

Principles of Economics

Gaurav KS

August 1, 2022

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 - Who cooks dinner?
 - Who does the laundry?
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 - Who gets to choose what TV show to watch?
- In short, the **household must allocate its scarce resources among its various members**, taking into account each member's abilities, efforts, and desires.

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 - who will eat paneer and who will eat potatoes.
 - it must decide who will drive a Ferrari and who will take the bus.

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Economics is the study of how society manages its scarce resources.

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 - the fraction of the **population that cannot find work**, and
 - the **rate at which prices are rising**.

Why we are studying Economics?

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- Apply principles of economics to understand/assess an Economic Policy.

Types of Economic policy

- Fiscal Policy

Types of Economic policy

- Fiscal Policy
- Monetary Policy

Session Summary

THANK YOU

Principles of Economics

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August 3, 2022

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What we discussed in previous lecture!

Recap-1

- Economics: study of scarcity and its implications

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- Economy ← Greek word **oikonomos**; which means *“one who manages a household”*

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- Economy ← Greek word **oikonomos**; which means “*one who manages a household*”
- A *household* faces many decisions - **allocate its scarce resources** among its various members

Recap-2

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- Society faces many decisions
- **Allocation** - what jobs will be done and who will do them
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- **Fairness** - efficiency versus equality because ... **RESOURCES ARE SCARCE**

Recap-3

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Recap-5

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Recap-6: Some terminologies

- Gross Domestic Product (GDP): **total value of all goods and services**
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- Gross Domestic Product (GDP): total value of all **goods** and **services** (produced in a country in one year)

In your terminology/intuition: You may try connecting it as **HARDWARE** and **SOFTWARE**.

Recap-6: Some terminologies

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- Inflation: a **general rise in prices**; the rate at which prices rise

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- Gross Domestic Product (GDP): total value of all **goods** and **services** (produced in a country in one year)
- Inflation: a **general rise in prices**; the rate at which prices rise
- Unemployment: the situation of **not being able to find a job**

- Two types of Economic policy

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- Fiscal - Economic Policy from Government

Recap-7

- Two types of Economic policy
- **Fiscal** - Economic Policy from Government
- **Monetary** - Economic Policy from Central Bank (RBI)

What we are going to discuss today ...

“Ten Principles of Economics”

Ten Principles of Economics: Under three themes

- HOW PEOPLE/INDIVIDUAL MAKE DECISIONS

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- HOW PEOPLE/INDIVIDUAL MAKE DECISIONS
- HOW PEOPLE/INDIVIDUAL INTERACT

Ten Principles of Economics: Under three themes

- HOW PEOPLE/INDIVIDUAL MAKE DECISIONS
- HOW PEOPLE/INDIVIDUAL INTERACT
- HOW THE ECONOMY AS A WHOLE WORKS

HOW PEOPLE/INDIVIDUAL MAKE DECISIONS

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Principle 1: **People face trade-offs**

HOW PEOPLE/INDIVIDUAL MAKE DECISIONS

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- “There ain’t no such thing as a *free lunch.*”

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- “There ain’t no such thing as a *free lunch.*”
- Making decisions require trading off one goal against another.

HOW PEOPLE/INDIVIDUAL MAKE DECISIONS

Principle 1: People face trade-offs

- “There ain’t no such thing as a *free lunch.*”
- Making decisions require trading off one goal against another.
- Essentially, making decisions requires comparing the costs and benefits of alternative courses of action.

Principle 1: People face trade-offs

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Principle 1: **People face trade-offs**

- Making decisions require trading off one goal against another.
- As a student, choice between taking a job or pursuing a higher degree.

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- Making decisions require trading off one goal against another.
- As a student, choice between taking a job or pursuing a higher degree.
- As a family, choice between allocation of the family income.

Principle 1: People face trade-offs

- Making decisions require trading off one goal against another.

Principle 1: **People face trade-offs**

- Making decisions require trading off one goal against another.
- Government's decision of trading off between defense, infrastructure and other resources.

Principle 1: **People face trade-offs**

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- EFFICIENCY AND EQUALITY:

Principle 1: **People face trade-offs**

- EFFICIENCY AND EQUALITY:
- Getting maximum benefit from society's resources is efficiency while, distributing those resources uniformly is equality.

HOW PEOPLE/INDIVIDUAL MAKE DECISIONS

Principle 2: **The Cost of something is what you give up to get it**

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- The cost of sacrificing the second best alternatives → '**Opportunity Cost**'
- For example, when you choose to pursue an MBA in place of a job, your job package is the opportunity cost.

Principle 3: **Rational people always think at margin**

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- Economists normally assume that people are “**rational**”.

Principle 3: **Rational people always think at margin**

- Economists normally assume that people are “**rational**”.
- Rational people systematically and purposefully do the best they can to achieve their objectives, given the available opportunities.

HOW PEOPLE/INDIVIDUAL MAKE DECISIONS

3: Rational people always think at margin

- Economists use the term marginal changes to describe small incremental adjustments to an existing plan of action.

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HOW PEOPLE/INDIVIDUAL MAKE DECISIONS

3: Rational people always think at margin

- Keep in mind that margin means “edge”, so marginal changes are adjustments around the edges of what you are doing.
- Rational people often make decisions by comparing marginal benefits and marginal costs.

Principle 4: People Respond to Incentives

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- Rewards or Punishments

Principle 5: Trade can make everyone better off

Session Summary

Principles of Economics

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August 4, 2022

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What we discussed in previous lecture!

Recap-1: Ten Principle of Economics

Recap-1: Ten Principle of Economics

- HOW PEOPLE/INDIVIDUAL MAKE DECISIONS: [1-4]

Recap-1: Ten Principle of Economics

- HOW PEOPLE/INDIVIDUAL MAKE DECISIONS: [1-4]
- HOW PEOPLE/INDIVIDUAL INTERACT: [5-7]

Recap-1: Ten Principle of Economics

- HOW PEOPLE/INDIVIDUAL MAKE DECISIONS: [1-4]
- HOW PEOPLE/INDIVIDUAL INTERACT: [5-7]
- HOW THE ECONOMY AS A WHOLE WORKS: [8-10]

Recap-2: HOW PEOPLE MAKE DECISIONS

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- ① People face trade-offs

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- ② The Cost of something is what you give up to get it

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Recap-2: HOW PEOPLE MAKE DECISIONS

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- ③ Rational people always think at margin
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Recap-3: HOW PEOPLE/INDIVIDUAL INTERACT

[5] Trade can make everyone better off

What we are going to discuss today ...

Principle 6: Markets are usually a good way to organize economic activity

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- Adam's notion of “Invisible Hand”

Principle 7: **Government can sometimes improve market outcomes**

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- Market failures occur when the market fails to allocate resources efficiently.

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- Market failures occur when the market fails to allocate resources efficiently.
- Governments can step in and intervene in order to promote efficiency and equity.

Principle 8: A country's standard of living depends on its ability to produce goods and services.

HOW THE ECONOMY AS A WHOLE WORKS

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- The more goods and services produced in a country, the higher the standard of living.

HOW THE ECONOMY AS A WHOLE WORKS

Principle 8: **A country's standard of living depends on its ability to produce goods and services.**

- The more goods and services produced in a country, the higher the standard of living.
- As people consume a larger quantity of goods and services, their standard of living will increase.

Principle 9: Prices rise when government prints too much money.

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- When too much money is floating in the economy, there will be higher demand for goods and services.
- This will cause firms to increase their price in the long run causing inflation.

Principle 10: Society faces a short run trade-off between inflation and unemployment.

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- In the short run, when prices increase, suppliers will want to increase their production of goods and services.

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- In the short run, when prices increase, suppliers will want to increase their production of goods and services.
- In order to achieve this, they need to hire more workers to produce those goods and services.

Three Basic Questions of Economics

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- What to Produce? → **Allocation**

Three Basic Questions of Economics

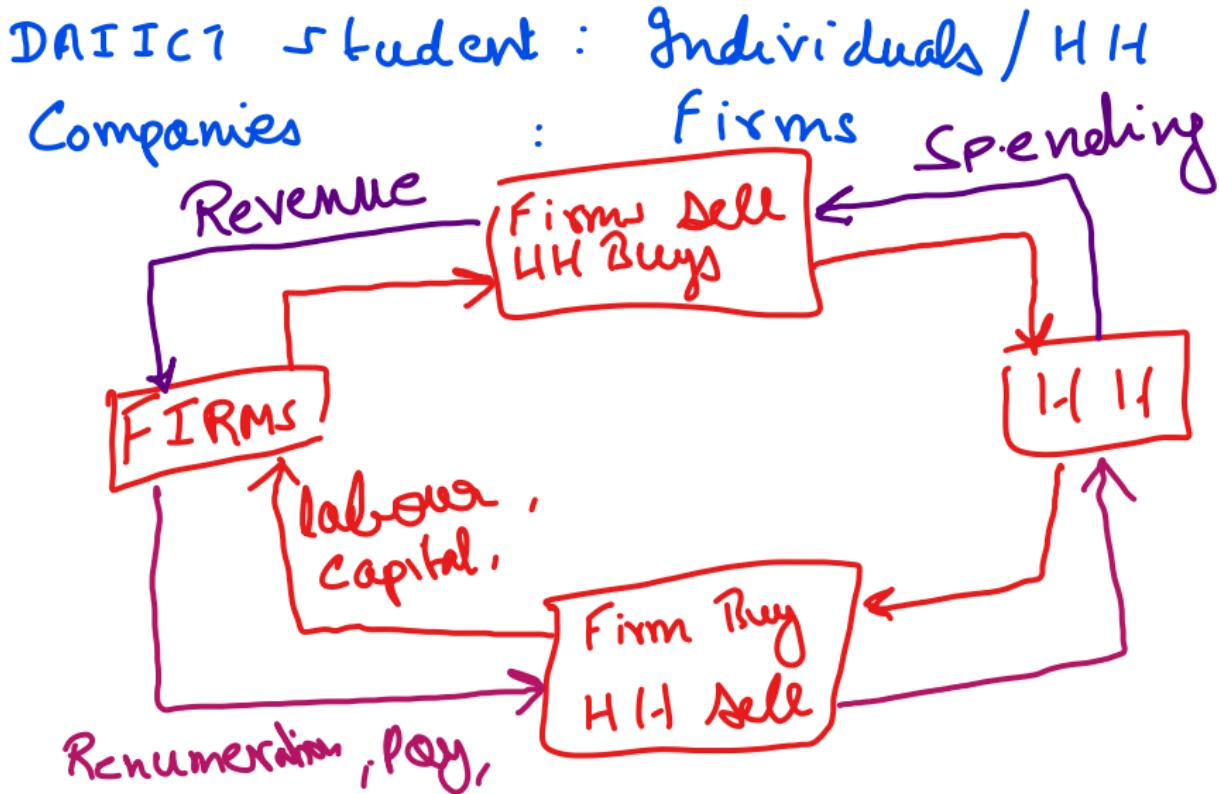
- What to Produce? → **Allocation**
- How to Produce? → **Production**

Three Basic Questions of Economics

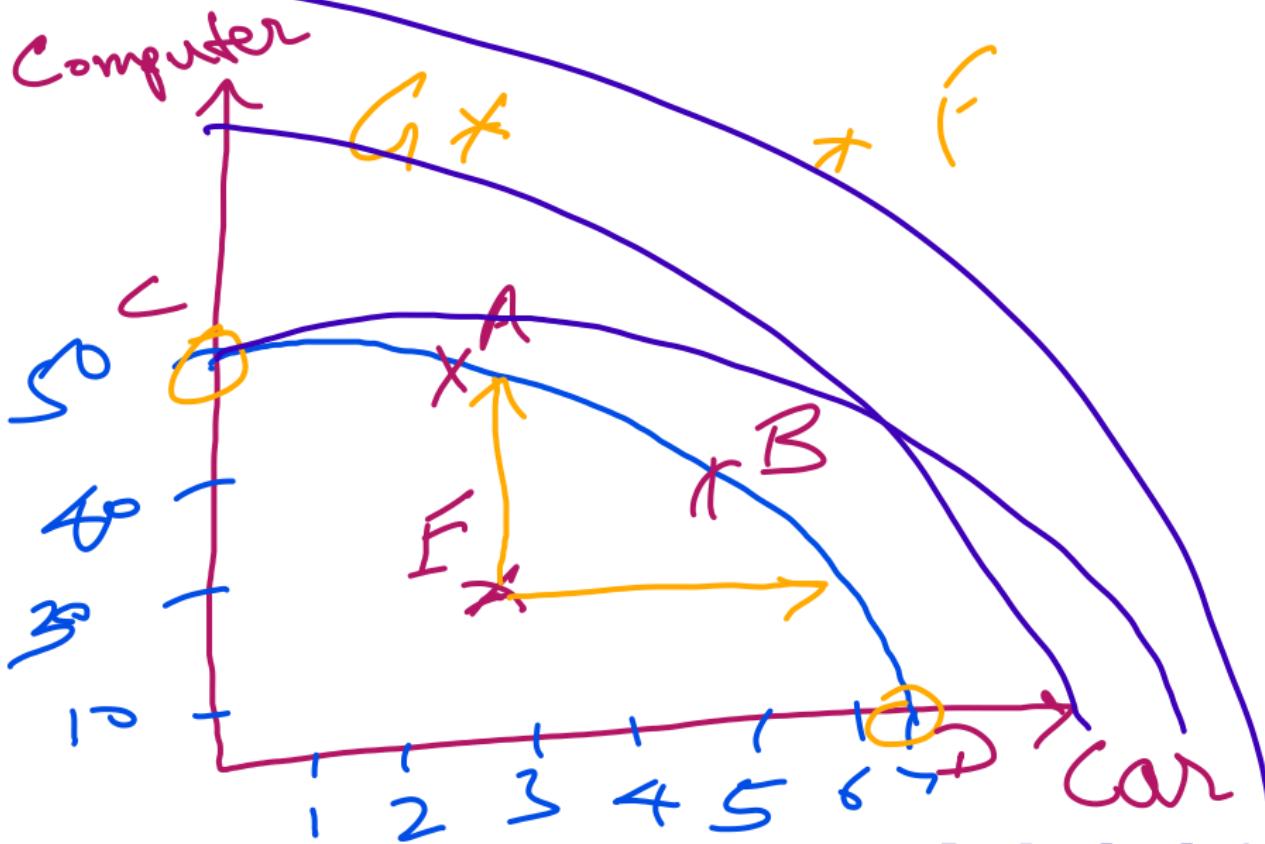
- What to Produce? → **Allocation**
- How to Produce? → **Production**
- For Whom to Produce? → **Distribution**

Economic Models

MODEL 1: THE CIRCULAR FLOW



MODEL 2: Production Possibility Frontier



Session Summary

THANK YOU

Principles of Economics

Topic 2: Demand and Supply

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Outline

- Demand and Supply
- What is a Market?
- What is a Competition?
- What is a Competitive Market?
- DEMAND: Law of Demand, Demand Schedule, Demand Curve
- Factors affecting Demand Curve
- An Application: Quantity of Smoking demanded

Have you pondered ...

- Why AC prices rises during the summers?

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- Why your Goa trip will cost you highest during Christmas and New Year?

Have you pondered ...

- Why AC prices rises during the summers?
- Why your Goa trip will cost you highest during Christmas and New Year?
- Why it is difficult (or takes longer) to get a place in a restaurant on a weekend than a weekday?

Have you pondered ...

- Why at specific time of day, say lunch, there is longer queue in the canteen?

Have you pondered ...

- Why at specific time of day, say lunch, there is longer queue in the canteen?
- Why there is higher airfare around festivals?

Demand!

All such phenomena has something to do with **DEMAND** and **SUPPLY**.

Increase in Demand

- More AC **demanded** during the summers.

Increase in Demand

- More AC **demanded** during the summers.
- More people **demanding** a party in Goa around the new-year.

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- More people **demanding** food during lunch.
- More people have travel **demand**.

Supply!

What about **SUPPLY**?

Demand and Supply

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What is a Market?

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- A market is a group of buyers and sellers of a particular good or service.
- The buyers as a group determine the demand for the product, and the sellers as a group determine the supply of the product.

What is Competition?

- When price of a good/service and the quantity of that good/service are not determined by any single buyer or seller. Rather, price and quantity are determined by all buyers and sellers as they interact in the marketplace.

What is Competition?

- Economists use the term competitive market to describe a market in which there are so many buyers and so many sellers that each has a negligible impact on the market price.
- we assume that markets are perfectly competitive.

Characteristics of a Competitive Market

Two characteristics of a Competitive Market

- ① the goods offered for sale are all exactly the same, and
- ② the buyers and sellers are so numerous that no single buyer or seller has any influence over the market price.

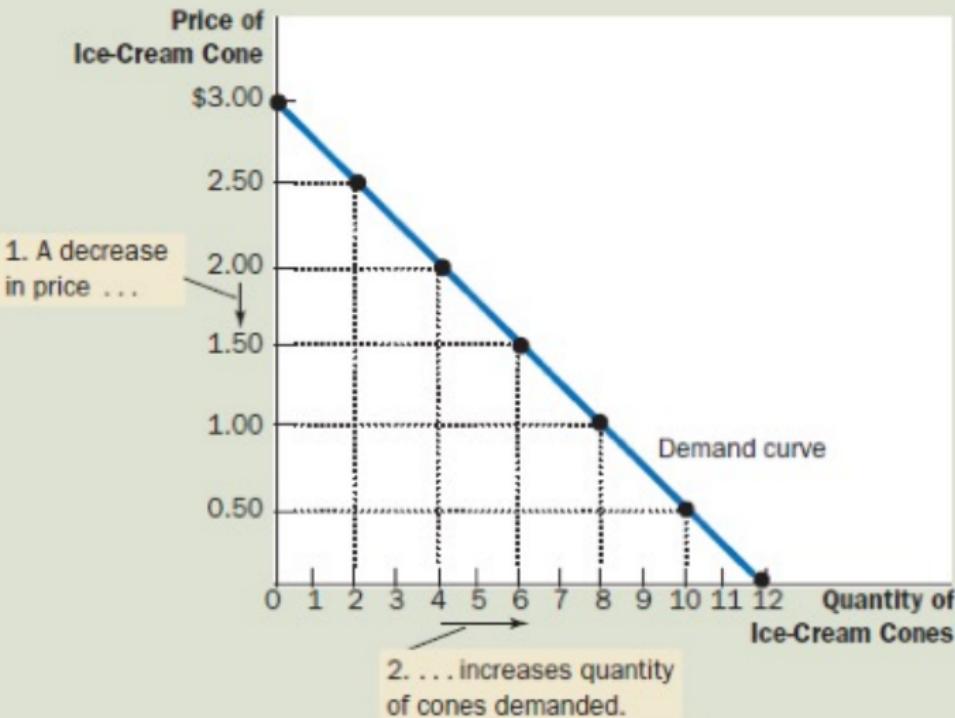
DEMAND

If Price Increases, Quantity Demanded Decreases, and Vice Versa (A Negative Relationship).

TODO: Demand Schedule: Ice-Cream Cone example

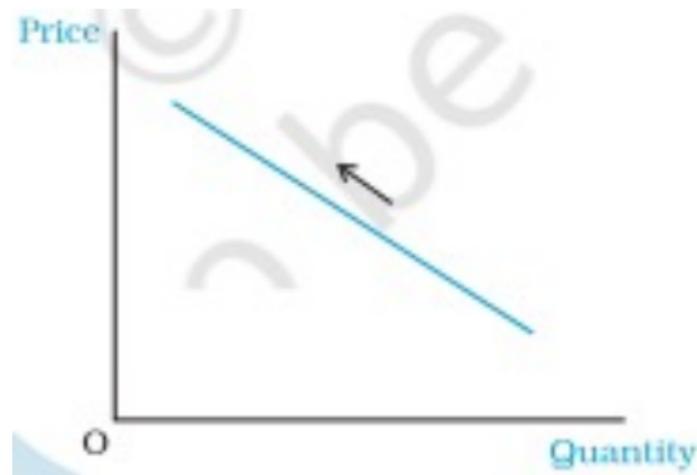
Demand Curve: Ice-Cream Cone example

Demand Curve: Individual



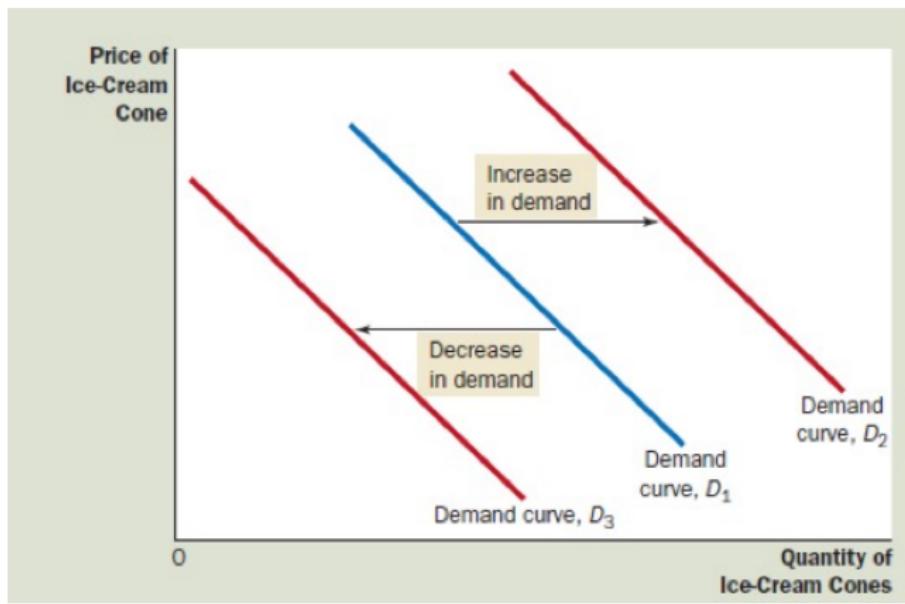
An aggregation of individuals demand curves.

Movement along the Demand Curve

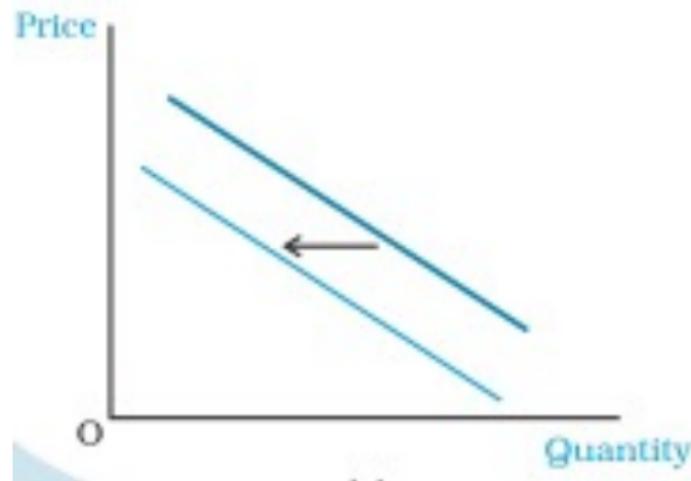


Shift in Demand Curve

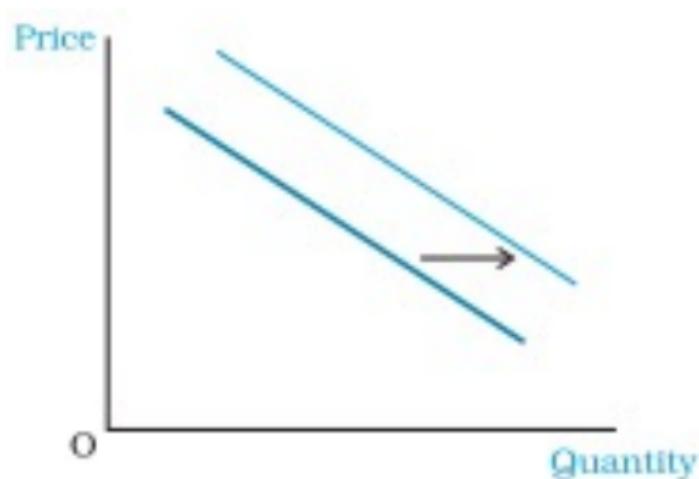
Any change (except prices) that either raises or lowers the quantity demanded.



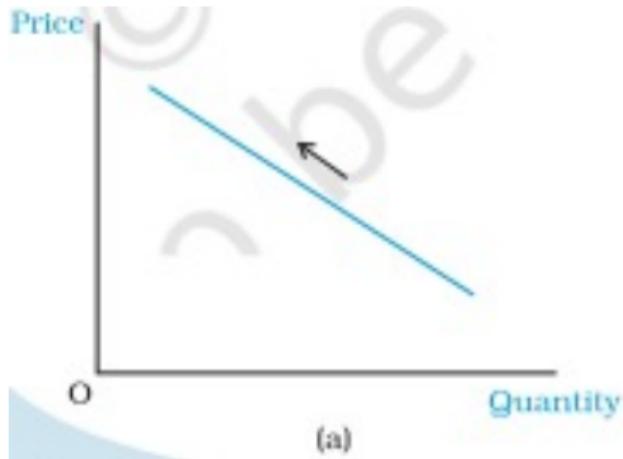
Shift in Demand Curve: Leftward



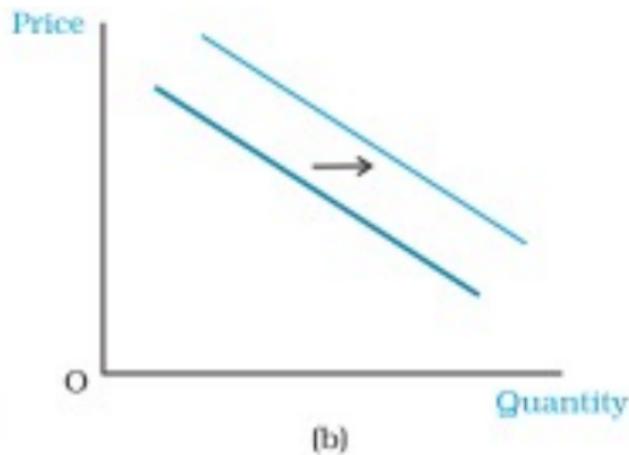
Shift in Demand Curve: Rightward



Movement versus Shift in Demand Curve



(a)



(b)

Panel (a) : movement along the demand curve

Panel (b) : a shift of the demand curve.

Income of the Consumer – Normal Goods and Inferior Goods.

Normal Good and Inferior Good

NORMAL GOOD

- If the demand for a good falls when income falls, the good is called a normal good.

Normal Good and Inferior Good

INFERIOR GOOD

- If the demand for a good rises when income falls, the good is called an inferior good.

Normal Good and Inferior Good

INFERIOR GOOD

- If the demand for a good rises when income falls, the good is called an inferior good.
- Example - bus rides. As your income falls, you are less likely to buy a car or take a cab and more likely to ride a bus.

- Income of the Consumer – Normal Goods and Inferior Goods.

Price of the Related Goods – **Substitute Goods** and **Complementary Goods**.

Substitute and Complementary Good

SUBSTITUTE GOOD

- When a fall in the price of one good reduces the demand for another good, the two goods are called substitutes.
- Example - Tea and coffee, Pizza and Burger.

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- When a fall in the price of one good reduces the demand for another good, the two goods are called substitutes.
- Example - Tea and coffee, Pizza and Burger.

$P_{COFFEE} \uparrow : D_{COFFEE} \downarrow : D_{TEA} \uparrow$

Substitute and Complementary Good

COMPLEMENTARY GOOD

- When a fall in the price of one good raises the demand for another good, the two goods are called complements.
- Example - Complements are often pairs of goods that are used together, such as gasoline and automobiles.

Substitute and Complementary Good

COMPLEMENTARY GOOD

- When a fall in the price of one good raises the demand for another good, the two goods are called complements.
- Example - Complements are often pairs of goods that are used together, such as gasoline and automobiles.

$P_{PETROL} \uparrow : D_{PETROL} \uparrow : D_{CAR} \uparrow$

- Income of the Consumer – Normal Goods and Inferior Goods.
- Price of the related Goods – Substitute Goods and Complementary Goods

Taste and Preferences

Taste and Preference

- The most obvious determinant of your demand is your tastes.
- Economists do not try to explain people's tastes but rather interested in examining what happens when tastes change.

- Income of the Consumer – Normal Goods and Inferior Goods.
- Price of the related Goods – Substitute Goods and Complementary Goods
- Taste and Preferences

Expectations

Expectations

- Your expectations about the future may affect your demand for a good or service today.

- Income of the Consumer – Normal Goods and Inferior Goods.
- Price of the related Goods – Substitute Goods and Complementary Goods
- Taste and Preferences
- Expectations

Number of Buyers

Number of Buyers

- Market demand depends on the number of buyers.
- For Examples, if more consumers of Ice-cream are demanding for ice-cream, the quantity demanded in the market will go higher.

- Income of the Consumer – Normal Goods and Inferior Goods.
- Price of the related Goods – Substitute Goods and Complementary Goods
- Taste and Preferences
- Expectations
- Number of Buyers

Natural Calamities (etc.)

Factors that affect the Demand Curve

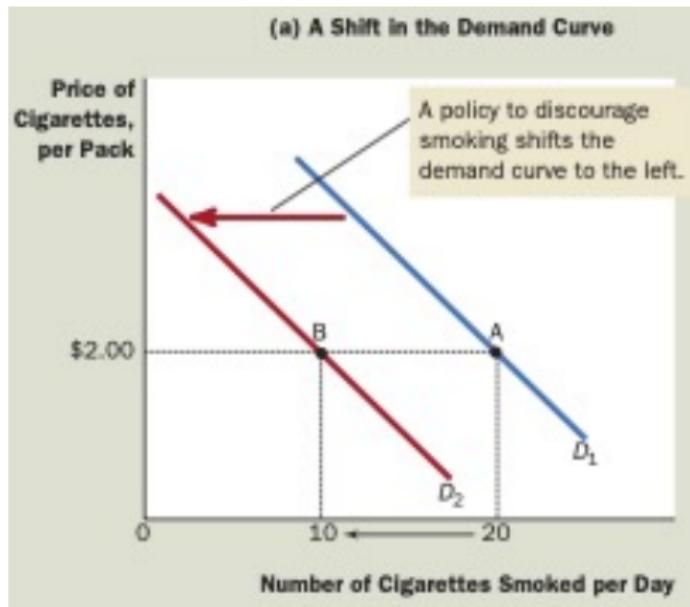
- Income of the Consumer – Normal Goods and Inferior Goods.
- Price of the related Goods – Substitute Goods and Complementary Goods
- Taste and Preferences
- Expectations
- Number of Buyers
- Natural Calamities (etc.)

Summary: DEMAND CURVE

- **(Movement along the curve):** The demand curve shows what happens to the quantity demanded of a good when its **price varies**, holding constant all the other variables that influence buyers.
- **(Shift the curve):** When one of these other (than prices) **variables changes**, the demand curve shifts.

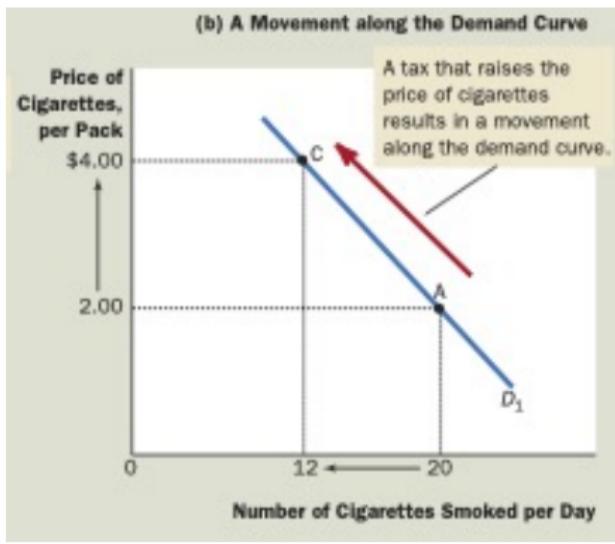
An Application: TWO WAYS TO REDUCE THE QUANTITY OF SMOKING DEMANDED

- Shift in the demand curve



An Application: TWO WAYS TO REDUCE THE QUANTITY OF SMOKING DEMANDED

- Raise the price: Movement along the Demand curve



Exceptions of Law of Demand

- Giffen Goods
- Veblen Goods
- Water – Diamond Paradox

Exceptions of Law of Demand

GIFFEN GOODS

- A Giffen good is a low-income, non-luxury product for which demand increases as the price increases and vice versa.
- A Giffen good has an upward-sloping demand curve which is contrary to the fundamental laws of demand which are downward sloping demand curve.

Exceptions of Law of Demand

GIFFEN GOODS: Example

Exceptions of Law of Demand

VEBLEN GOODS

- A Veblen good is a type of luxury good for which the demand increases as the price increases, in apparent contradiction of the law of demand, resulting in an upward-sloping demand curve.

SUPPLY

Supply

The amount of a good that sellers are willing and able to sell.

Law of Supply

(Other things equal/ Ceteris Paribus) If Price Increases, Quantity Supplied Increases, and Vice Versa (A Positive Relationship).

Supply Schedule

A table that shows the relationship between the price of a good and the quantity supplied.

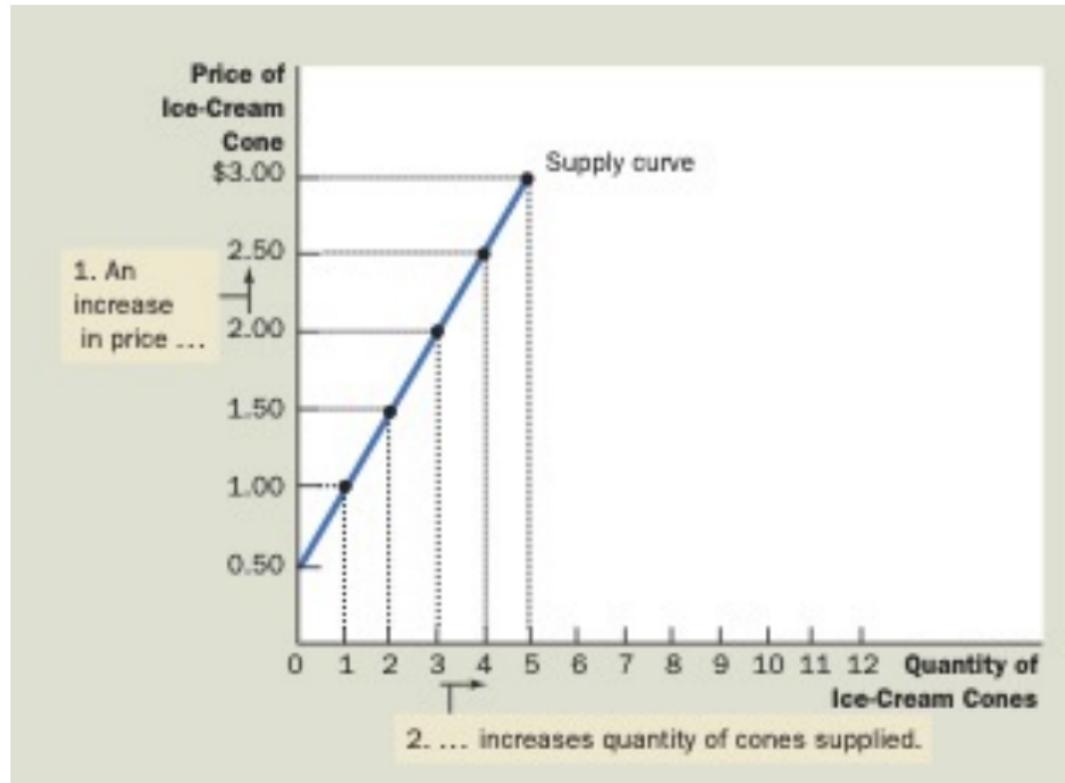
Supply Schedule

Price of Ice-Cream Cone	Quantity of Cones Supplied
\$0.00	0 cones
0.50	0
1.00	1
1.50	2
2.00	3
2.50	4
3.00	5

Supply Curve

- A graph of the relationship between the price of a good and the quantity supplied.

Supply Curve: Example



Supply Curve

- A graph of the relationship between the price of a good and the quantity supplied.
- The supply curve slopes upward because, other things equal, a higher price means a greater quantity supplied.

Market Supply versus Individual Supply

- Market supply is sum of individual supplies.

Shifts in the Supply Curve - 1/4

- Input Prices

Shifts in the Supply Curve

Input Prices

- When the price of one or more of these inputs rises, producing (ice cream) is less profitable, and firms supply less (ice cream).
- Thus, the supply of a good is negatively related to the price of the inputs used to make the good.

Shifts in the Supply Curve - 2/4

- Input Prices
- Technology

Shifts in the Supply Curve

Technology

- By reducing firms' costs, the advance in technology raised the supply of ice cream.

Shifts in the Supply Curve - 3/4

- Input Prices
- Technology
- Expectations

Shifts in the Supply Curve

Expectations

- For example, if a firm expects the price of ice cream to rise in the future, it will put some of its current production into storage and supply less to the market today.

Shifts in the Supply Curve - 4/4

- Input Prices
- Technology
- Expectations
- Number of Sellers

Shifts in the Supply Curve

Number of Sellers

- market supply depends on the number of these sellers

Shifts in the Supply Curve: Few Cases

A rise in the rate of excise duty

A fall in the rate of other goods

A fall in the price of factor inputs

Summary: Shifts versus movement in the Supply Curve

- To remember whether you need to shift or move along the supply curve, keep in mind that a curve shifts only when there is a change in a relevant variable that is not named on either axis.

Summary: Shifts versus movement in the Supply Curve

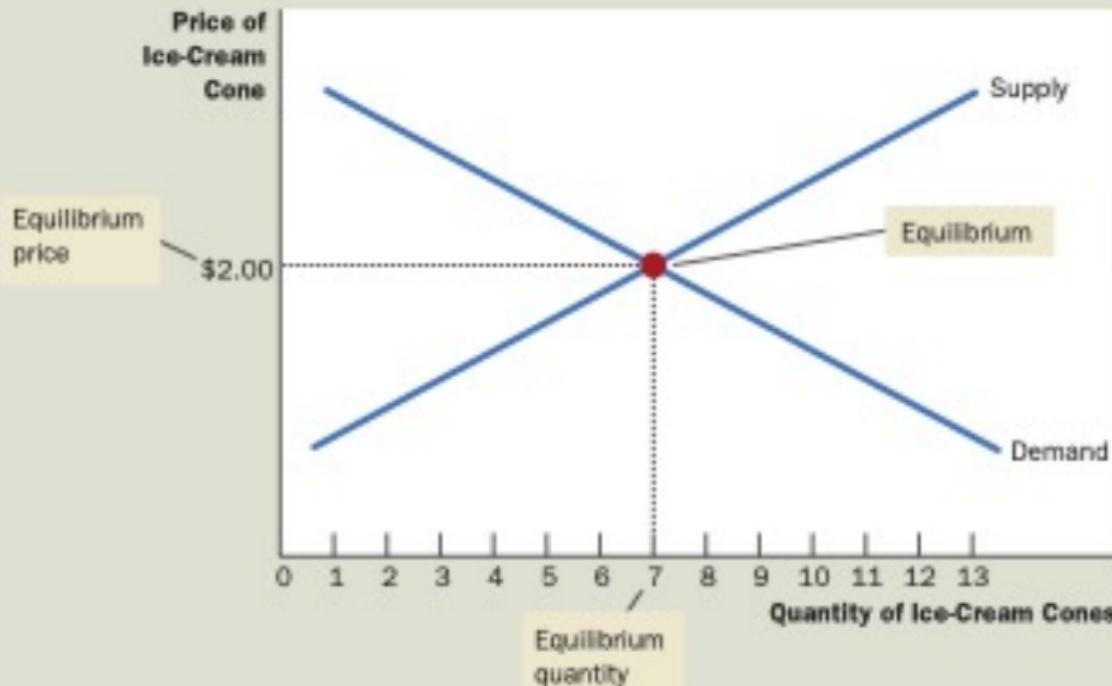
- The **price** is on the vertical axis, so a **change in price represents a movement** along the supply curve.
- By contrast, because **input prices, technology, expectations, and the number of sellers** are not measured on either axis, a **change in these variables shifts the supply curve**.

SUPPLY and DEMAND together: The Equilibrium

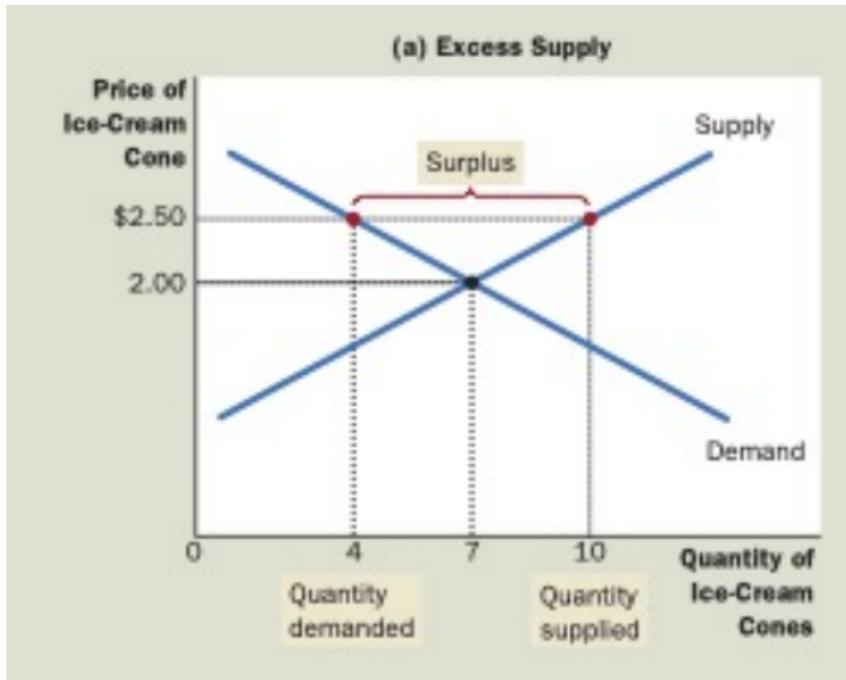
The Equilibrium of Supply and Demand

The equilibrium is found where the supply and demand curves intersect. At the equilibrium price, the quantity supplied equals the quantity demanded.

SUPPLY and DEMAND together: The Equilibrium



Markets NOT in Equilibrium: EXCESS SUPPLY



Markets NOT in Equilibrium: EXCESS DEMAND



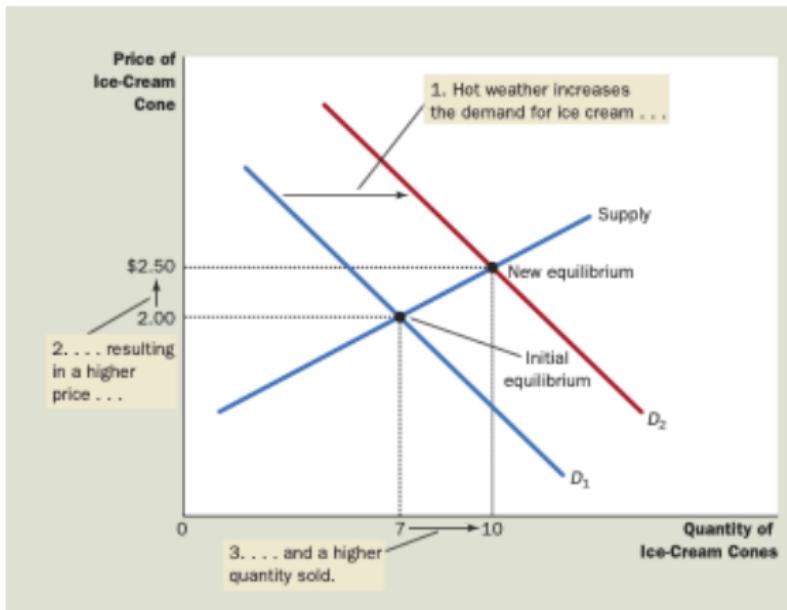
THREE STEPS TO ANALYZING CHANGES IN EQUILIBRIUM

A Change in Market Equilibrium Due to a Shift in Demand

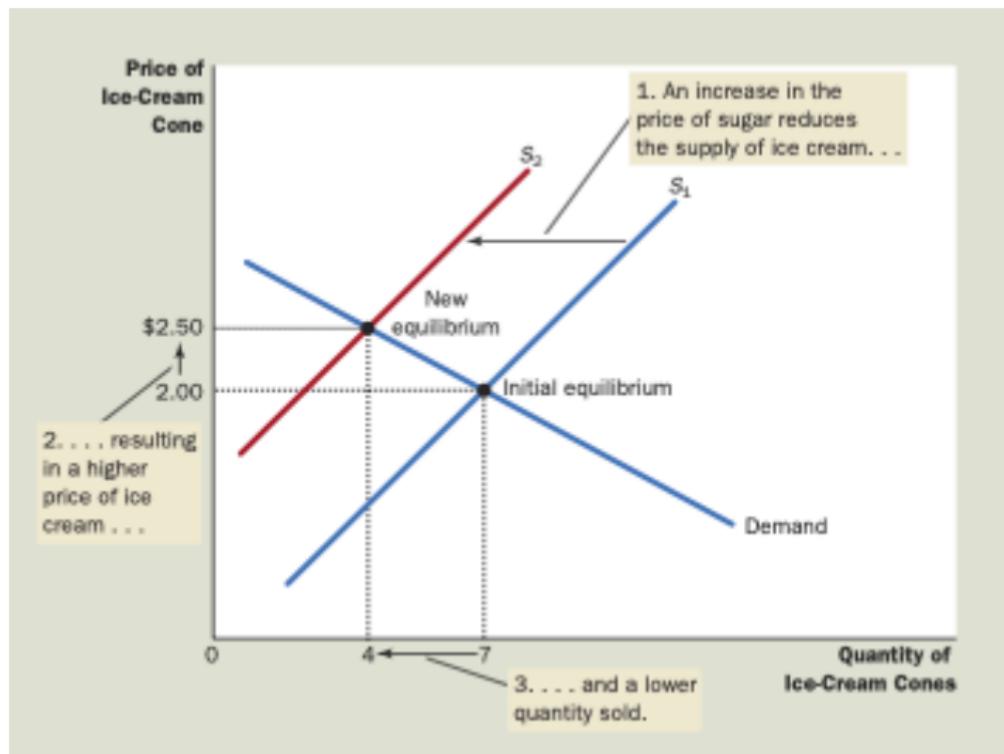
A Change in Market Equilibrium Due to a Shift in Supply

Shifts in Both Supply and Demand

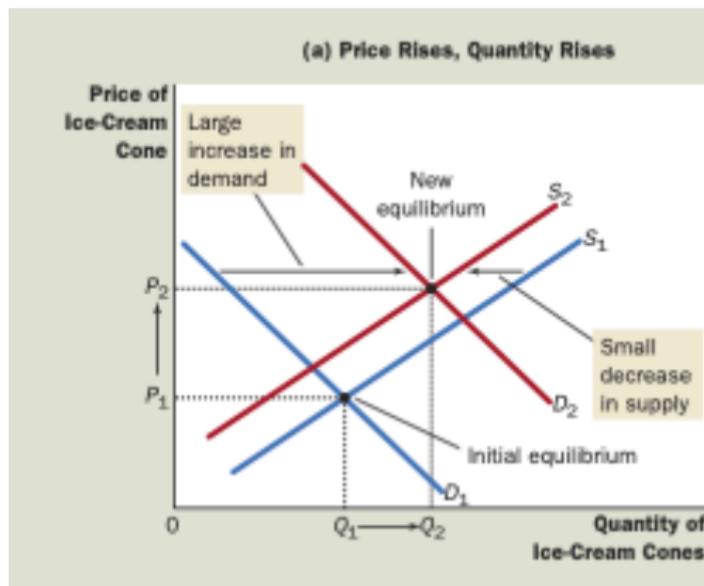
Case 1: How an Increase in Demand Affects the Equilibrium



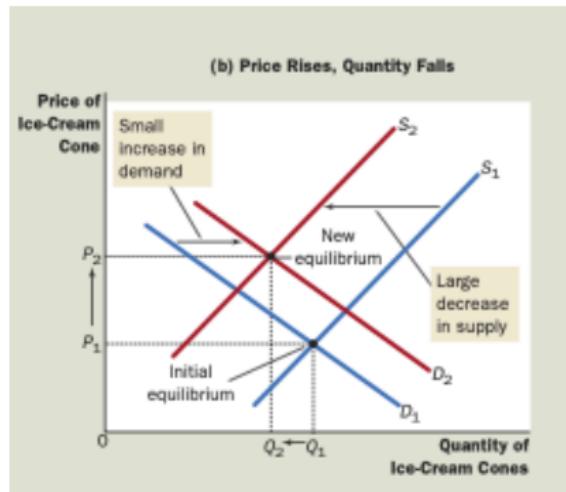
Case 2: How a Decrease in Supply Affects the Equilibrium



Case 3A: A Shift in Both Supply and Demand - (a) Price Rises, Quantity Rises



Case 3B: A Shift in Both Supply and Demand - (b) Price Rises, Quantity Falls



Session Summary

THANK YOU

Principles of Economics

Topic 3: Elasticity and Its Applications

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August: 18, 22 : 2022

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Outline

- Elasticity
- The Elasticity of Demand
- The Elasticity of Supply
- Applications of Supply, Demand and Elasticity

THE ELASTICITY

Law of Demand

- With increase in petrol price, the quantity demanded will?

Law of Demand

- With increase in petrol price, the quantity demanded will **Decrease**

Law of Demand (++)!

- With increase in petrol price, the quantity demanded will **Decrease**

But by how much?

Law of Demand (++)!

- With increase in petrol price, the quantity demanded will **Decrease**

But by how much?

This question can be answered using a concept called **elasticity**.

Law of Demand: A qualitative aspect of demand

- We noted that consumers usually buy more of a good when its price is lower, when their incomes are higher, when the prices of substitutes for the good are higher, or when the prices of complements of the good are lower.
- Our discussion of demand was qualitative, not quantitative. That is, we discussed the direction in which quantity demanded moves but not the size of the change.

To measure how much consumers respond to changes in variables, economists use the concept of elasticity.

Elasticity

- In economics, elasticity measures the percentage change of one economic variable in response to a percentage change in another.

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- For example, if a good's price elasticity of demand is -2, a 10% increase in price causes the quantity demanded to fall 20%
- **Elasticity is a measure of HOW MUCH** buyers and sellers respond to changes in market conditions.
- So, essentially we can discuss not only the direction of the effects but their magnitude as well.

THE ELASTICITY OF DEMAND

The Price Elasticity of Demand: **elastic** and **inelastic**

- The price elasticity of demand measures how much the quantity demanded responds to a change in price.
- Demand for a good is said to be **elastic** if the quantity demanded responds substantially to changes in the price.
- Demand is said to be **inelastic** if the quantity demanded responds only slightly to changes in the price.

The Price Elasticity of Demand: Visual Perspective

- The price elasticity of demand determines whether the demand curve is steep or flat.

The Price Elasticity of Demand: Determinants

- Availability of Close Substitutes

The Price Elasticity of Demand: Determinants

- Availability of Close Substitutes
- Necessities versus Luxuries

The Price Elasticity of Demand: Determinants

- Availability of Close Substitutes
- Necessities versus Luxuries
- Definition of the Market

TODO: The Price Elasticity of Demand: Determinants

- Availability of Close Substitutes
- Necessities versus Luxuries
- Definition of the Market
- Time Horizon

The Price Elasticity of Demand: Computing

- For demand,

$$\text{Price elasticity} = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

The Price Elasticity of Demand: Computing

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Price elasticity of demand

- Economists compute the price elasticity of demand as the percentage change in the quantity demanded divided by the percentage change in the price.

Computing The Price Elasticity of Demand: Midpoint Method - 1

The Problem: Difference in price elasticities

- Consider these numbers: Point A: Price = \$4, Quantity = 120 ;
Point B: Price = \$6, Quantity = 80
- The elasticity from point A to point B seems different from the elasticity from point B to point A.
- Going from point A to point B, the price rises by 50 percent, and the quantity falls by 33 percent, indicating that the price elasticity of demand is $33/50$, or 0.66. By contrast, going from point B to point A, the price falls by 33 percent, and the quantity rises by 50 percent, indicating that the price elasticity of demand is $50/33$, or 1.5. **This difference arises because the percentage changes are calculated from a different base.**

Computing The Price Elasticity of Demand: Midpoint Method - 2

The Alternate: **The Midpoint Method**

- The standard procedure for computing a percentage change is to divide the change by the initial level.
- By contrast, **the midpoint method computes a percentage change by dividing the change by the midpoint (or average) of the initial and final levels.**
- For instance, \$5 is the midpoint between \$4 and \$6. Therefore, according to the midpoint method, a change from \$4 to \$6 is considered a 40 per- cent rise because $(6 - 4) / 5 \times 100 = 40$. Similarly, a change from \$6 to \$4 is considered a 40 percent fall.

Computing The Price Elasticity of Demand: Midpoint Method - 3

The Midpoint Method: Formula

- The midpoint method for calculating the price elasticity of demand between two points, denoted (Q_1, P_1) and (Q_2, P_2) :
- Price elasticity =
$$\frac{(Q_2 - Q_1)/[(Q_2 + Q_1)/2]}{(P_2 - P_1) / [(P_2 + P_1) / 2]}$$

THE VARIETY OF DEMAND CURVES

- **Demand is considered elastic** when the elasticity is greater than 1, which means the quantity moves proportionately more than the price.

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- **Demand is considered elastic** when the elasticity is greater than 1, which means the quantity moves proportionately more than the price.
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THE VARIETY OF DEMAND CURVES

- **Demand is considered elastic** when the elasticity is greater than 1, which means the quantity moves proportionately more than the price.
- **Demand is considered inelastic** when the elasticity is less than 1, which means the quantity moves proportionately less than the price.
- **Demand is considered unit elastic** If the elasticity is exactly 1 i.e. the quantity moves the same amount proportionately as the price.

THE VARIETY OF DEMAND CURVES-1: Steepness, Flatness - A Visual Perspective

(a) Perfectly Inelastic Demand: Elasticity Equals 0

THE VARIETY OF DEMAND CURVES-2: Steepness, Flatness - A Visual Perspective

(b) Inelastic Demand: Elasticity Is Less Than 1

Price

THE VARIETY OF DEMAND CURVES-3: Steepness, Flatness - A Visual Perspective

(c) Unit Elastic Demand: Elasticity Equals 1

Price

THE VARIETY OF DEMAND CURVES-4: Steepness, Flatness - A Visual Perspective

(d) Elastic Demand: Elasticity Is Greater Than 1

Price |

THE VARIETY OF DEMAND CURVES-5: Steepness, Flatness - A Visual Perspective

(e) Perfectly Elastic Demand: Elasticity Equals Infinity

(e)

Price |

Total Revenue and The Price Elasticity of Demand

- Total revenue the amount paid by buyers and received by sellers of a good, computed as the price of the good times the quantity sold.

Total Revenue and The Price Elasticity of Demand

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How does total revenue change as one moves along the demand curve?

Total Revenue and The Price Elasticity of Demand

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Total Revenue and The Price Elasticity of Demand

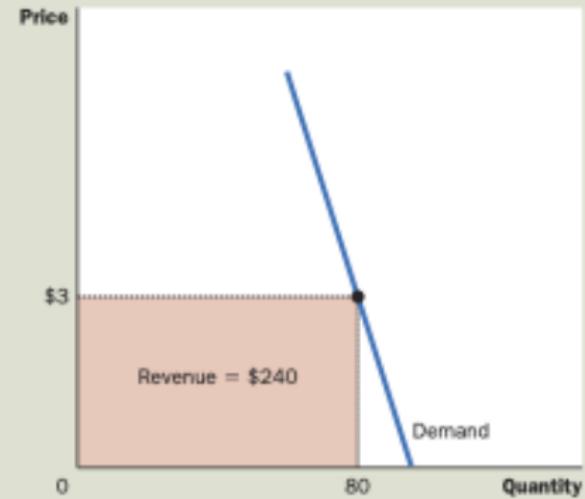
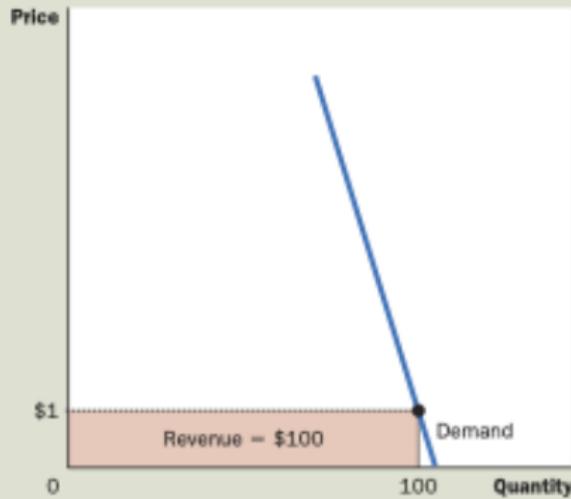
- Total revenue the amount paid by buyers and received by sellers of a good, computed as the price of the good times the quantity sold.

How does total revenue change as one moves along the demand curve?

- If demand is inelastic, then an increase in the price causes an increase in total revenue.
- if demand is elastic, then an increase in the price causes a decrease in total revenue.

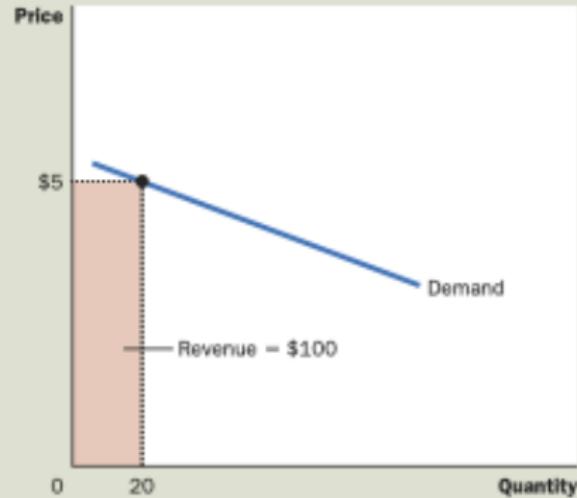
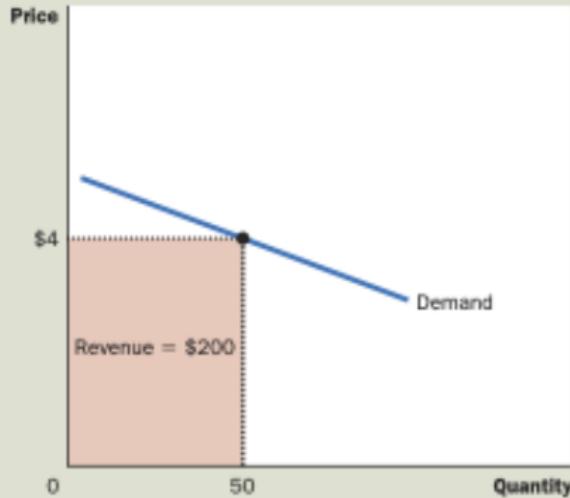
Total Revenue and The Price Elasticity of Demand: Inelastic

(a) The Case of Inelastic Demand



Total Revenue and The Price Elasticity of Demand: elastic

(b) The Case of Elastic Demand



ELASTICITY AND TOTAL REVENUE ALONG A LINEAR DEMAND CURVE

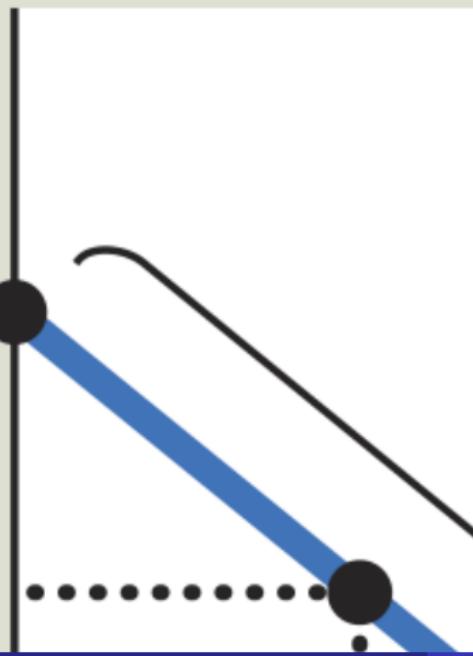
- Even though the slope of a linear demand curve is constant, the elasticity is not. This is true because the slope is the ratio of changes in the two variables, whereas the elasticity is the ratio of percentage changes in the two variables.

ELASTICITY AND TOTAL REVENUE ALONG A LINEAR DEMAND CURVE: An illustration

Price

\$7

6



Elasticity is larger than one

PRICE ELASTICITY ALONG A LINEAR DEMAND CURVE: Summary

- What happens to the price elasticity of demand when we travel along the demand curve? The answer depends on the nature of the demand curve itself. On a linear demand curve, elasticity becomes smaller (in absolute value) as we travel downward and to the right.
- The price elasticity of demand varies between different pairs of points along a linear demand curve. The lower the price and the greater the quantity demanded, the lower the absolute value of the price elasticity of demand.

On a linear demand curve, the price elasticity of demand varies depending on the interval over which we are measuring it. For any linear demand curve, the absolute value of the price elasticity of demand will fall as we move down and to the right along the curve.

Other Demand Elasticities: Income Elasticity

- The **income elasticity of demand** measures how the quantity demanded changes as consumer income changes

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

Other Demand Elasticities: Income Elasticity

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Normal goods have positive income elasticities

- most goods are normal goods: Higher income raises the quantity demanded. Because quantity demanded and income move in the same direction, normal goods have positive income elasticities.

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Normal goods have positive income elasticities

- most goods are normal goods: Higher income raises the quantity demanded. Because quantity demanded and income move in the same direction, normal goods have positive income elasticities.

Inferior goods have negative income elasticities

- A few goods, such as bus rides, are inferior goods: Higher income lowers the quantity demanded. Because quantity demanded and income move in opposite directions, inferior goods have negative income elasticities.

Other Demand Elasticities: **Cross-Price Elasticity**

- The **cross-price elasticity of demand** measures how the quantity demanded of one good responds to a change in the price of another good.

$$\text{Cross-price elasticity} = \frac{\text{Percentage change in quantity demanded of good 1}}{\text{Percentage change in the price of good 2}}$$

Whether the cross-price elasticity is a positive or negative number depends on whether the two goods are substitutes or complements.

Other Demand Elasticities: **Cross-Price Elasticity**

Whether the cross-price elasticity is a positive or negative number depends on whether the two goods are substitutes or complements.

Substitutes goods have positive cross-price elasticity

- An increase in coffee prices induces people to choose tea instead. Because the price of coffee and the quantity of tea demanded move in the same direction.

Complement goods have negative cross-price elasticity

- An increase in petrol prices reduces the quantity of petrol engine cars demanded.

THE ELASTICITY OF SUPPLY

THE ELASTICITY OF SUPPLY

The law of supply states that higher prices raise the quantity supplied. The price elasticity of supply measures how much the quantity supplied responds to changes in the price.

Price Elasticity of Supply

- a measure of how much the quantity supplied of a good responds to a change in the price of that good, computed as the percentage change in quantity supplied divided by the percentage change in price.

Elasticity of Supply: Elastic and Inelastic

Elastic and Inelastic Supply

- Supply of a good is said to be elastic if the quantity supplied responds substantially to changes in the price.
- Supply is said to be inelastic if the quantity supplied responds only slightly to changes in the price.

Key determinant of the price elasticity of supply: TIME

Supply Elasticity in Long Run and Short Run

- Supply is usually more elastic in the long run than in the short run.
- Over short periods of time, firms cannot easily change the size of their factories to make more or less of a good. Thus, in the short run, the quantity supplied is not very responsive to the price.
- By contrast, over longer periods, firms can build new factories or close old ones. In addition, new firms can enter a market, and old firms can shut down. Thus, in the long run, the quantity supplied can respond substantially to price changes.

COMPUTING THE PRICE ELASTICITY OF SUPPLY

- For Supply,

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

Price elasticity of Supply

- Economists compute the price elasticity of supply as the percentage change in the quantity supplied divided by the percentage change in the price.

COMPUTING THE PRICE ELASTICITY OF SUPPLY: An Example

- For example, suppose that an increase in the price of milk from \$2.85 to \$3.15 a gallon raises the amount that dairy farmers produce from 9,000 to 11,000 gallons per month.
- Using the midpoint method, we calculate the percentage change in price as,
 - Percentage change in price = $(3.15 - 2.85) / 3.00 \times 100 = 10$ percent.
 - Percentage change in quantity supplied = $(11,000 - 9,000) / 10,000 \times 100 = 20$ percent.
 - Price elasticity of supply = $\frac{20 \text{ percent}}{10 \text{ percent}} = 2.0$.

In this example, the elasticity of 2 indicates that the quantity supplied changes proportionately twice as much as the price.

THE VARIETY OF SUPPLY CURVES-1: Steepness, Flatness - A Visual Perspective

(a) Perfectly Inelastic Supply: Elasticity Equals 0

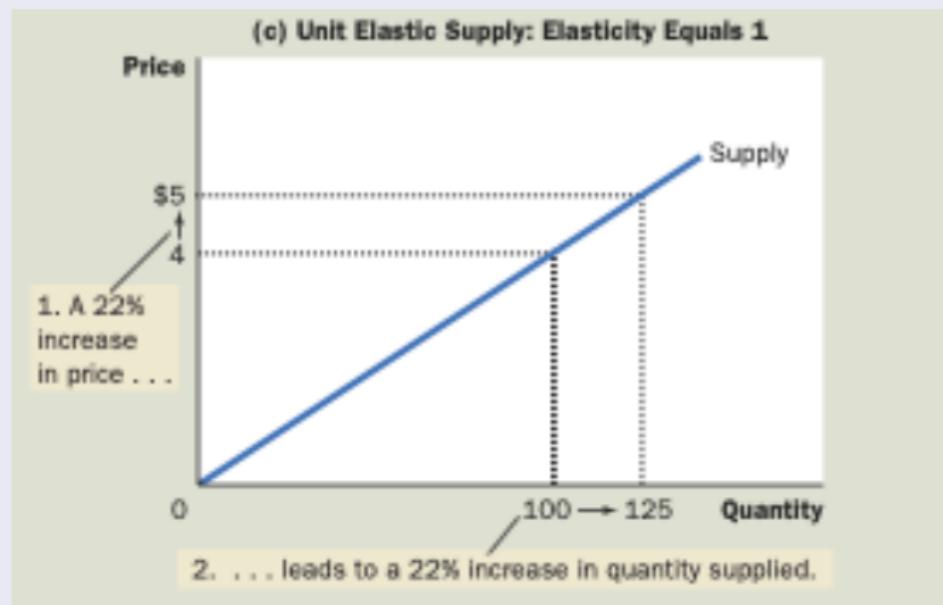
THE VARIETY OF SUPPLY CURVES-2: Steepness, Flatness - A Visual Perspective

(b) Inelastic Supply: Elasticity Is Less Than 1

Price

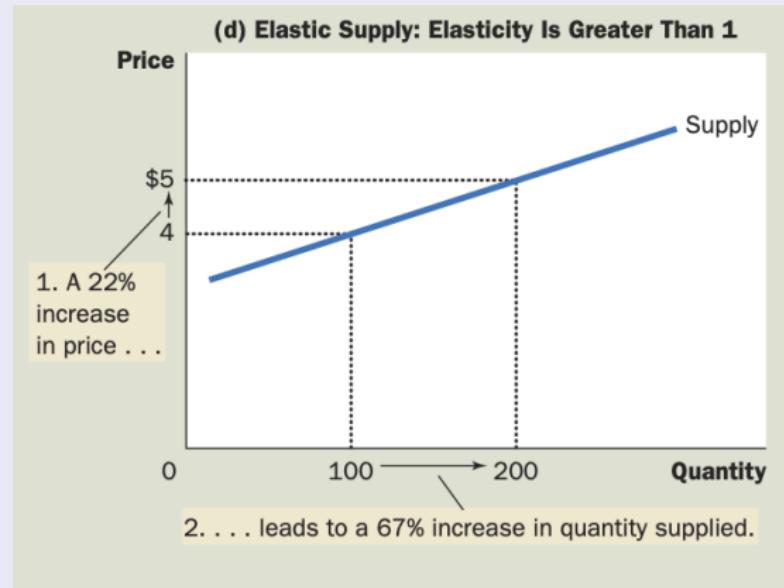
THE VARIETY OF SUPPLY CURVES-3: Steepness, Flatness - A Visual Perspective

(c) Unit Elastic Supply: Elasticity Equals 1



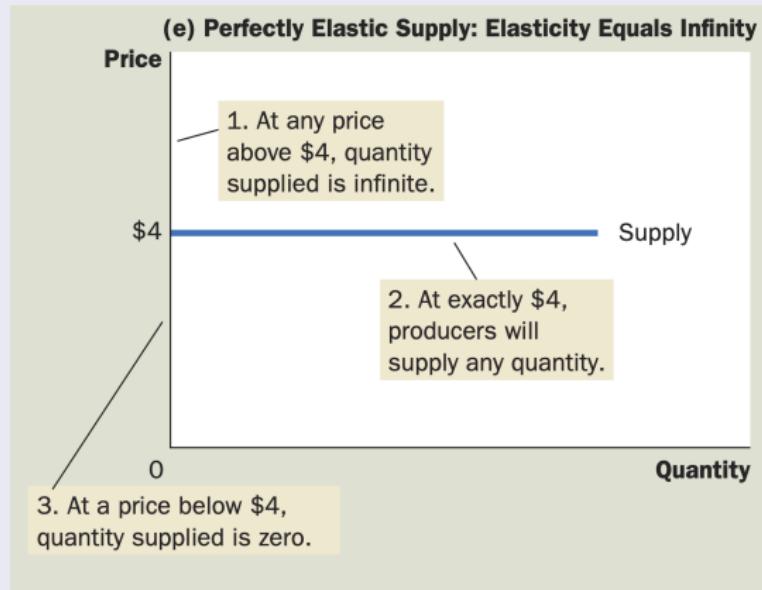
THE VARIETY OF SUPPLY CURVES-4: Steepness, Flatness - A Visual Perspective

(d) Elastic Supply: Elasticity Is Greater Than 1



THE VARIETY OF SUPPLY CURVES-5: Steepness, Flatness - A Visual Perspective

(e) Perfectly Elastic Supply: Elasticity Equals Infinity

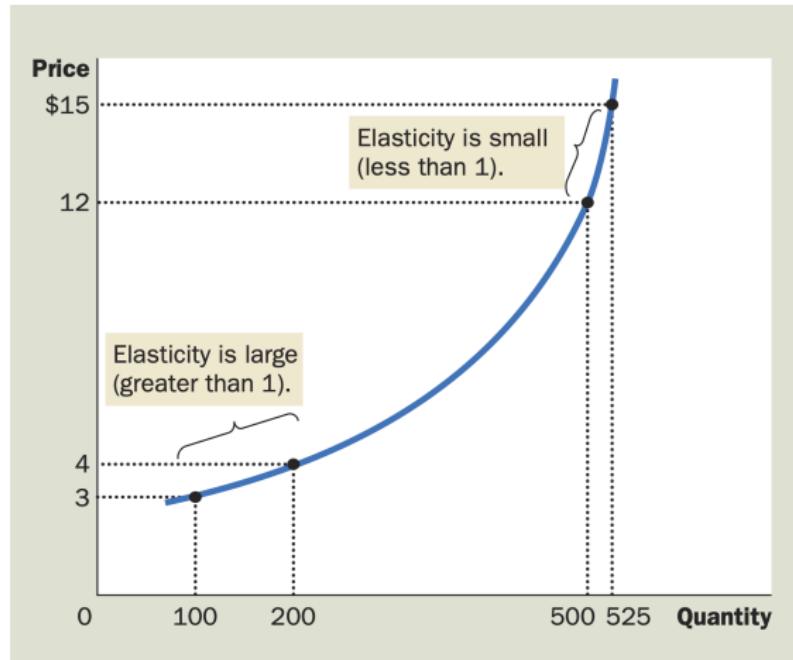


Elasticity of Supply is not Constant! - 1

How the Price Elasticity of Supply Can Vary

- How the Price Elasticity of Supply Can Vary Because firms often have a maximum capacity for production, the elasticity of supply may be very high at low levels of quantity supplied and very low at high levels of quantity supplied.
- Here an increase in price from \$3 to \$4 increases the quantity supplied from 100 to 200. Because the 67 percent increase in quantity supplied (computed using the midpoint method) is larger than the 29 percent increase in price, the supply curve is elastic in this range.
- By contrast, when the price rises from \$12 to \$15, the quantity supplied rises only from 500 to 525. Because the 5 percent increase in quantity supplied is smaller than the 22 percent increase in price, the supply curve is inelastic in this range.

Elasticity of Supply is not Constant! - 2



Three Applications of Supply, Demand, and Elasticity

- CAN GOOD NEWS FOR FARMING BE BAD NEWS FOR FARMERS?
- WHY DID OPEC FAIL TO KEEP THE PRICE OF OIL HIGH?
- DOES DRUG INTERDICTION INCREASE OR DECREASE DRUG-RELATED CRIME?

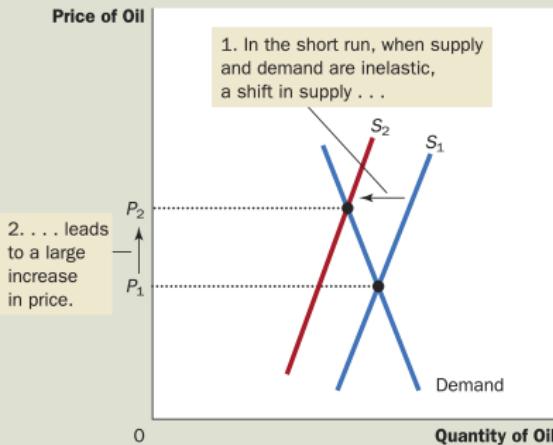
WHY DID OPEC FAIL TO KEEP THE PRICE OF OIL HIGH?

8 FIGURE

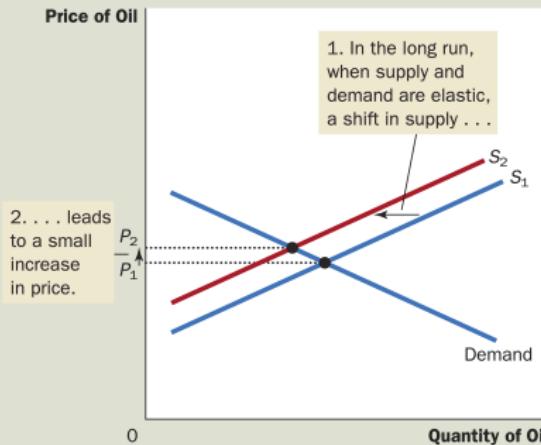
A Reduction in Supply in the World Market for Oil

When the supply of oil falls, the response depends on the time horizon. In the short run, supply and demand are relatively inelastic, as in panel (a). Thus, when the supply curve shifts from S_1 to S_2 , the price rises substantially. By contrast, in the long run, supply and demand are relatively elastic, as in panel (b). In this case, the same size shift in the supply curve (S_1 to S_2) causes a smaller increase in the price.

(a) The Oil Market in the Short Run



(b) The Oil Market in the Long Run



CONCLUSION

According to an old quip, even a parrot can become an economist simply by learning to say “supply and demand.” These last two chapters should have convinced you that there is much truth in this statement. The tools of supply and demand allow you to analyze many of the most important events and policies that shape the economy. You are now well on your way to becoming an economist (or at least a well-educated parrot).

Session Summary

THANK YOU

Principles of Economics

Topic-5: The Costs of Production

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Outline

- What are Costs? - Total revenue, total cost, and profit
- Production and Costs
- The various measures of cost:
- Cost in the short run and in the long run
- (Economies/ Disconomies/ Constant return) Scale: long-run average-total-cost curve

What are Costs? - Total revenue, total cost, and profit

Law of Supply and Firms Behavior

- The economy is made up of thousands of firms that produce the goods and services you enjoy every day.
- According to the law of supply, firms are willing to produce and sell a greater quantity of a good when the price of the good is higher, and this response leads to a supply curve that slopes upward.
- Now, we examine firm behavior in more detail - a better understanding of the decisions behind the supply curve.
- Basically, it is a part of economics called **industrial organization** — the study of how firms' decisions about prices and quantities depend on the market conditions they face.

How does the number of firms affect the prices in a market and the efficiency of the market outcome?

The field of industrial organization addresses exactly this question.

Cost of Productions

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What is a firm's objective?

(Economists): *The goal of a firm is to maximize profit.*

Total Revenue, Total Cost, and Profit

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Profit: is a firm's total revenue minus its total cost

$$\boxed{\text{Profit} = \text{Total revenue} - \text{Total cost}}$$

Costs As Opportunity Costs

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- **Implicit cost:** Those opportunity costs that do not require a cash outlay.

Difference between economists and accountants

“Cost Perspective”

The difference between economists and accountants is easy to see in the case of Caroline's Cookie Factory. When Caroline gives up the opportunity to earn money as a computer programmer, her accountant will not count this as a cost of her cookie business. Because no money flows out of the business to pay for this cost, it never shows up on the accountant's financial statements. An economist, however, will count the forgone income as a cost because it will affect the decisions that Caroline makes in her cookie business.

Economic Profit Versus Accounting Profit-1

- **Economic Profit:** firm's total revenue minus all the opportunity costs (explicit and implicit).
- **Accounting Profit:** firm's total revenue minus only the firm's explicit costs.

Economic Profit Versus Accounting Profit-2

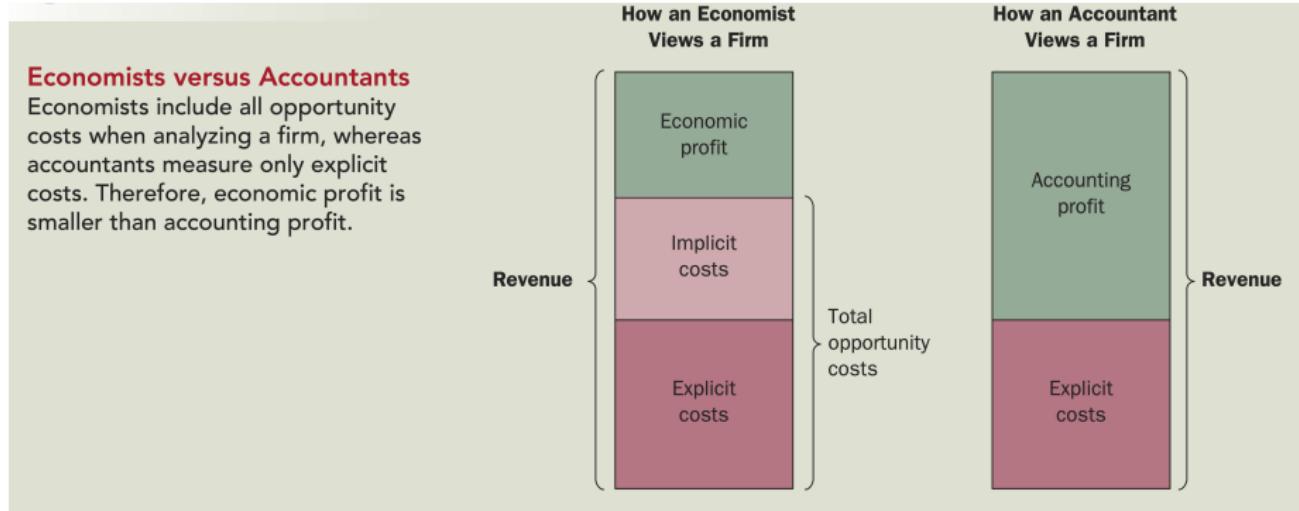


Figure: Economic Profit Versus Accounting Profit

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PRODUCTION AND COSTS

PRODUCTION AND COSTS: The Production Function

Firms incur costs when they buy inputs to produce the goods and services that they plan to sell.

The Production Function: The link between a firm's production process and its total cost

- This relationship between the quantity of inputs (workers) and quantity of output (cookies) is called the production function.

The Production Function

Let us see how the quantity of cookies produced per hour at Caroline's factory depends on the number of workers.

Number of Workers	Output (quantity of cookies produced per hour)	Marginal Product of Labor	Cost of Factory	Cost of Workers	Total Cost of Inputs (cost of factory + cost of workers)	A Production Function and Total Cost: Caroline's Cookie Factory
0	0	50	\$30	\$0	\$30	
1	50	40	30	10	40	
2	90	30	30	20	50	
3	120	20	30	30	60	
4	140	10	30	40	70	
5	150	5	30	50	80	
6	155		30	60	90	

- This relationship between the quantity of inputs and quantity of output is called the **production function**.

The Production Function and Diminishing Marginal Productivity - 1

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- For Example, When the number of workers goes from 1 to 2, cookie production increases from 50 to 90, so the marginal product of the second worker is 40 cookies.

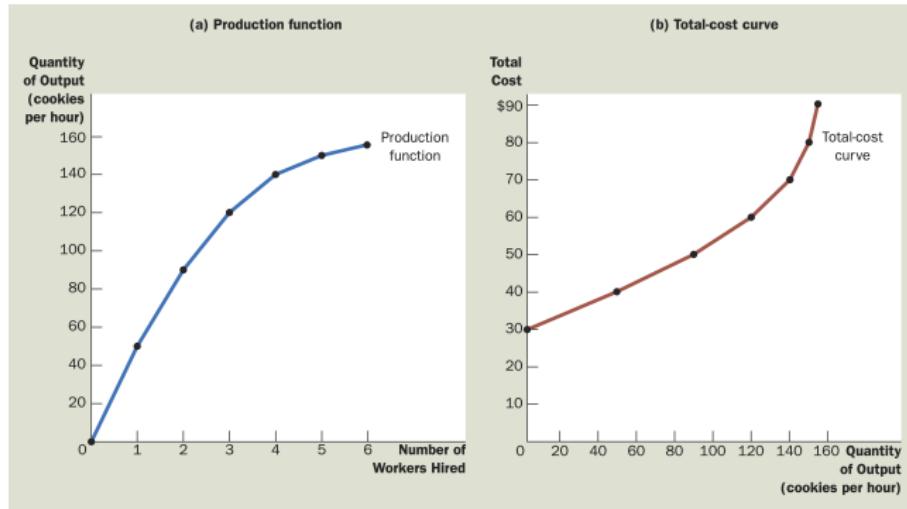
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As the number of workers increases, the marginal product declines.
This property is called **diminishing marginal product**.

The Production Function and Diminishing Marginal Productivity - 2



The slope of the production function measures the marginal product of a worker. As the number of workers increases, the marginal product declines, and the production function becomes flatter.

THE VARIOUS MEASURES OF COST

Total Cost: Fixed and Variable Costs

Fixed Costs

Cost that do not vary with the quantity of output produced. For example, All the capital investments. Like DAIICT campus area.

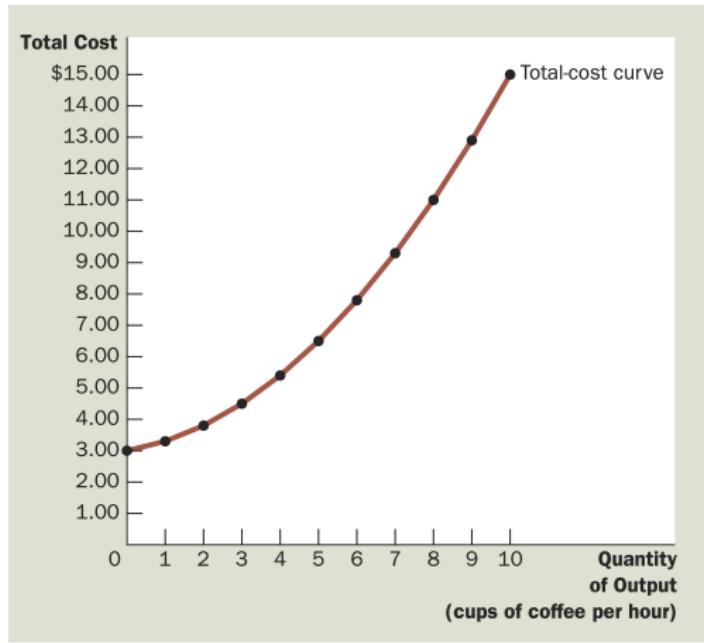
Variable Costs

Cost that change as the firm alters the quantity of output produced.

Total Costs

A firm's total cost is the sum of fixed and variable costs.

Total Cost: Fixed and Variable Costs



Can you identify Fixed cost, Variable cost and total cost?

Average and Marginal Cost

Average Costs

- Average Total Costs: total cost divided by the quantity of output.
- Average Fixed Costs: fixed cost divided by the quantity of output.
- Average Variable Costs: variable cost divided by the quantity of output.

Marginal Cost

The increase in total cost that arises from an extra unit of production

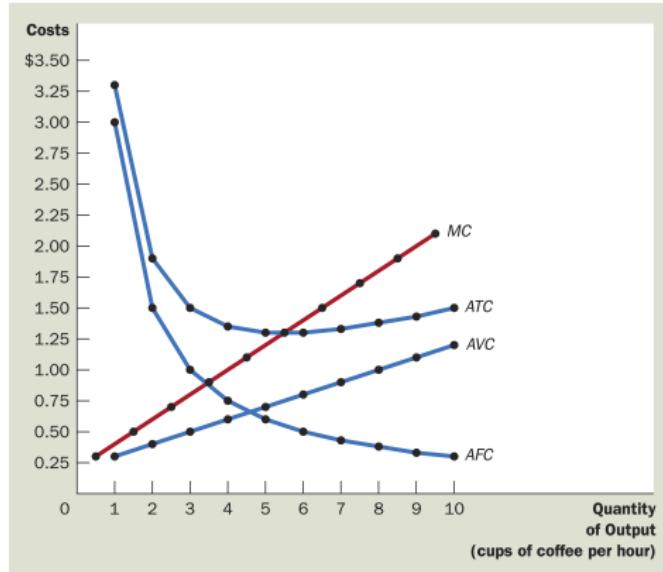
The Various Measures of Cost: An illustration

Quantity of Coffee (cups per hour)	Total Cost	Fixed Cost	Variable Cost	Average Fixed Cost	Average Variable Cost	Average Total Cost	Marginal Cost
0	\$ 3.00	\$3.00	\$ 0.00	—	—	—	\$0.30
1	3.30	3.00	0.30	\$3.00	\$0.30	\$3.30	0.50
2	3.80	3.00	0.80	1.50	0.40	1.90	0.70
3	4.50	3.00	1.50	1.00	0.50	1.50	0.90
4	5.40	3.00	2.40	0.75	0.60	1.35	1.10
5	6.50	3.00	3.50	0.60	0.70	1.30	1.30
6	7.80	3.00	4.80	0.50	0.80	1.30	1.50
7	9.30	3.00	6.30	0.43	0.90	1.33	1.70
8	11.00	3.00	8.00	0.38	1.00	1.38	1.90
9	12.90	3.00	9.90	0.33	1.10	1.43	2.10
10	15.00	3.00	12.00	0.30	1.20	1.50	

Costs: Formulas/Summary

Term	Definition	Mathematical Description	The Many Types of Cost: A Summary
Explicit costs	Costs that require an outlay of money by the firm		
Implicit costs	Costs that do not require an outlay of money by the firm		
Fixed costs	Costs that do not vary with the quantity of output produced	FC	
Variable costs	Costs that vary with the quantity of output produced	VC	
Total cost	The market value of all the inputs that a firm uses in production	$TC = FC + VC$	
Average fixed cost	Fixed cost divided by the quantity of output	$AFC = FC / Q$	
Average variable cost	Variable cost divided by the quantity of output	$AVC = VC / Q$	
Average total cost	Total cost divided by the quantity of output	$ATC = TC / Q$	
Marginal cost	The increase in total cost that arises from an extra unit of production	$MC = \Delta TC / \Delta Q$	

Cost Curves and Their Shapes



Three features:

- the shape of the marginal-cost curve,
- the shape of the average-total-cost curve, and
- the relationship between marginal and average total cost.

Discussion: Rising Marginal Cost

The marginal cost rises with the quantity of output produced. This reflects the property of diminishing marginal product.

- When the quantity of a product (say coffee) produced is at low level, the marginal product of an extra worker is high, and the marginal cost of an extra unit of product (extra cup of coffee) is small.
- When the quantity of a product (say coffee) produced is already high, the marginal product of an extra worker is low, and the marginal cost of an extra unit of product (extra cup of coffee) is large.

Discussion: U-Shaped Average Total Cost

Efficient scale

- Average-total-cost curve is U-shaped,
- Note that average total cost is the sum of average fixed cost and average variable cost. Average fixed cost always declines as output rises because the fixed cost is spread over a larger number of units. Average variable cost typically rises as output increases because of diminishing marginal product.
- The tug of war between average fixed cost and average variable cost generates the U-shape in average total cost.
- The **bottom of the U-shape occurs at the quantity of output that minimizes average total cost**

This quantity (bottom of the U-shape) is sometimes called the efficient scale of the firm.

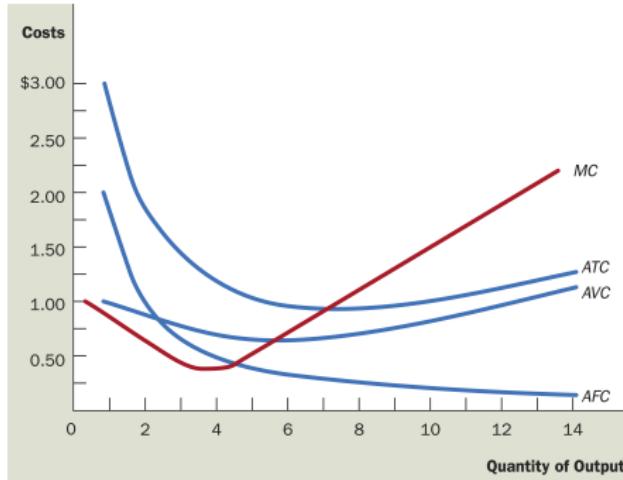
Discussion: The Relationship between Marginal Cost and Average Total Cost

- Whenever marginal cost is less than average total cost, average total cost is falling. Whenever marginal cost is greater than average total cost, average total cost is rising.

This relationship between average total cost and marginal cost has an important corollary:

The marginal-cost curve crosses the average-total-cost curve at its minimum.

Cost Curves in a Typical Firm



Cost Curves for a Typical Firm

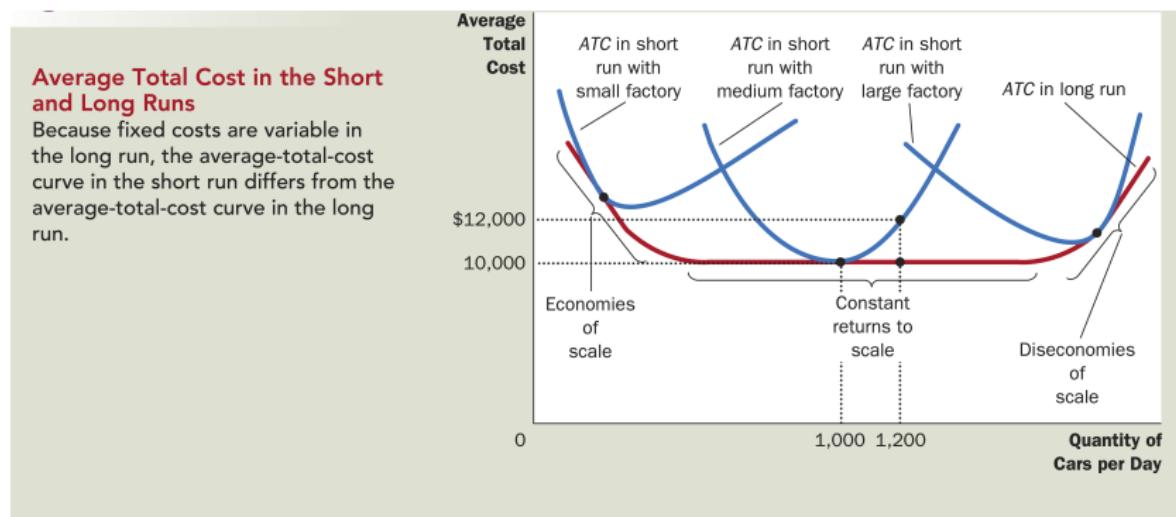
Many firms experience increasing marginal product before diminishing marginal product. As a result, they have cost curves shaped like those in this figure. Notice that marginal cost and average variable cost fall for a while before starting to rise.

- Marginal cost eventually rises with the quantity of output.
- The average-total-cost curve is U-shaped.
- The marginal-cost curve crosses the average-total-cost curve at the minimum of average total cost.

Costs in the Short Run and in the Long Run

The Relationship Between Short-run and Long-run Average Total Cost

Because fixed costs are variable in the long run, the average-total-cost curve in the short run differs from the average-total-cost curve in the long run.



Economies and Diseconomies of Scale

Economies of scale

- the property whereby long-run average total cost falls as the quantity of output increases

Diseconomies of scale

- the property whereby long-run average total cost rises as the quantity of output increases

Constant returns to scale

- the property whereby long-run average total cost stays the same as the quantity of output changes

Economies and Diseconomies of Scale

What might cause economies or diseconomies of scale?

- Economies of scale often arise because higher production levels allow specialization among workers, which permits each worker to become better at a specific task.
- Diseconomies of scale can arise because of coordination problems that are inherent in any large organization.

Session Summary

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This chapter discusses many types of costs: **opportunity cost, total cost, fixed cost, variable cost, average total cost, and marginal cost.**

Fill in the type of cost that best completes each sentence:

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- ⑥ The cost of producing an extra unit of output is the

Fill The Table

Worker	Output	MarginalProduct	TotalCost	ATC	MarginalCost
0	0				
1	20				
2	50				
3	90				
4	120				
5	140				
6	150				
7	155				

- A worker costs \$100 a day, and the firm has fixed costs of \$200.
- Fill in the column for total cost, average total cost, marginal cost.
- Compare marginal product and marginal cost
- Compare average total cost and marginal cost.

THANK YOU