Supply

- Supply refers to the quantity of a commodity that producers are willing to produce and sell at a given price per unit of time. The word 'supply' has the following features.
- The supply of a commodity is stated in quantitative terms as the desired quantities.
- Formally, supply of a commodity refers to the quantity that a producer is willing to sell at different prices.

Supply in Product/Output Markets

- Firms build factories, hire workers, and buy raw materials because they believe they can sell the products they make for more than it costs to produce them.
- **profit** The difference between revenues and costs.

Price and Quantity Supplied: The Law of Supply

- **quantity supplied** The amount of a particular product that a firm would be willing and able to offer for sale at a particular price during a given time period.
- **supply schedule** Shows how much of a product firms will sell at alternative prices.

Price and Quantity Supplied: The Law of Supply

- **law of supply** The positive relationship between price and quantity of a good supplied: An increase in market price, *ceteris paribus*, will lead to an increase in quantity supplied, and a decrease in market price will lead to a decrease in quantity supplied.
- **supply curve** A graph illustrating how much of a product a firm will sell at different prices.

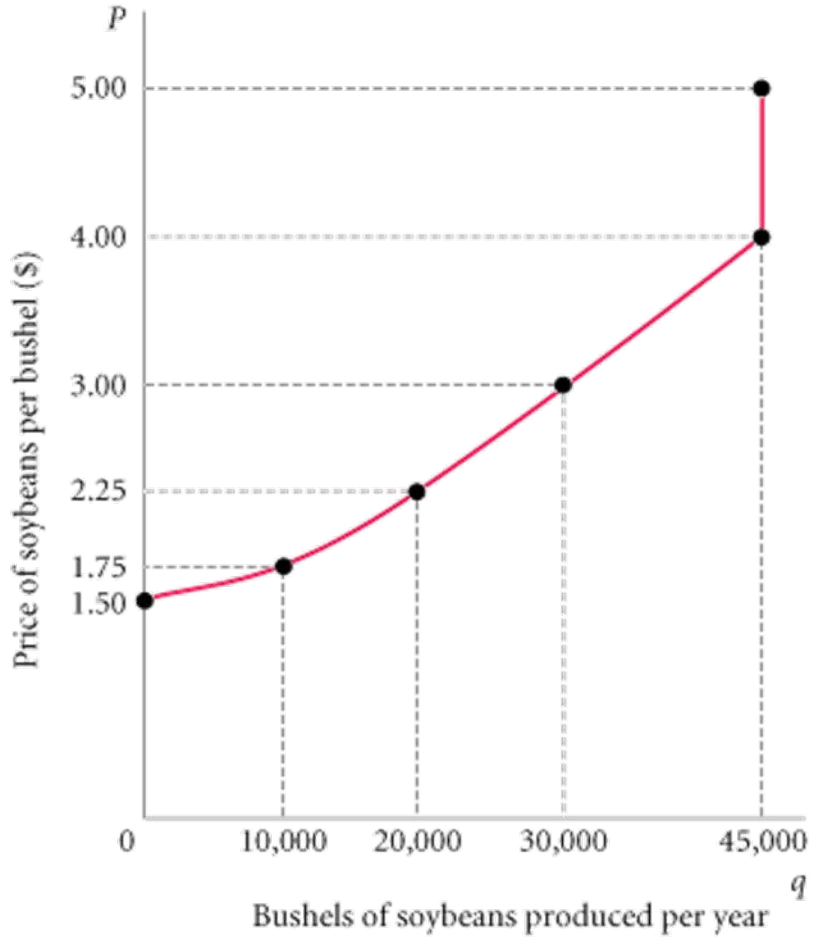
TABLE 3.3 Clarence Brown's Supply Schedule for Soybeans

Price (per Bushel)	Quantity Supplied (Bushels per Year)
$1.50	0
1.75	10,000
2.25	20,000
3.00	30,000
4.00	45,000
5.00	45,000

A producer will supply more when the price of output is higher. The slope of a supply curve is positive.

Note that the supply curve is red: Supply is determined by choices made by firms.

FIGURE 3.6 Clarence Brown's Individual Supply Curve



Determinants of Supply

- Price
- The Cost of Production
- The Prices of Related Products
- Technology
- Expectation
- Natural Factors
- Price of Input Factors
- Goal of Firm

Prices of Other Goods and Services

- **substitutes** Goods that can serve as replacements for one another. An increase in the price of one substitute good causes a decrease in the supply of the other.
- **complements, complementary goods** Goods that "go together"; a increase in the price of good y, increase in supply of good x and vice versa.

Shift of Supply versus Movement along a Supply Curve

- **movement along a supply curve** The change in quantity supplied brought about by a change in price.

- **shift of a supply curve** The change that takes place in a supply curve corresponding to a new relationship between quantity supplied of a good and the price of that good. The shift is brought about by a change in the original conditions.

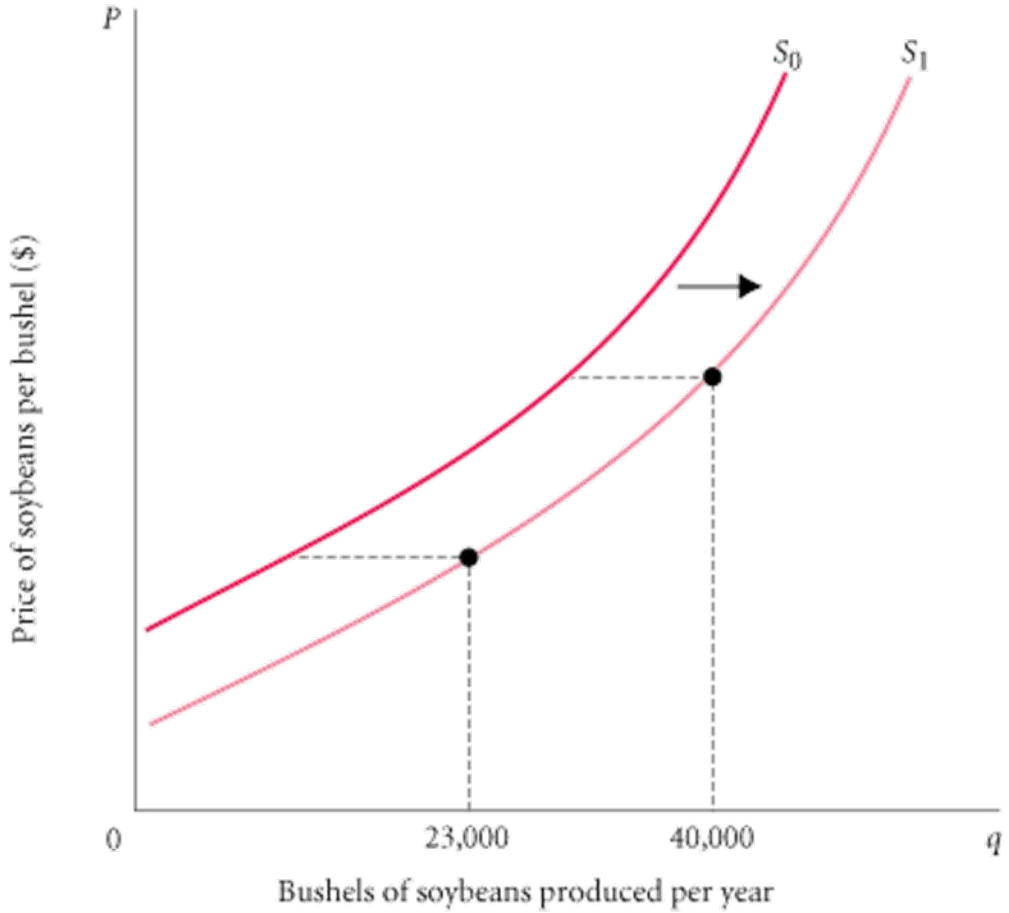
TABLE 3.4 Shift of Supply Schedule for Soybeans following Development of a New Disease-Resistant Seed Strain

Price (per Bushel)	Schedule S_0 Quantity Supplied (Bushels per Year Using Old Seed)	Schedule S_1 Quantity Supplied (Bushels per Year Using New Seed)
$1.50	0	5,000
1.75	10,000	23,000
2.25	20,000	33,000
3.00	30,000	40,000
4.00	45,000	54,000
5.00	45,000	54,000

FIGURE 3.7 Shift of the Supply Curve for Soybeans Following Development of a New Seed Strain

When the price of a product changes, we move *along* the supply curve for that product; the quantity supplied rises or falls.

When any other factor affecting supply changes, the supply curve *shifts*.



Shift of Supply versus Movement along a Supply Curve

- It is very important to distinguish between movements along supply curves (changes in quantity supplied) and shifts in supply curves (changes in supply):
- Change in price of a good or service leads to

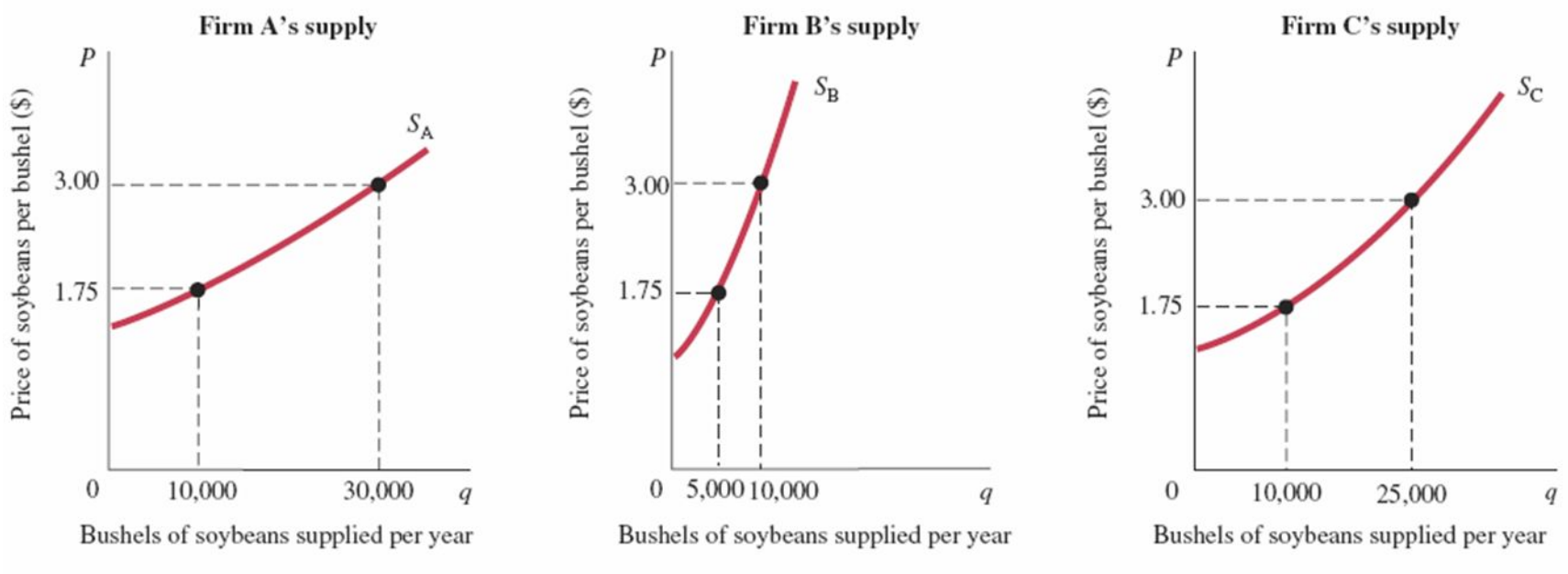
  change in *quantity supplied* (**movement along a supply curve**).
- Change in costs, input prices, technology, or prices of related goods and services leads to

  change in *supply* (**shift of a supply curve**).

Why Supply Curve Shifts?

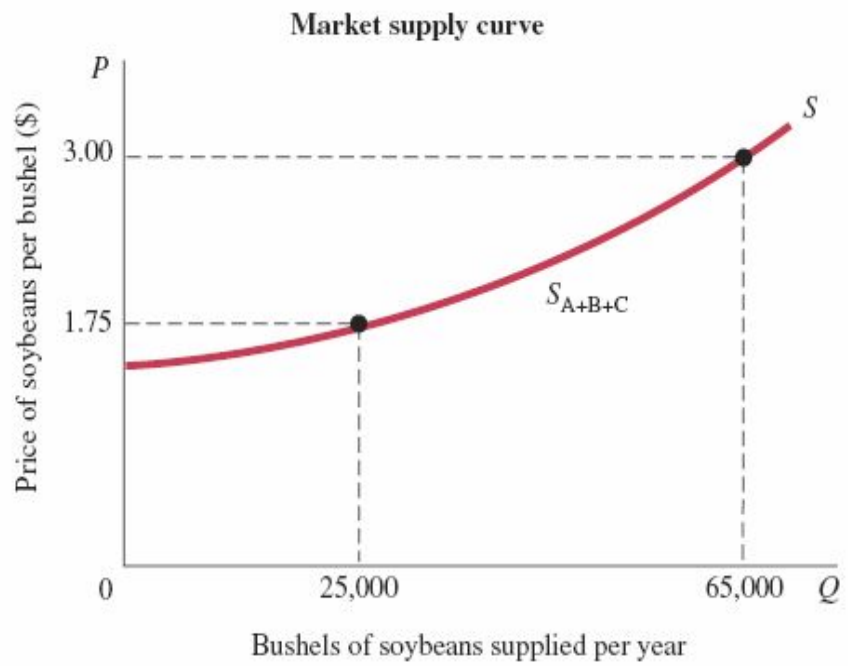
- Change in the prices of other commodities
- Change in the prices of factors of production
- Change in technology:

FIGURE 3.8 Deriving Market Supply from Individual Firm Supply Curves



Total supply in the marketplace is the sum of all the amounts supplied by all the firms selling in the market. It is the sum of all the individual quantities supplied at each price.

FIGURE 3.8 Deriving Market Supply from Individual Firm Supply Curves (cont'd)



Price	Quantity (q) Supplied by A	B	C	Total Quantity Supplied in the Market (Q)
$3.00	30,000 +	10,000 +	25,000	= 65,000
1.75	10,000 +	5,000 +	10,000	= 25,000

Total supply in the marketplace is the sum of all the amounts supplied by all the firms selling in the market. It is the sum of all the individual quantities supplied at each price.

Supply Function

- The supply function is a shorthand expression of the various factors affecting supply of a commodity.
- Thus, the supply of a commodity can be put as a function of price of that commodity, the price of all other commodities; the prices of factors of production, technology, the objectives of producers and other factors.
- This relationship must be expressed with the help of following symbols.
- QS = f(P 1 , P 2 , P3 .... Pn , F1 ... Fn T, O, OF where QS stands for the supply of commodity ……P 1 is the price of that commodity, P 2 , P3 ...Pn are the prices of all other commodities, F1……Fn are the prices of all factors of production.
- T is the state of technology, O is the objective of the producer and OF stands for other factors influencing supply.

Supply Schedule of a Pen Producer

Price(in Rs) Per Pen	Quantity Supplied (In thousand) Per Month
2	25
3	40
4	50
5	60
6	70

The schedule presented in Table shows that at a price of Rs 2 per pen the producer is willing to supply 25 thousand pens per month.

And at a higher price of Rs 3 per pen he is willing to supply 40 thousand pens per month and as price of pens keep rising he is willing to supply more and more quantity of pens per month as shown in the supply schedule.

This supply schedule has been so drawn as to depict a direct relationship between price per pen and quantity supplied of pens per month.

Supply Curve

- A supply curve is a graphical illustration of the correlation between the quantity of an item or service in supply and the price of the good or service over a given period. The supply curve is represented graphically with the price on the vertical axis and the number of items on the horizontal axis.

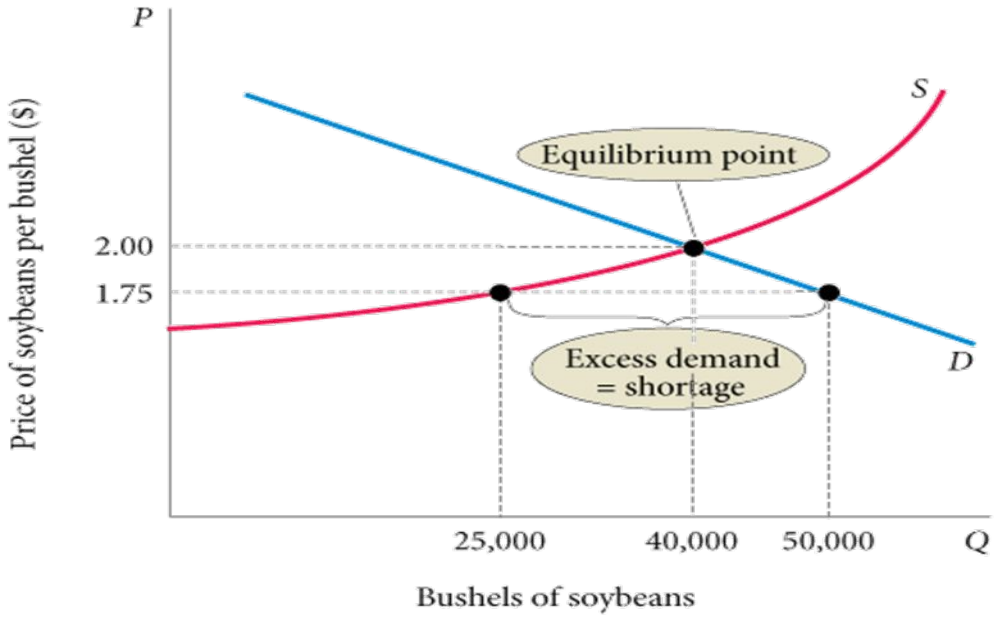
Market Equlibrium

- **Equilibrium** The condition that exists when quantity supplied and quantity demanded are equal. At equilibrium, there is no tendency for price to change.

Excess Demand

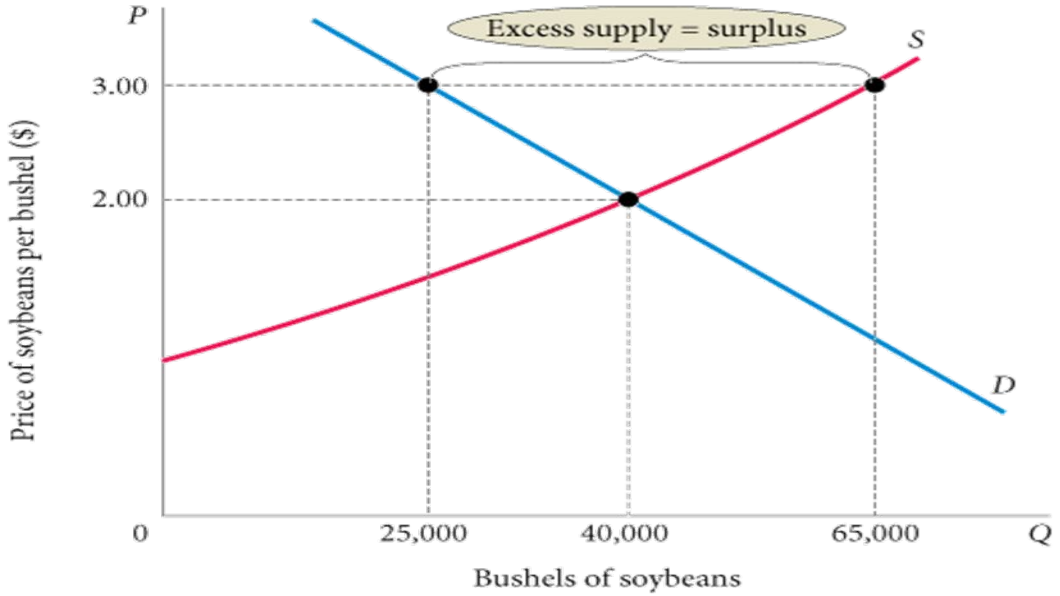
- **excess demand or shortage** The condition that exists when quantity demanded exceeds quantity supplied at the current price.

Excess Demand, or Shortage



- At a price of $1.75 per bushel, quantity demanded exceeds quantity supplied.
- When *excess demand* exists, there is a tendency for price to rise.
- When quantity demanded equals quantity supplied, excess demand is eliminated and the market is in equilibrium.
- Here the equilibrium price is $2.00, and the equilibrium quantity is 40,000 bushels.
- Here the equilibrium price is $2.00, and the equilibrium quantity is 40,000 bushels.

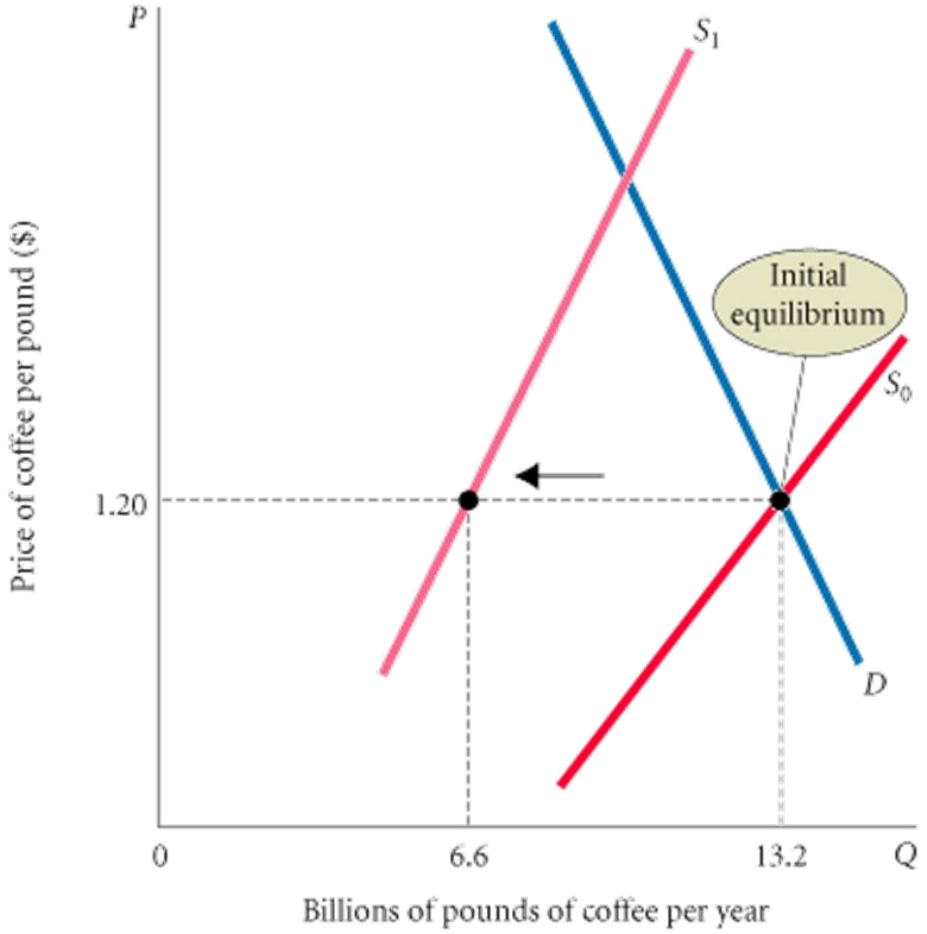
Excess Supply, or Surplus



At a price of $3.00, quantity supplied exceeds quantity demanded by 40,000 bushels.
This excess supply will cause the price to fall.

The Coffee Market: A Shift of Supply and Subsequent Price Adjustment

- Before the freeze, the coffee market was in equilibrium at a price of $1.20 per pound.
- At that price, quantity demanded equaled quantity supplied.
- The freeze shifted the supply curve to the left (from S_0 to S_1), increasing the equilibrium price to $2.40.



Example

- Let the demand and supply function for good x as follows:

$Qd=80-40p$

$Qs = -10+20p$

Find equilibrium level of Price, Quantity demand and quantity supply respectively.

Household Choice in Output Markets

- Every household must make three basic decisions:

1. How much of each product, or output, to demand
2. How much labor to supply
3. How much to spend today and how much to save for the future

The Budget Constraint

- **Budget constraint** The limits imposed on household choices by income, wealth, and product prices.
- **Choice set** or **Opportunity set** The set of options that is defined and limited by a budget constraint.

TABLE 6.1 Possible Budget Choices of a Person Earning $1,000 per Month after Taxes

Option	Monthly Rent	Food	Other Expenses	Total	Available?
A	$ 400	$250	$350	$1,000	Yes
B	600	200	200	1,000	Yes
C	700	150	150	1,000	Yes
D	1,000	100	100	1,200	No

The Budget Constraint

Preferences, Tastes, Trade-offs, and Opportunity Cost

- Within the constraints imposed by limited incomes and fixed prices, households are free to choose what they will and will not buy.

- A household makes a choice by ranking the good or service that it chooses against all the other things that the same money could buy.

- With a limited budget, the real cost of any good or service is the value of the other goods and services that could have been purchased with the same amount of money.

Household Behavior and Consumer choice

Budget constraint and its role

The budget constraint shows the various bundles of goods that the consumer can buy for a given income. Here the consumer buys bundles of pizza and Pepsi. The table and graph show what the consumer can afford if her income is $1,000, the price of pizza is $10, and the price of Pepsi is $2.

Number of Pizzas	Liters of Pepsi	Spending on Pizza	Spending on Pepsi	Total Spending
100	0	$1,000	$ 0	$1,000
90	50	900	100	1,000
80	100	800	200	1,000
70	150	700	300	1,000
60	200	600	400	1,000
50	250	500	500	1,000
40	300	400	600	1,000
30	350	300	700	1,000
20	400	200	800	1,000
10	450	100	900	1,000
0	500	0	1,000	1,000

The Consumer's Budget Constraint

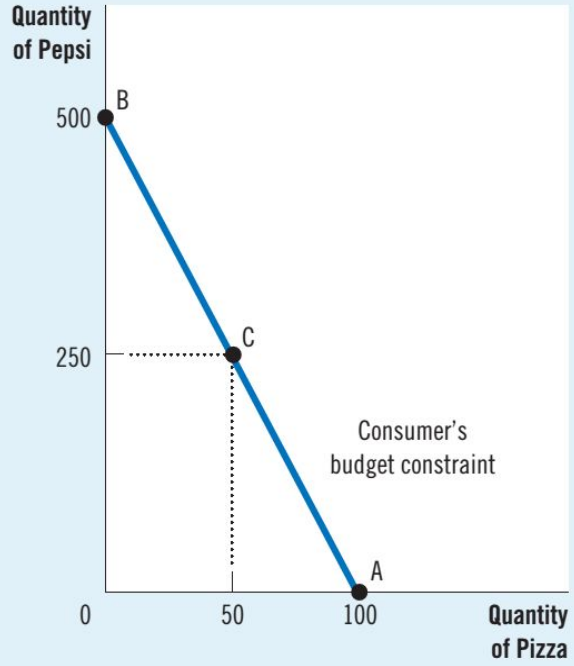
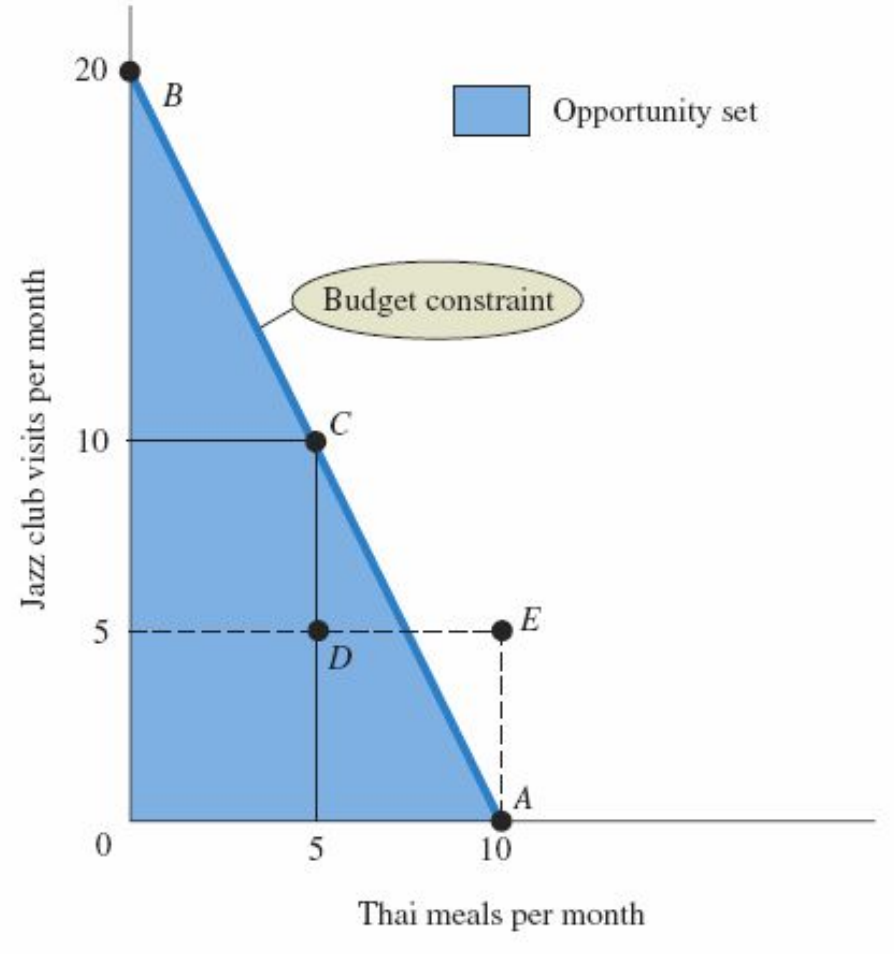


FIGURE 6.1 Budget Constraint and Opportunity Set for Ann and Tom

A budget constraint separates those combinations of goods and services (e.g., point *C*) that are available, given limited income, from those that are not (e.g., point *E*).

The available combinations make up the opportunity set.



The Budget Constraint

The Budget Constraint More Formally

- Both prices and income affect the size of a household's opportunity set.
- **Real income** The set of opportunities to purchase real goods and services available to a household as determined by prices and money income.

The Equation of the Budget Constraint

- In general, the budget constraint can be written:

$$P_X X + P_Y Y = I,$$

where:

P_X = the price of X
X = the quantity of X consumed
P_Y = the price of Y
Y = the quantity of Y consumed
I = household income

Example

- Amar has ₹ 500 a week to spend on clothing and food. The price of clothing is ₹ 25 and the price of food is ₹ 10. The clothing and food pairs in Amar's choice set include _____ units of clothing and _____ units of food.

A) 50; 50

B) 20; 50

C) 15; 25

D) 8; 30

Example

- Abhay has $500 a week to spend on clothing (c) and food (f). The price of clothing is $25 and the price of food is $10. What is the equation for Abhay's budget constraint?
- A) ($25 × Clothing) × ($10 × Food) < $500
- B) $25 × Clothing + $10 × Food ≥ $500
- C) ($25 × Clothing) / ($10 × Food) = $500
- D) $25 × Clothing + $10 × Food = $500

Example

- A consumer can consume books or soap. The price of the book is Rs.5 per book, and the price of soap is Rs10 per soap. Find and draw the budget constraint if the consumer’s total income is Rs. 100.

The Budget Constraint

- Rotation
- Shift

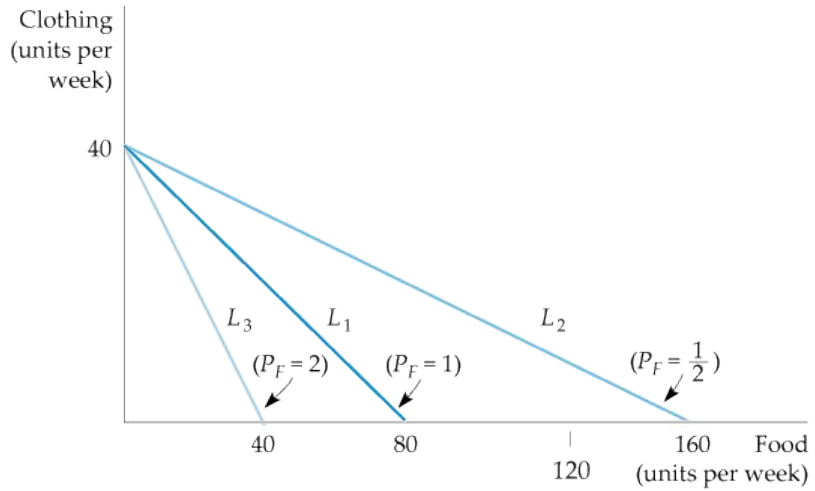
EFFECTS OF A CHANGE IN PRICE ON THE BUDGET LINE

PRICE CHANGES

A change in the price of one good (with income unchanged) causes the budget line to rotate about one intercept.

When the price of food falls from \$1.00 to \$0.50, the budget line rotates outward from L_1 to L_2.

However, when the price increases from \$1.00 to \$2.00, the line rotates inward from L_1 to L_3.



The Effects of Changes in Income and Prices

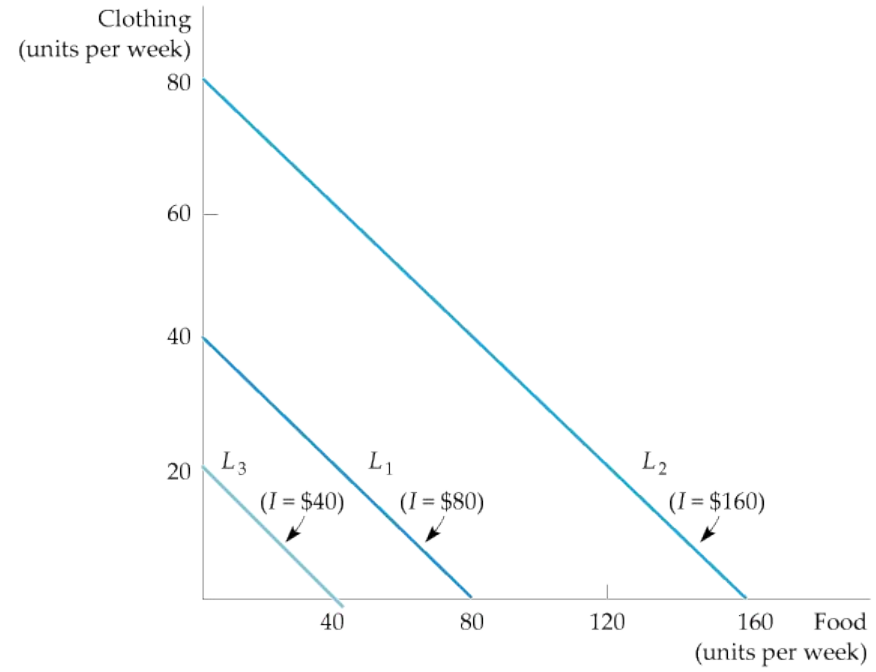
EFFECTS OF A CHANGE IN INCOME ON THE BUDGET LINE

INCOME CHANGES

A change in income (with prices unchanged) causes the budget line to shift parallel to the original line (L_1).

When the income of \$80 (on L_1) is increased to \$160, the budget line shifts outward to L_2.

If the income falls to \$40, the line shifts inward to L_3.



The Basis of Choice: Utility

- **Utility** The satisfaction a product yields

- **Total utility** The total satisfaction a product yields.

- **Marginal utility (*MU*)** The additional satisfaction gained by the consumption of *one more* unit of a good or service.

Diminishing Marginal Utility

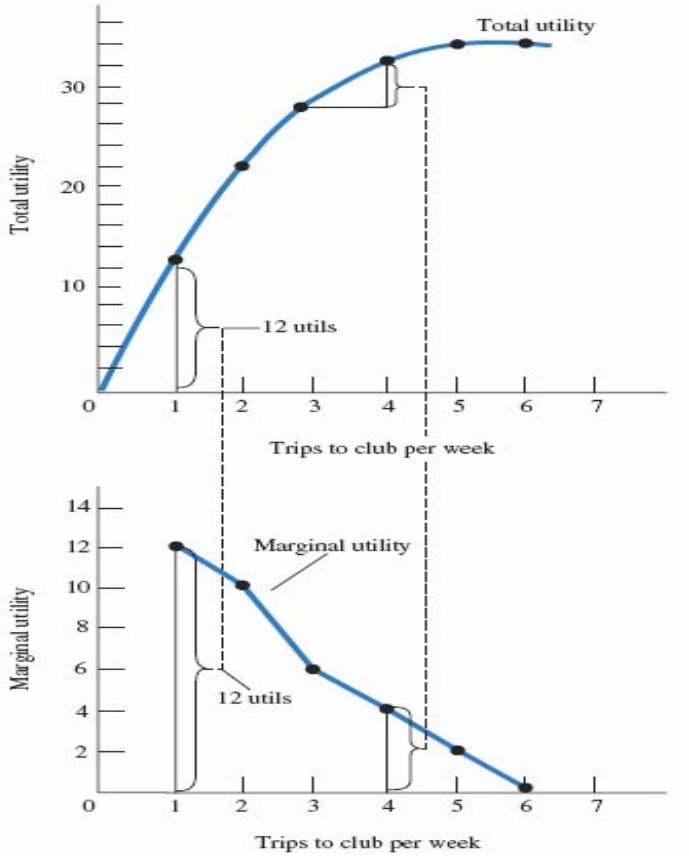
- **law of diminishing marginal utility** The more of any one good consumed in a given period, the less satisfaction (utility) generated by consuming each additional (marginal) unit of the same good.

Total Utility and Marginal Utility of Trips to the Club per Week

Trips to Club	Total Utility	Marginal Utility
1	12	12
2	22	10
3	28	6
4	32	4
5	34	2
6	34	0

- Marginal utility is the additional utility gained by consuming one additional unit of a commodity—in this case, trips to the club.
- When marginal utility is zero, total utility stops rising.

FIGURE 6.3 Graphs of Frank's Total and Marginal Utility



Allocating Income to Maximize Utility

TABLE 6.3 Allocation of Fixed Expenditure per Week between Two Alternatives

(1) Trips to Club per Week	(2) Total Utility	(3) Marginal Utility (*MU*)	(4) Price (*P*)	(5) Marginal Utility per Dollar (*MU/P*)
1	12	12	$3.00	4.0
2	22	10	3.00	3.3
3	28	6	3.00	2.0
4	32	4	3.00	1.3
5	34	2	3.00	0.7
6	34	0	3.00	0

(1) Basketball Games per Week	(2) Total Utility	(3) Marginal Utility (*MU*)	(4) Price (*P*)	(5) Marginal Utility per Dollar (*MU/P*)
1	21	21	$6.00	3.5
2	33	12	6.00	2.0
3	42	9	6.00	1.5
4	48	6	6.00	1.0
5	51	3	6.00	0.5
6	51	0	6.00	0

Income ($21) and prices ($3 and $6) define Frank's budget constraint

The Utility-Maximizing Rule

- Utility-maximizing consumers spread out their expenditures until the following condition holds:

$$\text{Utility} - \text{Maximizing rule}: \frac{MU_X}{P_X} = \frac{MU_Y}{P_Y} \text{ for all goods,}$$

where MU_X is the marginal utility derived from the last unit of X consumed, MU_Y is the marginal utility derived from the last unit of Y consumed, P_X is the price per unit of X, and P_Y is the price per unit of Y.

The Utility-Maximizing Rule

- **Utility-maximizing rule** Equating the ratio of the marginal utility of a good to its price for all goods.

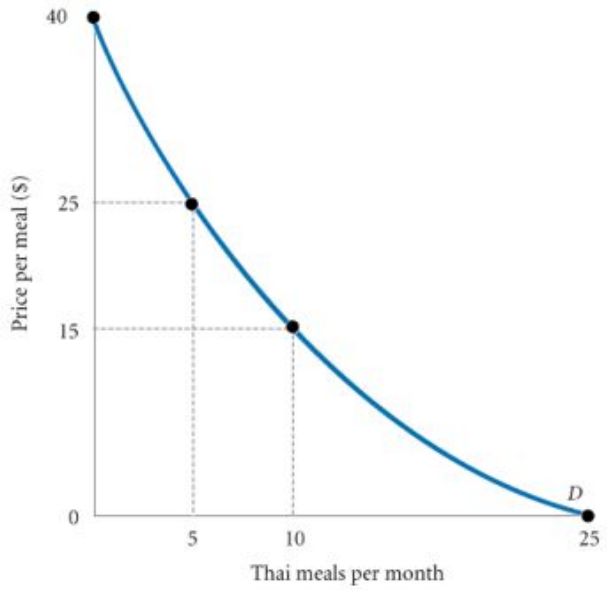
- **Diamond/water paradox**

- One of the most disconcerting problems to Adam_Smith, the father of modern economics, was he could not resolve the issue of valuation in human preferences. He described this problem in *The Wealth of Nations* by comparing the high value of a diamond, which is unessential to human life, to the low value of water, without which humans would die. He determined "value in use" was irrationally separated from "value in exchange

- A paradox stating that (1) the things with the greatest value in use frequently have little or no value in exchange and (2) the things with the greatest value in exchange frequently have little or no value in use.

Diminishing Marginal Utility and Downward-Sloping Demand

FIGURE 6.4 Diminishing Marginal Utility and Downward-Sloping Demand



At a price of $40, the utility gained from even the first Thai meal is not worth the price.

However, a lower price of $25 lures Ann and Tom into the Thai restaurant 5 times a month. (The utility from the sixth meal is not worth $25.)

If the price is $15, Ann and Tom will eat Thai meals 10 times a month—until the marginal utility of a Thai meal drops below the utility they could gain from spending $15 on other goods.

At 25 meals a month, they cannot tolerate the thought of another Thai meal, even if it is free.