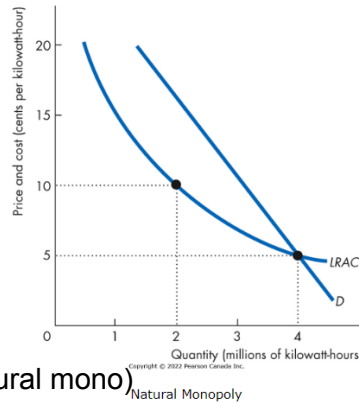
$S = MC$



Chapter 12: Monopoly

Monopoly:

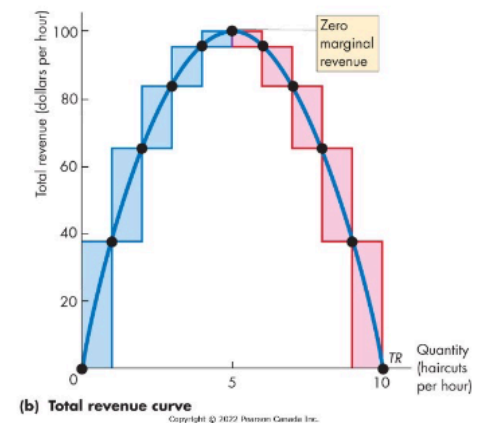
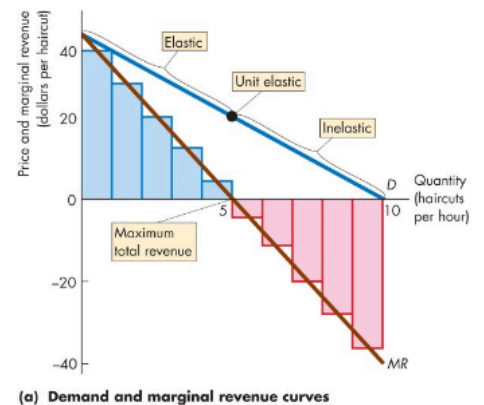
- No close substitute
- Barriers to entry
- a price setter
- to sell more → lower price
- $MR < P$ (single price)



- Natural Barriers to Entry (Natural mono)
- Ownership Barriers to Entry
- Legal Barriers to Entry (legal mono)

Monopoly Price-Setting Strategies:

- single-price monopoly → price same to all customers
- price discrimination → selling different units of goods with different price
- Total **revenue is maximized** when $MR = 0$
- **profit maximize** → $MR = MC$
- In Monopoly, Demand Is Always Elastic



Single-Price Monopoly v.s. perfect Competition

Perfect Competition:

- equilibrium → $S = D$
- $D = MSB$ and $S = MSC$ → efficient: $MSB = MSC$

Monopoly:

- equilibrium output → $MR = MC$
- Equilibrium price → on demand curve
- smaller output, higher price

Price Discrimination:

- selling goods at different price
- Increasing Profit and Producer Surplus

Two Ways of Price Discriminating:

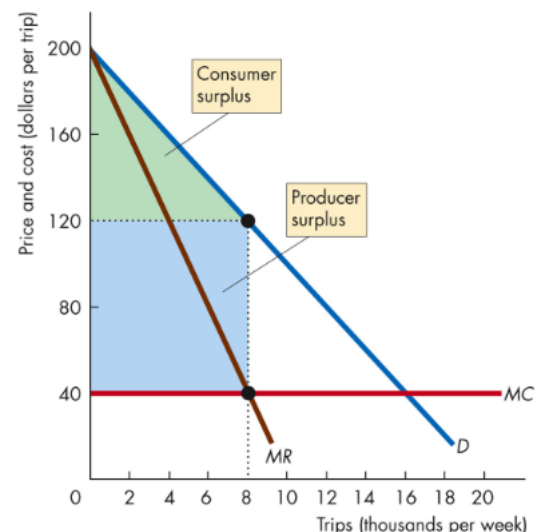
- Among groups of buyers. ex: airline tickets
- Among units of a good. ex: quantity discounts

Perfect Price Discrimination:

- a firm is able to sell each unit at the highest price
- **$MR = D$**

Producer surplus = $TR - \text{area under } MC$

Marginal Revenue and Elasticity



Regulation:

- Social interest theory
- Capture theory (idk wtf r these)

Regulation of natural monopoly:

Marginal cost pricing rule:

- regulation that sets price of natural monopoly to $MC = D$ (or $MSB = MSC$)

average cost pricing rule: (second best)

- set the $P = AC$

Monopoly regulation:

- rate of return regulation
- price cap regulation $P = AC$

Chapter 13:

Monopolistic competition:

- large number of firms compete
- each firm produces differentiated product
- firms compete in price, quality, marketing
- firms free to enter and leave (**no profit in the long run**)

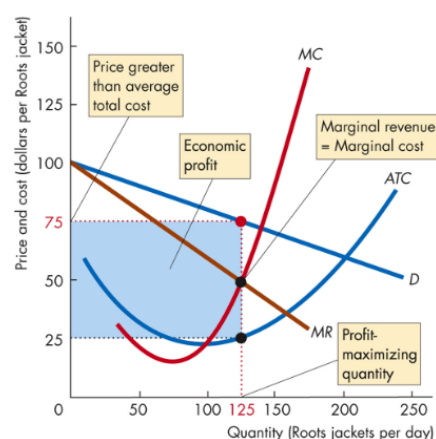
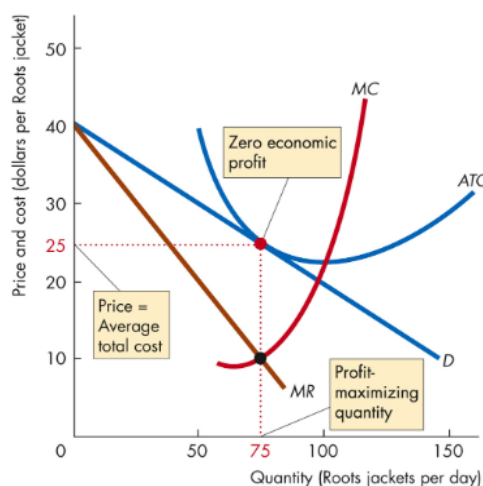
Measures of Concentration:

- **four-firm concentration ratio** (percentage of the total revenue of the four largest firm)
(0 for Perfect com, <60 and > 60 for competitive and concentrate market, 100 mono)
- **Herfindahl-Hirschman Index** (square of the percentage owned summed over top 50 firm)
(monopolistic competition between 1500 to 2500)

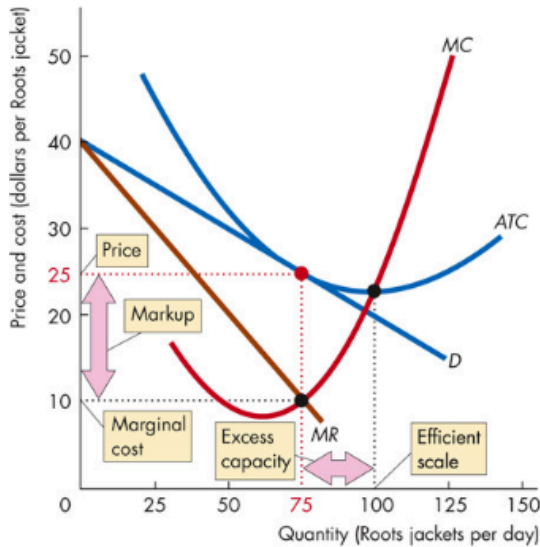
Characteristics	Perfect competition	Monopolistic competition	Oligopoly	Monopoly
Number of firms in industry	Many	Many	Few	One
Product	Identical	Differentiated	Either identical or differentiated	No close substitutes
Barriers to entry	None	None	Moderate	High
Firm's control over price	None	Some	Considerable	Considerable or regulated
Concentration ratio	0	Low	High	100
HHI (approx. ranges)	Close to 0	Less than 2,500	More than 2,500	10,000
Examples	Wheat, honey	Pizza, clothing	Airplanes	Cable TV

Price and output: (short run)

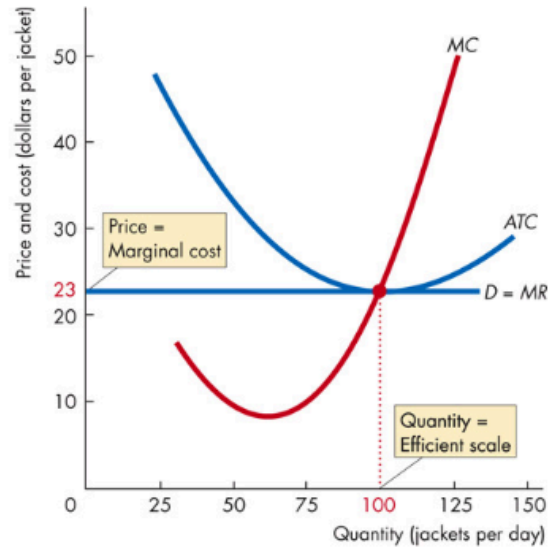
- profit maximizing quantity **MR = MC**
(or loss minimizing)
- operates like a **single price monopoly**
- makes profit when $P > ATC$
- long run, induces entry
- as new firm enters, price falls until $P = ATC$
- following pic is long run equilibrium



No profit in the long run



(a) Monopolistic competition



(b) Perfect competition

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Excess Capacity and Markup

Efficiency:

- $P = MSB$ and $MC = MSB$

Product development:

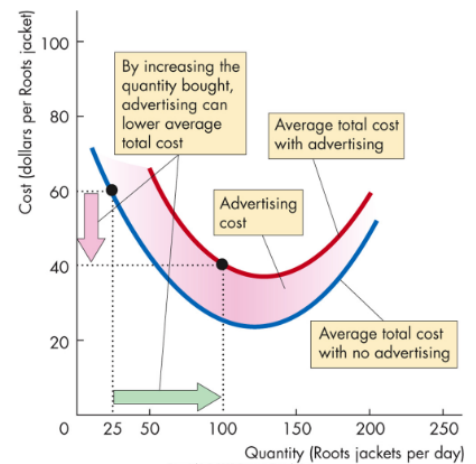
- To make profit, firms have to continue to make product development.

Advertising:

- advertising increases cost and demand → →
- makes the demand more elastic

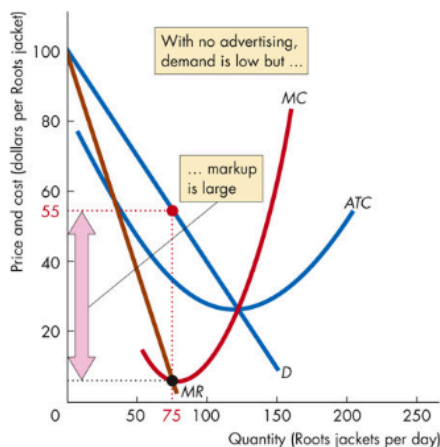
Selling Costs and Total Costs:

- AFC decreases as output increases

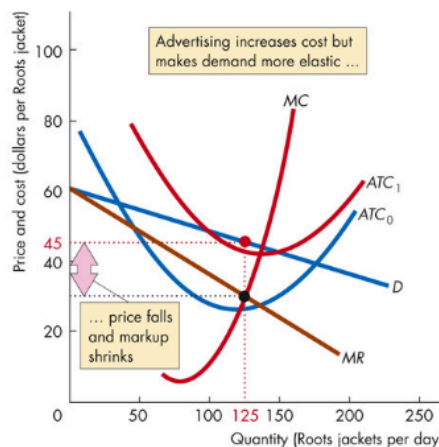


Selling Costs and Total Cost

advertising before and after:



(a) No firms advertise



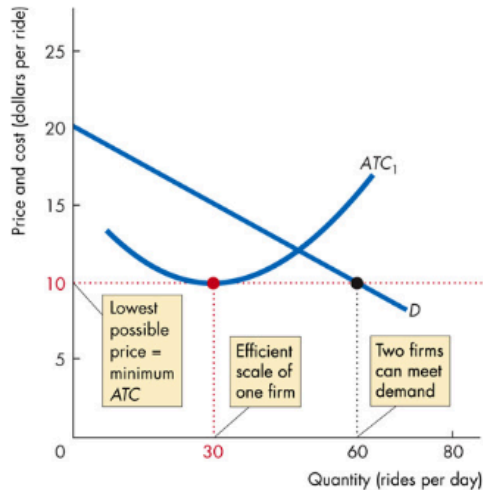
(b) All firms advertise

Oligopoly:

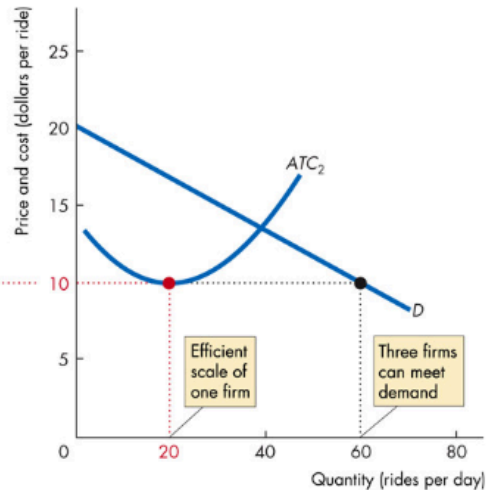
- Natural or legal barriers prevent the entry of new firms
- small number of firms

Barriers to Entry:

- natural or legal barriers
- duopoly: a market with two firms



(a) Natural duopoly



(b) Natural oligopoly with three firms

Interdependence:

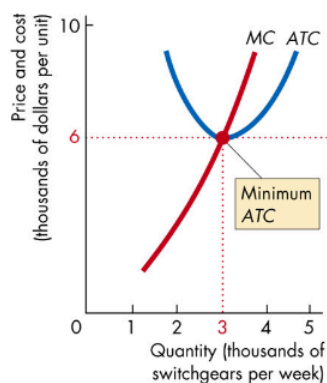
- each firm's profit depends on every firm's action

Temptation to Cooperate:

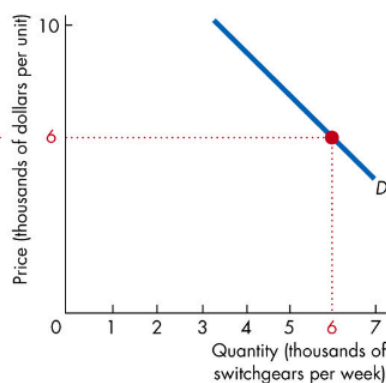
- temptation to form a cartel (illegal)

Game theory:

- payoff matrix: Nash equilibrium



(a) Individual firm



(b) Industry

Art's strategies		Confess	Deny
Confess	Bob's strategies	3 years / 3 years	10 years / 1 year
		1 year / 10 years	2 years / 2 years
Deny			

collusive agreement:

- agreement between two firms to restrict output, raise the price, and increase profits.

punishment strategies:

- tit-for-tat strategy: one player cooperates this period if the other player cooperated in the previous period
- trigger strategy: a player cooperates if the other player cooperates but plays the Nash equilibrium strategy forever if someone cheats.

Games and Price Wars:

- Price wars might result from a tit-for-tat strategy where there is an additional complication – uncertainty about changes in demand.

contestable market:

- a market in which firms can enter and leave so easily that firms in the market face competition from potential entrants.

