Chapter 1: Ten Principle of Economics 1/11/2013 9:55:00 AM

The word *economy* comes from the Greek work for "one who manages a household"

A household faces many decisions

- It must decide which members of the household do which tasks and what each members gets in return
- The household must allocate its scarce resources among its various members, taking into account each member's abilities, efforts, and desires

Like a household, a society faces many decisions

- A society must decide what jobs will be done and who will do them
- It needs some people to grow food, other people to make clothing, and still others to design computer software
- Once society has allocated people (as well as land, buildings, and machines) to various jobs, it must allocate the output of goods and services that they produce

<u>Economics is about…</u>

- **Scarcity:** the limited nature of society's resources
- The management of society's resources (e.g., people, land, buildings, machinery) is important because resources are scarce
- Natural resource, land and worker's time are all limited in its availability
- **Economics** is about how the society manages its limited resources
- In most societies, resources are allocated not by a single central planner but through the combined actions of millions of households and firms
- Economists study how people make decisions:
    - Firms: what to produce, how much to produce, how many workers to hire, etc.
    - Individuals: what to purchase, how to save, how many hours to work, etc.
- Economists also study how people interact with one another
    - They examine how the multitude of buyers and sellers of a good together determine the price at which the good is sold and the quantity that is sold

- Economist analyze forces and trends that affect the economy as a whole, including the growth in average income, the fraction of population that cannot find work, and the rate at which prices are rising

How People Make Decisions

Principle #1: People Face Tradeoffs

- To get one thing that we like, we usually have to give up another thing that we like
- Making decisions requires trading off one goal against another
- Think of the allocations of your time and money etc.
    - If you buy a new iPhone today, you have to wait before buying a new laptop.
    - If you invest in a stock, you are giving up other forms of investments, such as RESP and bonds.
    - For every hour you spend on studying, you could have worked.
- When people are grouped into societies, they face different kinds of tradeoffs.
- The classic tradeoff is between "guns and butter". The more we spend on national defence (guns) to protect our shores from foreign aggressors, the less we can spend on customer good (butter) to raise our standard of living at home.
- The modern tradeoff is between a clean environment and a high level of income. While pollution regulations give us the benefit of a cleaner environment and the improved health that come with it, they have the cost of reducing the incomes of the firms' owners, workers, and customers.
- Society faces the tradeoff between **efficiency** and **equity**.
- **Efficiency:** the property of society getting the most it can from its scarce resources
- **Equity:** the property of distributing economic prosperity fairly among the members of society
- Efficiency can be referred to the economic pie, and equity to how the economic pie is divided among society's members

Principle #2: The Cost of Something is What You Give Up to Get It

- **Opportunity cost:** whatever must be given up to obtain some item
  - Decision makers should be aware of the opportunity costs that accompany each possible action
  - To become a doctor, you need to go to medical school. In addition, you are giving up other career paths.
  - Waiting in a long line for a free item costs your time.
  - "There is no such thing as a free lunch"

Principle #3: Rational People Think at the Margin

- **Rational people:** people who systematically and purposefully do the best they can to achieve their objectives, given the opportunities they have
- In economics, we usually assume that firms' objective is to maximize its profit and consumers' objective is to achieve the highest level of satisfaction.
- **Marginal changes:** small incremental adjustments to an existing situation or plan of action
  - "marginal" means "edge", so marginal changes are adjustments around the edges of what you are doing
- Rational people make decision by comparing *marginal benefits* and *marginal costs.*
  - Suppose you have already eaten 3 tacos. Whether to have an extra taco depends on price of the taco (marginal cost) and the extra satisfaction it gives (marginal benefit).
  - To study one more hour the night before the exam has benefits and costs (less sleep).
- A rational decision maker takes an action if and only if the marginal benefit of the action exceeds the marginal cost

Principle #4: People Responds to Incentives

- **Incentive:** something, such as a punishment or reward, that induces a person to act
- Rational people respond to incentive
  - "People respond to incentives. The rest is commentary."
  - Incentives are crucial to analyzing how markets work

        - If price of gasoline rises, people drive less.
        - If a neighboring country let people visit without a visa, the number of tourists will increase.
        - If a famous food critic is waiting for a dinner, the chef is trying her/his best.
- Public policymakers should never forget about incentives, because many policies change the cost or benefits that people face and, therefore, alter behaviour
    - When government changes a rule or regulation, it gives an incentive to (some) people to change their action.
- When policymakers fail to consider how their policies affect incentives, they often end up with results they did not intend
    - When the government didn't think thoroughly about all the incentives, unintended consequences can happen.
    - Seat belt law changes how people drive. As result, there were no change in the number of driver deaths.
    - Some say, to decrease the number of concussions in the NFL, you need to stop the use of helmets.

Principle #5: Trade can Make Everyone Better Off

- Trade allows each individual to specialize in the activities she or he does best and to enjoy a greater variety of goods and services. By doing so, everyone will be better off (than being self sufficient).
- Similarly, countries benefit from trade and specialization.

Principle #6: Markets Are Usually a Good Way to Organize Economic Activity

- **Market economy:** an economy that allocates resources through the decentralized decisions of many firms and households as they interact in markets for goods and services
- In a market economy, firms and households make self-interested decisions guided by the market price.
    - Firms decide whom to hire and what to make
    - Households decide which firms to work for and what to buy with their incomes
- Price reveals the buyer's valuation of the good and the seller's cost of producing it.

- Usually, prices adjust to guide the economy to the outcome that maximizes society's economic well-being (resources allocated efficiently).
- In his famous book, Wealth of Nations (1776), Adam Smith wrote: "Every individual…neither intends to promote the public interest, nor knows how much he is promoting…He intends only his own gain, and he is in this, as in many other cases, led by an **invisible hand** to promote an end which was no part of his intention."

Principle #7: Government Can Sometimes Improve Market Outcomes

- We all rely on government-provided police services and courts to enforce our rights over the things we produce-and the invisible hand counts on our ability to enforce our rights
- We need government because the invisible hand is powerful, but is not omnipotent
- **Market failure** refers to a situation in which a market left on its own fails to allocate resources efficiently. It can happen if there is:
    - **Externality:** the impact of one person's actions on the well-being of a bystander. *Example: Pollution*
    - **Market power:** the ability of a single economic actor (or a small group of actors) to have a substantial influence on market prices. *Example: Monopoly*
    - In the presence of externalities or market power, well-designed public policy can enhance economic efficiency
- If there is market failure, government can intervene in the economy and improve the market outcome. In this case, government intervention is *promoting efficiency.*
- Government also can take actions that *promote equity.* Income tax and welfare system are examples of such action.
- One of the most important government role is to enforce **property right** by law.
    - **Property rights:** the ability of an individual to own and exercise control over scarce resources

Principle #8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services

- Living standards vary a lot across countries and over time.
- The main determinant of living standard is **productivity**, the quantity of goods and services produced from each hour of a worker's time.
- In nations where workers can produce a large quantity of goods and services per unit of time, most enjoy a high standard of living; in nations where workers are less productive, most people must endure a more meager existence
    - The growth rate of a nation's productivity determines the growth rate of its average income
- Productivity depends on technology, skills of workers and equipment/machinery.

1. Give three examples of important tradeoffs that face in your life.
2. What is the opportunity cost of a seeing a movie?
3. Water is necessary for life. Is the marginal benefit of a glass of water or small? ….

Chapter 2: Thinking Like an Economist 1/11/2013 9:55:00 AM

The Economist as Scientist

- **Scientific Method:** the dispassionate development and testing of theories on the workings of the universe.
- Since experiment is very difficult to conduct in economics, economists use historical events as natural experiments.
    - Example: decrease in housing sales after interest rate hike.

Assumptions and Economic Models

- **Assumption** is used to simplify complexity of the world.
    - Example: To study consumption behavior, we may assume there are only two goods. Unrealistic, but will give a valuable insight on consumption behavior.
- **Economic model** is an explanation of workings of an economic phenomenon, based on simplifying assumptions.

The Circular-Flow Diagram

- **Circular-Flow Diagram** is a visual model of the economy that shows how dollars flow through markets among households and firms
- There are two types of decision makers.
    - Households: own the factors of production and consume all the goods and services that the firms produce
    - Firms: produce goods and services using inputs (labour, land/natural resources, and capital/buildings and machines)
- There are two markets.
    - *Market for goods and services*
    - *Market for factors of production*
- ***Factors of production*** are the inputs that are necessary for production such as land, labor and capital.
- In the market for goods and services, households are buyers and firms are sellers.
- In the market for factors of production, households are sellers and firms are buyers.
- If you trace a loonie in the economy for period of time, it will be used in transactions in the above two markets repeatedly.
- see figure on slide 6

Production Possibilities Frontier

- **Production Possibilities Frontier (PPF)** is a graph that shows the combinations of outputs that the economy can possibly produce given the available factors of production and the available production technology
- We assume that there are two goods.
- Since the factors of production are limited in quantity, not every combination of goods is feasible.
- See figure + explanation on slide 8

PPF and opportunity cost

- Opportunity cost is what you have to give up in order to obtain something.
- If economy moves from one efficient point to other on PPF, it faces a trade-off. Increasing the production of one good means, we need to decrease the production of the second good.
- The slope of the PPF is opportunity cost of one good in terms of the other.
- See figure + explanation on slide 10

Shape of PPF

- Generally, the shape of PPF is bowed out. But, sometimes, it can be a straight line.
- If the PPF is straight line, then that means the opportunity cost (in terms of other good) of a good is constant regardless of output.
- Bowed out PPF implies opportunity cost of a good increases as economy produces more of it.
- See figure + explanation on slide 12 and 13

PPF and the Economic Growth

- The production possible frontier shows the tradeoff between the outputs of different goods at a given time, but the tradeoff can change over time
- Society can move production from a point on the old frontier to a point on the new frontier

- The production possible frontier simplifies a complex economy to highlight and clarify some basic but powerful ideas
- See figure + explanation on slide 14

The Economists as Policy Advisors

- As a scientists, an economist makes a **positive statement** (descriptive). Positive statement is a description of the world as is
- As a policy advisor, an economist makes a **normative statement** (prescriptive). Its is a statement that expresses the economist's view on how things should be.
- Confirm or refute *positive statements* by examining evidence.
- Evaluating normative statements involves values as well as facts.

Positive and Normative Statements

- Is the following a positive and normative statement?
    - "We should increase the interest rate in order to cool the housing market".
    - **Normative, involves judgment.**
    - "Price decrease of iPhone decreases the number of Galaxy S3 sold."
    - **Positive, describes a relationship.**

Chapter 3: Interdependence and the Gains from Trade

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Interdependence

- Every day you reply on many people from around the world, most of whom you've never met, to provide you with the goods and services you enjoy.
- One of the Ten Principles from Chapter 1: **Trade can make everyone better off.**
- We now learn why people - and nations – choose to be interdependent, and how they can gain from trade.

Example

- Two countries: Canada and Japan
- Two goods: computers and wheat
- One resource: labour, measured in hours
- We will look at how much of both good each country produces and consumes
    - If the country chooses to be self-sufficient
    - If it trades with the other country

Production Possibilities in Canada

- Canada has 50,000 hours of labour available for production, per month
- Producing one computer requires 100 hours of labour
- Producing one ton of wheat requires 10 hours of labour

Canada's PPF: Canada has enough labour to produce 500 computers, or 5000 tons of wheat, or any combination along the PPF

Canada Without Trade: Suppose Canada uses half its labour to produce each of the two goods. Then it will produce and consume 250 computers and 2500 tons of wheat.

Active Learning 1: Derive Japan's PPF

Use the following information to draw Japan's PPF

- Japan has 30,000 hours of labour available for production, per month
- Producing one computer requires 125 hours of labour
- Producing one ton of wheat requires 25 hours of labour

Japan's PPF: Japan has enough labour to produce 240 computers, or 1200 tons of wheat, or any combination along the PPF

Japan Without Trade: Suppose Japan uses half its labour to produce each good. Then it will produce and consume 120 computers and 600 tons of wheat.

Consumption With and Without Trade

- Without trade,
  - Canadian consumers get 250 computers and 2500 tons of wheat
  - Japanese consumers get 120 computers and 600 tons what
- We will compare consumption without trade to consumption with trade
- First, we need to see how much of each good is produced and traded by the two countries

Active Learning 2: Production under trade

1. Suppose Canada produces 3400 tons of wheat. How many computers could Canada be able to produce with its remaining labour? Draw the point representing this combination of computers and wheat on Canada PPF
2. Suppose Japan produces 240 computers. How many tons of wheat would Japan be able to produce with its remaining labour? Draw this point on Japan's PPF

U.S. Production With Trade: Producing 3400 tons of wheat requires 34,000 labour hours. The remaining 16,000 labour hours are used to produce 160 computers.

Japan's Production With Trade: Producing 240 computers requires all of Japan's 30,000 labour hours. So, Japan would produce 0 tons of wheat.

Basic International Trade Terms

- **Exports**: goods and services produced domestically and sold abroad
  - **To export** means to sell domestically produced goods abroad.
- **Imports**: goods and services produced aboard and sold domestically
  - **To import** means to purchase goods produced in other countries.

Active Learning 3: Consumption under trade

Suppose Canada exports 700 tons of wheat to Japan, and imports 110 computers from Japan. (So, Japan imports 700 tons wheat and exports 110 computers.)

- How much of each good is consumed in Canada? Plot this combination on Canada PPF.
- How much of each good is consumed in Japan? Plot this combination on Japan's PPF.
- See slide 18 and slide 20

Trade Makes Both Countries Better Off

see slide 20

Where Do These Gains Come From?

- **Absolute advantage**: the comparison among producers of a good according to their productivity
- Canada has an absolute advantage in wheat: producing a ton of wheat uses 10 labour hours in Canada vs. 25 in Japan
- If each country has an absolute advantage in one good and specializes in that good, then both countries can gain from trade
- Which country has an absolute advantage in computers?
- Producing one computer requires 125 labour hours in Japan, but only 100 in Canada
- Canada has an absolute advantage in <u>both</u> goods!

Two Measures of the Cost of a Good

- Two countries can gain from trade when each specializes in the good it produces at lowest cost
- Absolute advantage measures the cost of a good in terms of the inputs required to produce it
- Recall: another measure of cost is *opportunity cost*
    - **Opportunity cost:** whatever must be given up to obtain some item
- In our example, the opportunity cost of a computer is the amount of wheat that could be produced using the labour needed to produce one computer

Opportunity Cost and Comparative Advantage

- **Comparative advantage**: the comparison among producers of a good according to their opportunity cost
- Which country has the comparative advantage in computers?
- To answer this, must determine the opp. cost of a computer in each country.
- The opp. cost of a computer is
    - 10 tons of wheat in Canada, because producing one computer requires 100 labour hours, which instead could produce 10 tons of wheat
    - 5 tons of wheat in Japan, because producing one computer requires 125 labour hours, which instead could produce 5 tons of wheat
- So, japan has a comparative advantage in computers. *Lesson: Absolute advantage is not necessary for comparative advantage!*

Comparative Advantage and Trade

- Gains from trade arise from comparative advantage (differences in opportunity costs).
- When each country specializes in the good(s) in which it has a comparative advantage, total production in all countries is higher, the world's "economic pie" is bigger, and all countries can gain from trade
- The same applies to individual producers (like the farmer and the rancher) specializing in different goods and trading with each other.
- NOTE: *for both parties, to gain from trade, the price at which they trade must lie between the two opportunity costs*

Active Learning 4: Absolute & comparative advantage

Argentina and Brazil each have 10,000 hours of labour per month.
In Argentina,

- Producing one pound coffee requires 2 hours
- Producing one bottle wine requires 4 hours

In Brazil,

- Producing one pound coffee requires 1 hour
- Producing one bottle wine requires 5 hours

Which country has an absolute advantage in the production of coffee?
Which country has a comparative advantage in the production of wine?

Answers

Brazil has an absolute advantage in coffee:

- Producing a pound of coffee requires only one labour-hour in Brazil, but two in Argentina.

Argentina has a comparative advantage in wine:

- Argentina's opp. cost of wine is two pounds of coffee, because the four labour-hours required to produce a bottle of wine could instead produce two pounds of coffee.
- Brazil's opp. cost of wine is five pounds of coffee.

Active Learning 5: Constructing PPF

Suppose your factory has 3 workers and it produces chairs and tables. A workday has 8 working hours.

- In each hour, Tom can produce 2 chairs or 2 tables.
- In each hour, Jim can produce 4 chairs or 1 table.
- In each hour, John can produce 4 chairs or 2 tables.
- See slide 30
- Who has absolute advantage and who has comparative advantage in chair?
    - Absolute - Jim and John
    - Comparative – Jim
- If everyone makes chair, how many chairs can the factory produce in one day?
    - 80 chairs.
- If everyone makes table, how many tables can the factory produce in one day?
    - 40 tables.
- See slide 32
- Suppose Jim and Tom are making only chairs and John is making only tables. Is this production plan efficient?
- Not efficient. 48 chairs and 16 tables - point E in the graph.

- How do you increase productions of tables and chairs? (We want to find a production plan that produces more than 48 chairs and 16 tables.)
- Make Tom spends only 1.5 hours in table production and John only 1 hour in chair production. (As result, chairs will be produced by Jim (8 hours), Tom (6.5 hours) and John (1hour). Tables will be produced by Tom (1.5 hours) and John (7 hours).)
- See slide 34

Unanswered Questions…

- We made a lot of assumptions about the quantities of each good that each country produces, trades, and consumes, and the price at which the countries trade wheat for computers.
- In the real world, these quantities and prices would be determined by the preferences of consumers and the technology and resources in both countries. (next chapter)
- For now, though our goal was merely to see how *trade can make everyone better off.*

Chapter Summary

- Interdependence and trade allow everyone to enjoy a greater quantity and variety of goods & services.
- Comparative advantage means being able to produce a good at a lower opportunity cost. Absolute advantage means being able to produce a good with fewer inputs.
- When people – or countries – specialize in the goods in which they have a comparative advantage, the economic "pie" grows and trade can make everyone better off.

Chapter 4: The Market Forces of Supply and Demand

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Markets and Competition

- 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
- A **competitive market** is a market in which there are many buyers and many sellers so that each has a negligible impact on the market price
  - Price and quantity are determined by all buyers and sellers as they interact in the marketplace
- In a *perfectly competitive* market:
  - Goods offered for sale are all exactly the same
  - Buyers & sellers are so numerous that no single buyer or seller has any influence over the market price – each is a "**price taker**"
- NOTE: for this chapter, we assume markets are perfectly competitive

Demand

- the **quantity demanded** of any good is the amount of the good that buyers are willing and able to purchase
- **law of demand**: the claim that, other things equal, when the price of a good rises, the quantity demanded of the good falls, and when the price falls, the quantity demanded rises

Demand Schedule

- **Demand schedule**: a table that shows the relationship between the price of a good and the quantity demanded, holding constant everything else that influences how much consumers of the good want to buy
  - Example: see slide 5 + 6 (demand curve)
- **Demand curve**: a graph of the relationship between the price of a good and the quantity demanded

Market Demand vs. Individual Demand

- The quantity demanded in the market is the sum of the quantities demanded by all buyers at each price
- *Market demand:* Sum of all individual demands for a particular good service
- **Q**d = quantity demanded
- see slide 7

The Market Demand Curve

- The market demand curve shows how the total quantity demanded of a good varies as the price of the good varies, while all the other factors that affect how much consumers want to buy are held constant
- see slide 8

Demand Curve Shifters

- The demand curve shows how price affects quantity demanded, *other things being equal*
- These "other things" are non-price determinants of demand (i.e., things that determine buyers' demand for a good, other than the good's price)
- Changes in them shift the **D** curve…
    - *an increase in demand*; any change that increases the quantity demanded at every price, shifts the demand curve to the right
    - *an decrease in demand*; any change that reduces the quantity demanded at every price, shifts the demand curve to the left

Demand Curve Shifters: # of Buyers

- Increase in # of buyers increases quantity demanded at each price, shifts **D** curve to the right
- Suppose the number of buyers increases. Then, at each **P**, **Q**d will increase. (see slide 11)

Demand Curve Shifters: Income

- Demand for a **normal good** is positively related to income

    - A good for which, other things equal, an increase in income leads to an increase in demand, shifts **D** curve to the right
- Demand for an **inferior good** is negatively related to income
    - A good for which, other things equal, an increase in income leads to a decrease in demand, shifts **D** curves to the left
        - **for the inferior good=> income decreases, shift right**
- The impact of changes in wealth on both the amount and composition of goods that individuals consume is called the *wealth effect* (demand curve changes like income)

Demand Curve Shifters: Prices of Related Goods

- Two goods are **substitutes** if an increase in the price of one leads to an increase in demand for the other
    - Example: pizza and hamburgers. An increase in the price of pizza increases demand for hamburgers, shifting hamburger demand curve to the right.
    - Other examples: Coke and Pepsi, laptops and desktop computers, CDs and music downloads
- Two goods are **complements** if an increase in the price of one leads to a decrease in demand for the other
    - Example: computers and software. If price of computer rises, people buy fewer computers, and therefore less software. Software demand curve shifts left.
    - Other examples: college tuition and textbooks, bagels and cream cheese, eggs and bacon

Demand Curve Shifters: Tastes

- Anything that causes a shift in tastes *toward* a good will increase demand for that good and shifts its **D** curve to the right
    - Example: The Atkins diet became popular in the '90s, caused an increase in demand for eggs, shifted the eggs demand curve to the right.

Demand Curve Shifters: Expectations

- Expectations about the future affect consumers' buying decisions

    - Examples: If people expect their incomes to rise, their demand for meals at expensive restaurants may increase now.
    - If the economy sours and people worry about their future job security, demand for new autos may fall now.

Summary: Variable That Influence Buyers

- see table 4.1

Activity Learning 1: Demand Curve

Draw a demand curve for music downloads. What happens to it in each of the following scenarios? Why?

- A. The price of iPods falls
    - Music downloads and iPods are complements. A fall in price of iPods shifts the demand curve for music downloads to the right.
- B. The price of music downloads falls
    - The **D** curve does not shift. Move down along curve to a point with lower **P**, higher **Q**.
- C. The price of CDs falls
    - CDs and music downloads are substitutes. A fall in price of CDs shifts demand for music downloads to the left.

Supply

- The **quantity supplied** of any good is the amount that sellers are willing and able to sell
    - The quantity supplied is *positively related* to the price of the quantity supplied rises as the price rises and falls as the price falls
- **Law of supply**: the claim that, other things equal, the quantity supplied of a good rises when the price of the good rises, and when the price falls, the quantity supplied falls as well

The Supply Schedule

- **Supply schedule**: a table that shows the relationship between the price of a good and the quantity supplied, holding constant

everything else that influences how much producers of the good want to sell
    - Example: see slides 23 + 24
- **Supply curve**: a graph of the relationship between the price of a good and the quantity supplied

Market supply vs. Individual Supply

- The quantity supplied in the market is the sum of the quantities supplied by all sellers at each price
- **Q**s = quantity supplied

The Market Supply Curve

- The market supply curve shows how the total quantity supplied varies as the price of the good varies
- See slide 26

Supply Curve Shifters

- The supply curve shows how price affects quantity supplied, *other things being equal*
- These "other things" are non-price determinants of supply
- Changes in them shift the **S** curve…
    - *an increase in supply*; any change that raises quantity supplied at every price, shifts the supply curve to the right
    - *an decrease in supply*; any change that reduces the quantity supplied at every price, shifts the supply curve to the left

Supply Curve Shifters: Input Prices

- Examples of input prices: wages, prices of raw materials
- A fall in input prices makes production more profitable at each output price, so firms supply a larger quantity at each price, and the **S** curve shifts to the right
- The supply of the good is negatively related to the price of the inputs used to make the good
- See slide 29

Supply Curve Shifters: Technology

- Technology determines how much inputs are required to produce a unit of output
- A cost-saving technological improvement has the same effect as a fall in input prices, shifts **S** curve to the right

Supply Curve Shifters: # of Sellers

- An increase in the number of sellers increases the quantity supplied at each price, shifts **S** curve to the right

Supply Curve Shifters: Expectations

- Example: Events in the Middle East lead to expectations of higher oil prices.
    - In response, owners of Texas oilfields reduce supply now, save some inventory to sell later at the higher price.
    - **S** curve shifts left
- In general, sellers may adjust supply* when their expectations of future price change. (*if good not perishable)

Summary: Variable that Influence Sellers

- See table 4.2

Activity Learning 2: Supply Curve

Draw a supply curve for tax return preparation software. What happens to it in each of the following scenarios?

- A. Retailers cut the price of the software.
    - **S** curve does not shift. Move down along the curve to a lower **P** and lower **Q**.
- B. A technological advance allows the software to be produced at lower cost.
    - **S** curve shifts to the right: at each price, **Q** increases.
- C. Professional tax return prepares raise the price of the services they provide.
    - This shifts the demand curve for tax preparation software, not the supply curve.

Supply and Demand Together

- **Equilibrium**: a situation in which the **price** has reached the level where quantity supplied equals quantity demanded
    - Sometimes called *market clearing price*
- **Equilibrium price**: the price that balances quantity supplied and quantity demanded
- **Equilibrium quantity**: the quantity supplied and the quantity demanded at the equilibrium price
- **Surplus (a.k.a excess supply)**: a situation in which quantity supplied is greater than quantity demanded
    - See slides 41 + 42 + 43
    - Facing a surplus, sellers try to increase sales by cutting price. This causes $\mathbf{Q}^D$ to rise and $\mathbf{Q}^S$ to fall…which reduces surplus. Prices continue to fall until market reaches equilibrium.
- **Shortage (a.k.a excess demand)**: a situation in which quantity demanded is greater than quantity supplied
    - See slides 44 + 45 + 46
    - Facing a shortage, sellers raise the price, causing $\mathbf{Q}^D$ to fall and $\mathbf{Q}^S$ to rise,…which reduces the shortage. Prices continue to rise until market reaches equilibrium
- **Law of supply and demand**: the claim that the price of any good adjusts to bring the quantity supplied and the quantity demanded for that good into balance

<u>Three Steps to Analyzing Changes in Equilibrium</u>

- *Comparative statistics*: the analysis of comparing two unchanging situation – an initial equilibrium and a new equilibrium
- To determine the effects of any event,
  1. decide whether event shifts **S** curve, **D** curve, or both
  2. decide in which direction curve shifts
  3. use supply-demand diagram to see how the shift changes equilibrium **P** and **Q**
    - **NOTE: ON EXAM**
    - EXAMPLE: The Market for Hybrid Cars
        - Example 1: A Shift in Demand (slides 49 + 50)
        - Example 2: A Shift in Supply (slide 52)

        - Example 3: A Shift in Both Supply and Demand (slides 53/54)

Terms for Shift vs. Movement Along Curve **(MUST KNOW THIS FOR EXAM)**

- "supply" refers to the position of the supply curve
- "quantity supplied" refers to the amount suppliers wish to sell
- **Change in supply**: a shift *in* the **S** curve occurs when a non-price determinant of supply changes (like technology or costs)
- **Change in the quantity supplied**: a movement *along* a fixed **S** curve occurs when **P** changes
- **Change in demand**: a shift *in* the **D** curve occurs when a non-price determinant of demand changes (like income or # of buyers)
- **Change in the quantity demand**: a movement *along* a fixed **D** curve occurs when **P** changes

Activity learning 3: Shifts in Supply and Demand

Use the three-step method to analyze the effects of each event on the equilibrium price and quantity of music downloads.

- Event A: A fall in the price of CDs
    - 1. **D** curve shifts
    - 2. **D** shifts left
    - 3. **P** and **Q** both fall.
- Event B: Sellers of music downloads negotiate a reduction in the royalties they must pay for each song they sell.
    - 1. **S** curve shifts
    - 2. **S** shifts right (royalties are part of sellers' cost)
    - 3. **P** falls, **Q** rises.
- Event C: Events A and B both occur.
    - 1. Both curves shift (see parts A & B).
    - 2. **D** shifts left, **S** shifts right.
    - 3. **P** unambiguously falls. (why?) Effects on **Q** is ambiguous: The fall in demand reduces **Q**, the increase in supply increases **Q**.

Conclusion: How Prices Allocate Resources

- One of the Ten Principles from Chapter 1: **Markets are usually a good way to organize economic activity.**
- In market economies, price adjust to balance supply and demand. These equilibrium prices are the signals that guide economic decisions and thereby allocate scarce resources.

Chapter Summary

- SEE TABLE 4.4
- A competitive market has many buyers and sellers, each of whom has little or no influence on the market price.
- Economists use the supply and demand model to analyze competitive markets.
- The downward-sloping demand curve reflects the Law of Demand, which states that the quantity buyers demand of a good depends negatively on the good's price.
- Besides price, demand depends on buyers' incomes, tastes, expectations, the prices of substitutes and complements, and number of buyers. If one of these factors changes, the ***D*** curve shifts.
- The upward-sloping supply curve reflects the Law of Supply, which states that the quantity sellers supply depends positively on the good's price.
- Other determinants of supply include input prices, technology, expectations, and the # of sellers. Changes in these factors shift the ***S*** curve.
- The intersection of ***S*** and ***D*** curves determines the market equilibrium. At the equilibrium price, quantity supplied equals quantity demanded.
- If the market price is above equilibrium, a surplus results, which causes the price to fall. If the market price is below equilibrium, a shortage results, causing the price to rise.
- We can use the supply-demand diagram to analyze the effects of any event on a market: First, determine whether the event shifts one or both curves. Second, determine the direction of the shifts. Third, compare the new equilibrium to the initial one.

- In market economies, prices are the signals that guide economic decisions and allocate scarce resources.

Chapter 5: Elasticity and Its Application 1/11/2013 9:55:00 AM

A scenario…

- You design websites for local businesses.
  You charge $200 per website,
  and currently sell 12 websites per month.
- Your costs are rising
  (including the opportunity cost of your time),
  so you consider raising the price to $250.
- The law of demand says that you won't sell as many websites if you raise your price.
  How many fewer websites? How much will your revenue fall, or might it increase?

Elasticity

- Basic idea
  - Elasticity measures how much one variable responds to changes in another variable.
  - One type of elasticity measures how much demand for your websites will fall if you raise your price.
- **Elasticity** is a numerical measure of the responsiveness of quantity demanded or quantity supplied to one of its determinants

Price Elasticity of Demand

- Price elasticity of demand= Percentage change in $\boldsymbol{Q^d}$
- Percentage change in $\boldsymbol{P}$
- **Price elasticity of demand** is a measure of how much the quantity demanded of a good responds to a change in the price of that good
- 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
- Loosely speaking, it measures the price-sensitivity of buyers' demand
- See slides 6 + 7 for example

Calculating Percentage Changes

- Standard method of computing the percentage (%) change:
  - $\frac{\text{end value – start value}}{\text{start value}} \times 100\%$
- see slide 8 + 9 for example
- *Problem:* the standard method gives different answers depending on where you start
- So, we instead use the **midpoint method**:
  - $\frac{\text{end value – start value}}{\text{midpoint}} \times 100\%$
- The midpoint is the number halfway between the start & end values, the average of those values
- It doesn't matter which value you use as the "start" and which as the "end" – you get the same answer either way!
- See slide 11 for example

Active Learning 1: Calculate an elasticity

- Use the following information to calculate the price elasticity of demand for hotel rooms:
  - if $\boldsymbol{P}$ = \$70, $\boldsymbol{Q^d}$ = 5000
  - if $\boldsymbol{P}$ = \$90, $\boldsymbol{Q^d}$ = 3000
- Answers:
  - Use midpoint method to calculate % change in $\boldsymbol{Q^d}$
    - (5000 – 3000)/4000 = 50%
  - % change in $\boldsymbol{P}$
    - (\$90 – \$70)/\$80 = 25%
  - The price elasticity of demand equals;
    - $\frac{50\%}{25\%} = 2.0$

What determines price elasticity?

- To learn the determinates of price elasticity, we look at a series of examples. Each compares two common goods.
- In each example:
  - Suppose the prices of both goods rise by 20%.

- The good for which Q^d falls the most (in percent) has the highest price elasticity of demand.
  Which good is it? Why?
- What lesson does the example teach us about the determinants of the price elasticity of demand?

EXAMPLE 1: Breakfast Cereal vs. Sunscreen

- The prices of both of these goods rise by 20%.
  For which good does Q^d drop the most? Why?
  - Breakfast cereal has close substitutes (*e.g.*, pancakes, Eggo waffles, leftover pizza), so buyers can easily switch if the price rises.
  - Sunscreen has no close substitutes, so consumers would probably not buy much less if its price rises.
- Lesson: ***Price elasticity is higher when close substitutes are available.***

EXAMPLE 2: "Blue Jeans" vs. "Clothing"

- The prices of both goods rise by 20%.
  For which good does Q^d drop the most? Why?
  - For a narrowly defined good such as blue jeans, there are many substitutes (khakis, shorts, Speedos).
  - There are fewer substitutes available for broadly defined goods.
- Lesson: ***Price elasticity is higher for narrowly defined goods than broadly defined ones.***

EXAMPLE 3: Insulin vs. Caribbean Cruises

- The prices of both of these goods rise by 20%.
  For which good does Q^d drop the most? Why?
  - To millions of diabetics, insulin is a necessity. A rise in its price would cause little or no decrease in demand.
  - A cruise is a luxury. If the price rises, some people will forego it.

- Lesson: ***Price elasticity is higher for luxuries than for necessities.***

EXAMPLE 4: Gasoline in the Short Run vs. Gasoline in the Long Run

- The price of gasoline rises 20%. Does Q^d drop more in the short run or the long run? Why?
  - There's not much people can do in the short run, other than ride the bus or carpool.
  - In the long run, people can buy smaller cars or live closer to where they work.
- Lesson: ***Price elasticity is higher in the long run than the short run.***

<u>The Determinants of Price Elasticity: A Summary</u>

- The price elasticity of demand depends on:
  - the extent to which close substitutes are available
    - goods with close substitutes ten to have more elastic demand because it is easier for consumers to switch from that good to others
  - whether the good is a necessity or a luxury
    - necessities have inelastic demands
    - luxuries have elastic demands
  - how broadly or narrowly the good is defined
    - narrowly defined markets tend to have more elastic demand than broadly defined markets because it is easier to fine close substitutes for narrowly defined goods
  - the time horizon
    - goods tend to have more elastic demand over longer time horizons

<u>The Variety of Demand Curves</u>

- The price elasticity of demand is closely related to the slope of the demand curve.
- Rule of thumb:

    - The flatter the demand curve, the greater the price elasticity of demand
    - The steeper the demand curve, the smaller the price elasticity of demand
- Five different classifications of ***D*** curves….see slides 21-25

Elasticity of a Linear Demand Curve

- The slope of a linear demand curve is constant, but its elasticity is not
    - See slide 26

Price Elasticity and Total Revenue

- **Total revenue** (in a market): the amount paid by buyers and received by sellers of a good, computed as the price of the good times the quantity sold
- Continuing our scenario, if you raise your price from $200 to $250, would your revenue rise or fall?
    - Revenue = ***P*** x ***Q***
- A price increase has two effects on revenue:
    - Higher ***P*** means more revenue on each unit you sell.
    - But fewer units are sold (lower ***Q***), due to Law of Demand.

- Which of these two effects is bigger?
  It depends on the price elasticity of demand.

- Price elasticity of demand= $\frac{\text{Percentage change in } \boldsymbol{Q}}{\text{Percentage change in } \boldsymbol{P}}$
- Revenue = ***P*** x ***Q***

- If demand is elastic, then
    - price elast. of demand > 1
    - % change in ***Q*** > % change in ***P***
- The fall in revenue from lower ***Q*** is greater than the increase in revenue from higher ***P***, so revenue falls (opposite directions)
- See slide 29

- If demand is inelastic, then
  - price elast. of demand < 1
  - % change in ***Q*** < % change in ***P***
- The fall in revenue from lower ***Q*** is smaller than the increase in revenue from higher ***P***, so revenue rises (same direction)

- In our example, suppose that ***Q*** only falls to 10 (instead of 8) when you raise your price to $250.
- See slide 31

Active Learning 2: Elasticity and expenditure/revenue

- A. Pharmacies raise the price of insulin by 10%. Does total expenditure on insulin rise or fall?
- B. As a result of a fare war, the price of a luxury cruise falls 20%. Does luxury cruise companies' total revenue rise or fall?
- Answers
  - A. Pharmacies raise the price of insulin by 10%. Does total expenditure on insulin rise or fall?
  - Expenditure = ***P*** x ***Q***
  - Since demand is inelastic, ***Q*** will fall less than 10%, so expenditure rises.

  - B. As a result of a fare war, the price of a luxury cruise falls 20%. Does luxury cruise companies' total revenue rise or fall?
  - Revenue = ***P*** x ***Q***
  - The fall in ***P*** reduces revenue, but ***Q*** increases, which increases revenue. Which effect is bigger?
  - Since demand is elastic, ***Q*** will increase more than 20%, so revenue rises.

APPLICATION: Does Drug Interdiction Increase or Decrease Drug-Related Crime?

- One side effect of illegal drug use is crime: Users often turn to crime to finance their habit.

- We examine two policies designed to reduce illegal drug use and see what effects they have on drug-related crime.
- For simplicity, we assume the total dollar value of drug-related crime equals total expenditure on drugs.
- Demand for illegal drugs is inelastic, due to addiction issues.
- Policy 1: Interdiction
    - Interdiction reduces the supply of drugs.
    - Since demand for drugs is inelastic, **P** rises proportionally more than **Q** falls.
    - Result: an increase in total spending on drugs, and in drug-related crime
    - See slide 36
- Policy 2: Education
    - Education reduces demand for drugs.
    - **P** and **Q** fall.
    - Result: A decrease in total spending on drugs, and in drug-related crime.
    - See slide 37

Price Elasticity of Supply

- Price elasticity of supply= $\frac{\text{Percentage change in } \mathbf{Q^s}}{\text{Percentage change in } \boldsymbol{P}}$
- **Price elasticity of supply**: a measure of much the quantity supplied of a good responds to a change in the price of that good
- Supply of a good is said to be *elastic* if the quantity supplied responds substantially to changed in the price
- Supply is said to be *inelastic* if the quantity supplied responds only slightly to changes in the price
- Loosely speaking, it measures sellers' price-sensitivity
- Again, use the midpoint method to compute the percentage changes
- See example on slide 39

A Variety of Supply Curves

- The slope of the supply curve is closely related to price elasticity of supply.
- Rule of thumb:
    - The flatter the supply curve, the greater the price elasticity of supply
    - The steeper the supply curve, the smaller the price elasticity of supply
- Five different classifications….see slides 41-45

The Determinants of Supply Elasticity

- The more easily sellers can change the quantity they produce, the greater the price elasticity of supply.
    - Example: Supply of beachfront property is harder to vary and thus less elastic than supply of new cars.
- For many goods, price elasticity of supply is greater in the long run than in the short run, because firms can build new factories, or new firms may be able to enter the market

Active Learning 3: Elasticity and changes in equilibrium

- The supply of beachfront property is inelastic. The supply of new cars is elastic.
- Suppose population growth causes demand for both goods to double (at each price, $\boldsymbol{Q^d}$ doubles).
- For which product will ***P*** change the most?
- For which product will ***Q*** change the most?
- Answers
    - When supply is *inelastic,* an increase in demand has a bigger impact on price than on quantity (beachfront property)
    - See slide 48
    - When supply is *elastic*, an increase in demand has a bigger impact on quantity than on price (new cars)
    - See slide 49

How the Price Elasticity of Supply Can Vary

- Supply often becomes less elastic as quantity rises, due to capacity limits
- See slide 50

Other Elasticities

- **Income elasticity of demand**: a measure of how much the quantity demanded of a good responds to a change in consumers' income
- Income elasticity of demand = $\frac{\text{Percent change in } Q^d}{\text{Percent change in income}}$
- **Recall from Chapter 4: An increase in income causes an increase in demand for a *normal* good.**
- Hence, for *normal* goods, income elasticity > 0
  - Higher income raises the quantity demanded (same direction)
- For *inferior* goods, income elasticity < 0
  - Higher income lowers the quantity demanded (opposite direction)
- **Cross-price elasticity of demand**: a measure of how much the quantity demanded of one good responds to a change in the price of another good
- Cross-price elast. of demand = $\frac{\%\text{ change in } Q^d \text{ for good 1}}{\%\text{ change in price for good 2}}$
- For substitutes, cross-price elasticity > 0
  - (e.*g*., an increase in price of beef causes an increase in demand for chicken)
- For complements, cross-price elasticity < 0
  - (*e.g*., an increase in price of computers causes decrease in demand for software)
- NOTE: whether the cross-price elasticity is a positive or negative number depends on whether the two goods are substitutes or complements

Cross-Price Elasticities in the News

- "As Gas Costs Soar, Buyers Flock to Small Cars"
  -*New York Times*, 5/2/2008

- "Gas Prices Drive Students to Online Courses"
  -*Chronicle of Higher Education*, 7/8/2008
- "Camel demand soars in India"
  (as a substitute for "gas-guzzling tractors")
  -*Financial Times*, 5/2/2008
- "High gas prices drive farmer to switch to mules"
  -*Associated Press*, 5/21/2008

Chapter Summary

- Elasticity measures the responsiveness of $\boldsymbol{Q}^{\mathbf{d}}$ or $\boldsymbol{Q}^{\mathbf{s}}$ to one of its determinants.
- Price elasticity of demand equals percentage change in $\boldsymbol{Q}^{\mathbf{d}}$ divided by percentage change in $\boldsymbol{P}$. When it's less than one, demand is "inelastic." When greater than one, demand is "elastic."
- When demand is inelastic, total revenue rises when price rises. When demand is elastic, total revenue falls when price rises.
- Demand is less elastic in the short run,
  for necessities, for broadly defined goods,
  or for goods with few close substitutes.
- Price elasticity of supply equals percentage change in $\boldsymbol{Q}^{\mathbf{s}}$ divided by percentage change in $\boldsymbol{P}$.
  When it's less than one, supply is "inelastic." When greater than one, supply is "elastic."
- Price elasticity of supply is greater in the long run than in the short run.
- The income elasticity of demand measures how much quantity demanded responds to changes in buyers' incomes.
- The cross-price elasticity of demand measures how much demand for one good responds to changes in the price of another good.

Chapter 6: Supply, Demand, and Government Policies

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Government Policies That Alter the Private Market Outcome

- Price controls
  - **Price ceiling**: a legal maximum on the price at which a good or service can be sold
    - *Example: rent control*
  - **Price floor**: a legal minimum on the price at which a good or service can be sold
    - *Example: minimum wage*
- Taxes
  - The government can make buyers or sellers pay a specific amount on each unit bought/sold.
  - Use the supply/demand model to see how each policy affects the market outcome (the price buyers pay, the price sellers receive, and equilibrium quantity).
  - see slide 4 for example

How Price Ceilings Affect Market Outcomes

- A price ceiling above the equilibrium price is **not binding** – has no effect on the market outcome
  - see slide 5
- The ceiling is a **binding constraint** on the price, causes a shortage
  - The forces of supply and demand tend to move the price toward the equilibrium price, but when the market price hits the ceiling, it cannot rise; price equals price ceiling
  - see slide 6
- In the long run, supply and demand are more price-elastic. So, the shortage is longer
  - see slide 7

Shortages and Rationing

- With a shortage, sellers must ration the goods among buyers
- Some rationing mechanisms:
  (1) Long lines
  (2) Discrimination according to sellers' biases

- These mechanisms are often unfair, and inefficient: the goods do not necessarily go to the buyers who value them most highly
- In contrast, when prices are not controlled, the rationing mechanism is efficient (the goods go to the buyers that value them most highly) and impersonal (and thus fair).
    - see slide 9 for example

How Price Floors Affect Market Outcomes

- A price floor below the equilibrium price is **not binding** – has no effect on the market outcome.
    - see slide 10
- The floor is a **binding constraint** on the wage, causes a surplus (*i.e.,* unemployment).
    - see slide 11

The Minimum Wage

- Min wage laws do not affect highly skilled workers
- They do affect teen workers
- Studies: A 10% increase in the min wage raises teen unemployment by 1-3%.

Active Learning 1: Price controls

- see slides 13-16

Evaluating Price Controls

- Recall one of the Ten Principles from Chapter 1: ***Markets are usually a good way to organize economic activity.***
- Prices are the signals that guide the allocation of society's resources
    - This allocation is altered when policymakers restrict prices
- Price controls often intended to help the poor, but often hurt more than help

Taxes

- The government levies taxes on many goods & services to raise revenue to pay for national defense, public schools, etc.

- The government can make buyers or sellers pay the tax
- The tax can be a % of the good's price, or a specific amount for each unit sold.
    - For simplicity, we analyze per-unit taxes only
- see slide 19 for example

A Tax on Buyers

- see slide 20-22
- Hence, a tax on buyers shifts the ***D*** curve down by the amount of the tax
- The **incidence** of a tax: the manner in which the burden of a tax is shared among participants in the market
- Summary
    - Taxes discourage market activity. When a good is taxed, the quantity of the good sold is smaller in the new equilibrium
    - Buyers and sellers share the burden on taxes. In the new equilibrium, buyers pay more for the good, and sellers receive less

A Tax on Sellers

- see slide 23-25
- Hence, a tax on sellers shifts the ***S*** curve up by the amount of the tax
- Summary
    - Taxes on buyers and taxes on sellers are equivalent

Active Learning 2: Effects of a tax

- see slide 26-27

Elasticity and Tax Incidence

- CASE 1: Supply is more elastic than demand
    - It's easier for sellers than buyers to leave the market
    - So buyers bear most of the burden of the tax
    - see slide 28
- CASE 2: Demand is more elastic than supply
    - It's easier for buyers than sellers to leave the market

- Sellers bear most of the burden of the tax
- see slide 28

CONCLUSION: Government Policies and the Allocation of Resources

- Each of the policies in this chapter affects the allocation of society's resources.
  - *Example 1:* A tax on pizza reduces eq'm ***Q***.
  - With less production of pizza, resources (workers, ovens, cheese) will become available to other industries.
  - *Example 2:* A binding minimum wage causes a surplus of workers, a waste of resources.
- So, it's important for policy makers to apply such policies very carefully.

CHAPTER SUMMARY

- A price ceiling is a legal maximum on the price of a good. An example is rent control. If the price ceiling is below the equilibrium price, it is binding and causes a shortage.
- A price floor is a legal minimum on the price of a good. An example is the minimum wage. If the price floor is above the equilibrium price, it is binding and causes a surplus. The labour surplus caused by the minimum wage is unemployment.
- A tax on a good places a wedge between the price buyers pay and the price sellers receive, and causes the equilibrium quantity to fall, whether the tax is imposed on buyers or sellers.
- The incidence of a tax is the division of the burden of the tax between buyers and sellers, and does not depend on whether the tax is imposed on buyers or sellers.
- The incidence of the tax depends on the price elasticities of supply and demand.