CHAPTER 1

Microeconomics: deals with the behavior of individual economic units (consumers, workers, investors, owners of land, business firms). Explains how and why these units make economic decisions

- Is about limits (limited income, budgets, etc)
- Ways to make most of these limits; allocation of scarce resources

Themes of microeconomics

1. **Trade-offs:** that consumers, workers and firms face and how these trade-offs are best made
    a. Consumers: have limited incomes that can be spent on wide variety of goods and services
        i. *Consumer theory:* describes how consumers, based on preferences, maximize their well-being by trading off the purchase of more of some goods for the purchase of less of others
    b. Workers: face constraints and trade-offs too: 1) deciding whether and when to enter workforce & 2) choice of employment
    c. Firms: trade-offs in terms of the kinds of products that they can produce and resources available to produce them
2. **Prices and markets:** role of prices
3. **Theories and models:** concerned with explanation of observed phenomena
4. **Positive vs. normative analysis:**
    a. Positive: statements that describe relationships of cause and effect
    b. Normative: analysis examining questions of what **ought** to be. Often supplemented by value judgements

Macroeconomics: aggregate economic quantities, such as level and growth rate of national output, interest rates, unemployment and inflation. Involves the analysis of markets

Market: the collection of buyers and sellers that, through their actual or potential interactions, determine the price of a product or set of products

- Market definition: determination of the buyers, sellers and range of products that should be included in a particular market. Important for 2 reasons:
    - Company must understand who its actual/potential competitors are for products it sells or might sell in future
    - For public policy decisions
- Arbitrage: practice of buying at a low price at one location and selling at a higher price in another
- Market price: price prevailing in a competitive market

- Extent of a market: boundaries of a market, both geographical and in terms of range of products produced and sold within it

Competitive vs. non-competitive markets:

1. Perfectly competitive market: market with many buyers and sellers, so that no single buyer or seller has a significant impact on price
2. Non-competitive markets: individual firms can jointly affect the price (oil market)

Real vs nominal price:

- Real: price of a good relative to aggregate measure of prices & is adjusted for inflation (also known as constant-dollar price)
- Nominal: absolute price of good & is unadjusted for inflation
- Consumer price index (CPI): measure of the aggregate price level
- Produce price index (PPI): measure of the aggregate price level of intermediate products and wholesale goods

Example: find the real 2015 price of butter in terms of 1970 dollars knowing that

- CPI 1970 = 38.8
- CPI 2015 = 237.0
- Nominal price 2015 = $3.48

$$\frac{CPI\ 1970}{CPI\ 2015} x\ price\ 2015 = \frac{38.8}{237.0} x 3.48 = \$0.57$$

Percentage change in real price:

$$\frac{real\ price\ in\ 2015 - real\ price\ in\ 1970}{real\ price\ in\ 1970} = \frac{1.34-2.05}{2.05} = -0.34 = -34\%$$

CHAPTER 2

Supply and demand:

Supply curve: relationship between the quantity of a good that producers are willing to sell and price of the good

- $supply\ curve\ :\ Q_S = Q_S(P)$
- The higher the price, the more firms are able and willing to produce and sell
- Other variables that affect supply:
    - Production costs, wages, interest charges, costs of raw materials

Demand curve: shows how much of a good consumers are willing to buy as the price/unit changes

- *demand curve* : $Q_D = Q_D(P)$
- Other variables that affect demand curve: income

Substitutes and complementary goods:

- Substitutes: 2 goods for which an increase in the price of one leads to an increase in the quantity demanded of the other
- Complements: two goods for which an increase in the price of one leads to a decrease in the quantity demanded of the other

Normal vs. inferior goods:

- Normal: positive relationship with income; as income increases, so does demand for normal good
- Inferior: demand declines as level of income increases

The market mechanism:

Equilibrium: price that equates the quantity supplied to the quantity demanded

Market mechanism: tendency in a free market for price to change until the market clears

Surplus: situation in which the quantity supplied exceeds the quantity demanded

Shortage: situation in which the quantity demanded exceeds the quantity supplied

Elasticities of supply and demand:

Elasticity: percentage change in one variable resulting from a 1-percent increase in another

Price elasticity of demand: % change in quantity demanded of a good resulting from a 1-percent increase in its price.

- Usually a **negative** value → e.g.: -2, we say that elasticity is **2 in magnitude**
- Price elastic: when price elasticity is greater than 1 in magnitude
- Price inelastic: when price elasticity is less than 1 in magnitude

price elasticity of demand : $E_P = \frac{(\%\Delta Q)}{(\%\Delta P)} = \frac{\Delta Q/Q}{\Delta P/P} = \frac{P\Delta Q}{Q\Delta P}$

Linear demand curve: demand curve that is a straight line
linear demand curve : $Q = a - bP$

Infinitely vs. completely inelastic demand:

- Infinitely inelastic demand: consumers will buy as much of a good as they can get at a single price, but for any higher price the quantity demanded drops to 0, while for any lower price the quantity demanded increase without limit
- Completely inelastic demand: principle that consumers will buy a fixed quantity of a good regardless of its price

Income elasticity of demand: % change in the quantity demanded resulting from a 1-percent increase in income

$$E_I = \frac{\Delta Q/Q}{\Delta I/I} = \frac{I}{Q}\frac{\Delta Q}{\Delta I}$$

Cross-price elasticity of demand: % change in the quantity demanded of one good resulting from a 1-percent increase in the price of another

- *Substitutes:* cross-price elasticity of demand = positive
    - Rise in the price of a product makes demand for its substitute increase
- *Complements:* cross-price elasticity of demand = negative
    - Rise in the price of a product makes demand for its complement negative

$$E_{Q_X P_Y} = \frac{\Delta Q_X/Q_X}{\Delta P_Y/P_Y} = \frac{P_Y}{Q_X}\frac{\Delta Q_X}{\Delta P_Y}$$

Price elasticity of supply: percentage change in quantity supplied resulting from a 1-percent increase in price. Usually positive, because higher price leads to suppliers increasing output

Point vs. Arc elasticities:

- Point elasticity of demand: price elasticity of a particular point on the demand curve
- Arc elasticity of demand: price elasticity calculated over a range of prices

$$\textit{arc elasticity}: \; E_P = (\Delta Q/\Delta P)(\overline{P}/\overline{Q})$$

* $\overline{P}$ = average price; $\overline{Q}$ = average quantity

Short run vs. long run elasticities

1. Short-run: 1 year or less
2. Long-run: enough time is allowed for consumers/producers to adjust fully to price change

Demand: is much more price elastic in the long run than in the short run, it takes time for people to change their consumption practices. As in people are more sensitive to prices in the long run than in the short run

- Demand & durability: the more durable an item is, the more elastic demand is in the short run; the total stock of each good owned by consumer is large relative to annual production (car, fridges, etc)

- Income elasticities:
    - Most goods (foods, beverages, fuels, etc): income elasticity of demand is larger in the long run than in short run
    - Durable good: income elasticity of demand is larger in short run than in long run
- Cyclical industries: in which sales tend to magnify cyclical changes in gross domestic product and national income

Supply: elasticities of supply also differ in long-run and short-run

- For most products: long-run supply is much more price elastic than short-term supply
- Supply & durability:
    - Durable goods: Supply is more elastic in short-run

Understanding and predicting the effects of changing market conditions

- "Fit" linear demand and supply curves to market data
- Goal: to write down supply and demand curves that "fit" (are consistent with) these numbers:
    - Equilibrium price: P*****
    - Equilibrium quantity: Q*****
    - Price elasticity of supply: E_S
    - Price elasticity of demand: E_D
- Problem: choose numbers for constants a, b, c, d
    - DEMAND: Q = $a - bP$
    - SUPPLY: Q = $c + dP$
- Solution: 2-step procedure:
    1. Reconstruct demand and supply formulas:
        a. $E_D = -b(P^*/Q^*)$
        b. $E_S = d(P^*/Q^*)$
    2. Solve for remaining constants a & c
        a. Example: a = $Q^* + bP^*$

Example 1: $E_S = 1.5$, $P^* = \$3.00$, $Q^* = 18$

SUPPLY:

1. $1.5 = d(3/18) = d/6$; $d = (1.5)(6) = 9$
2. $18 = c + (9)(3) = c + 27$; $c = 18 - 27 = 9$

Therefore Supply curve: Q = $-9 + 9P$

DEMAND:

1. $-0.5 = -b(3/18) = -b/6$; $b = (0.5)(6) - 3$
2. $18 = a = (3)(3) = a - 9$; $a = 18 + 9 = 27$

Therefore Demand curve: Q = 27 − 3*P*

Example 2: demand depend on income as well as price = Demand: $Q = a - bP + fI$.
*I = index of aggregate income or GDP

$E_D = 1.3$; I = 1.0, $Q^* = 18 \rightarrow 1.3 = (1/18)\,(f) \rightarrow f = (1.3)(18)/1 = 23.4$

$18 = a - 3(3) + 23.4\,(1) \rightarrow a = 3.6$

CHAPTER 3: THE ANALYSIS OF COMPETITIVE MARKETS

3.1 Evaluating the gains and losses from government policies (consumer and producer surplus)

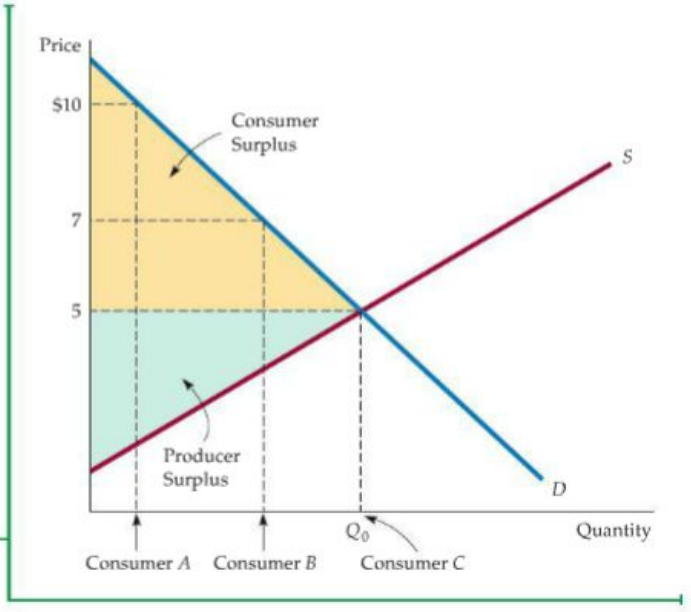
Shortage: excess demand

Consumer surplus: measures the aggregate net benefit that consumers obtain from a competitive market

- Defined as the difference between what a consumer is willing to pay for a good and the consumer actually pays when buying it

FIGURE 3.1
CONSUMER AND PRODUCER SURPLUS

Consumer *A* would pay $10 for a good whose market price is $5 and therefore enjoys a benefit of $5. Consumer *B* enjoys a benefit of $2, and Consumer *C*, who values the good at exactly the market price, enjoys no benefit. Consumer surplus, which measures the total benefit to all consumers, is the yellow-shaded area between the demand curve and the market price. Producer surplus measures the total profits of producers, plus rents to factor inputs. It is the green-shaded area between the supply curve and the market price. Together, consumer and producer surplus measure the welfare benefit of a competitive market.



Producer surplus: measures the aggregate net benefit to produces

- Defined as the sum over all units produced of the difference between the market price of the good and the marginal cost of its production

- The benefit that lower-cost producers enjoy by selling at the market price

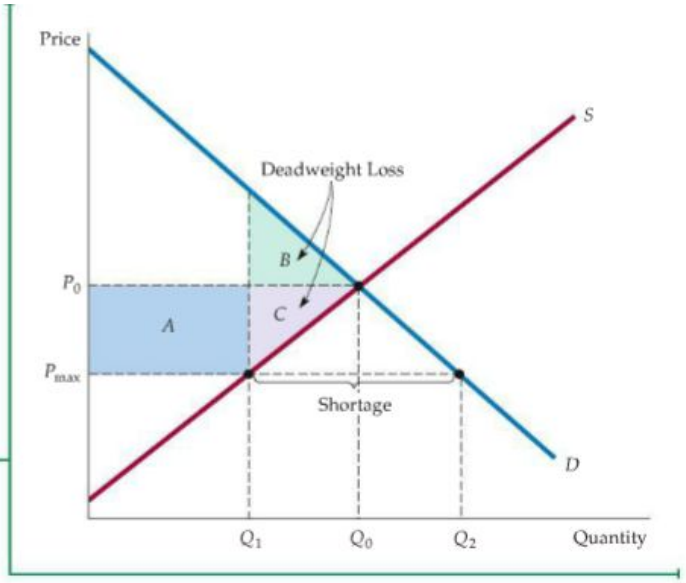
Welfare effects: gains and losses to consumers and producers

Different changes in supply and demand and their impact:

1. **Change in consumer surplus:**
    - Increase in consumer surplus:
        i. Benefit: consumers who can still buy the good
            - Can buy the good at a lower price
        ii. Don't benefit: those who can no longer buy the good lose surplus
            - Those who have been rationed out of the market because of the reduction in production and sales
    - *consumer surplus* $= A - B$

FIGURE 3.2
CHANGE IN CONSUMER AND PRODUCER SURPLUS FROM PRICE CONTROLS

The price of a good has been regulated to be no higher than P_{max}, which is below the market-clearing price P_0. The gain to consumers is the difference between rectangle *A* and triangle *B*. The loss to producers is the sum of rectangle *A* and triangle *C*. Triangles *B* and *C* together measure the deadweight loss from price controls.



2. **Change in producer surplus:**
    - Benefit: those who will receive a lower price
    - Don't benefit: those who leave the market
    - *Change in producer surplus* : $-A - C$
3. **Deadweight loss:** net loss of total (consumer plus producer) surplus
    - *total change in surplus* $= (A - B) + (-A - C) = -B - C$
    - It is an inefficiency caused by price controls
    - Loss in producer surplus exceeds gain in consumer surplus

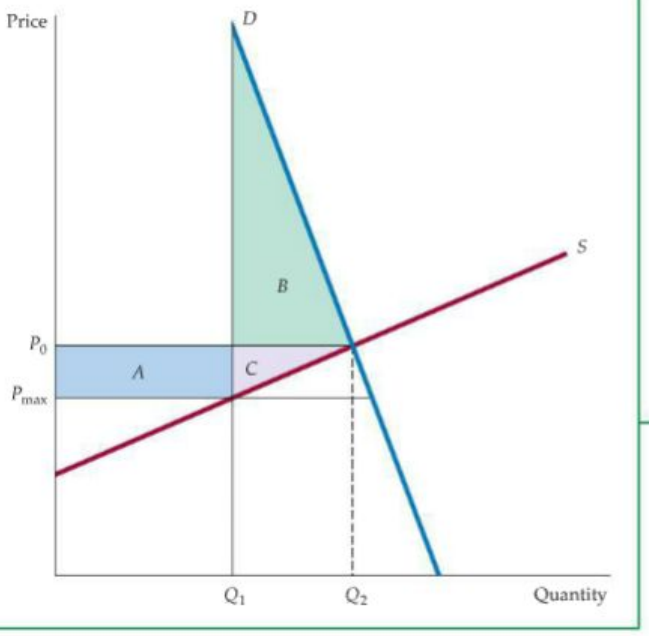


FIGURE 3.3
EFFECT OF PRICE CONTROLS WHEN DEMAND IS INELASTIC

If demand is sufficiently inelastic, triangle *B* can be larger than rectangle *A*. In this case, consumers suffer a net loss from price controls.

3.2 The Efficiency of a competitive market

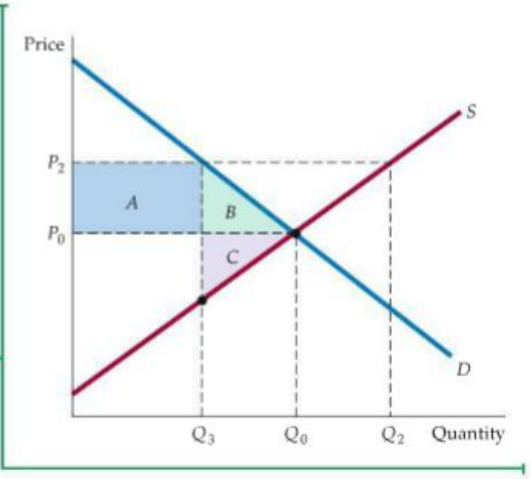
Economic efficiency: the maximization of aggregate consumer and producer surplus

Market failure: unregulated competitive market is inefficient because prices fail to provide proper signals to consumers and producers. 2 ways in which market failure can occur:

1. **Externalities**: action taken by producer or consumer which affects other producers or consumers but its not accounted for by the market price
2. **Lack of information**: consumers are not informed about quality of product and so cannot make purchase decisions

FIGURE 3.5
WELFARE LOSS WHEN PRICE IS HELD ABOVE MARKET-CLEARING LEVEL

When price is regulated to be no lower than P_2, only Q_3 will be demanded. If Q_3 is produced, the deadweight loss is given by triangles *B* and *C*. At price P_2, producers would like to produce more than Q_3. If they do, the deadweight loss will be even larger.



3.3 Minimum prices

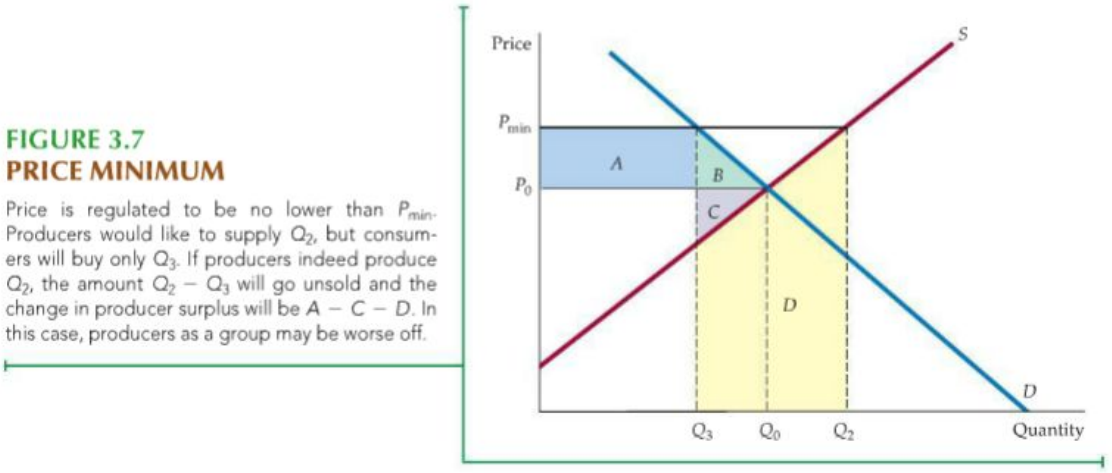


FIGURE 3.7
PRICE MINIMUM

Price is regulated to be no lower than P_{min}. Producers would like to supply Q_2, but consumers will buy only Q_3. If producers indeed produce Q_2, the amount $Q_2 - Q_3$ will go unsold and the change in producer surplus will be $A - C - D$. In this case, producers as a group may be worse off.

Change in consumer surplus:

$\Delta CS = -A - B$

Change in producer surplus

$\Delta PS = A - C - D$

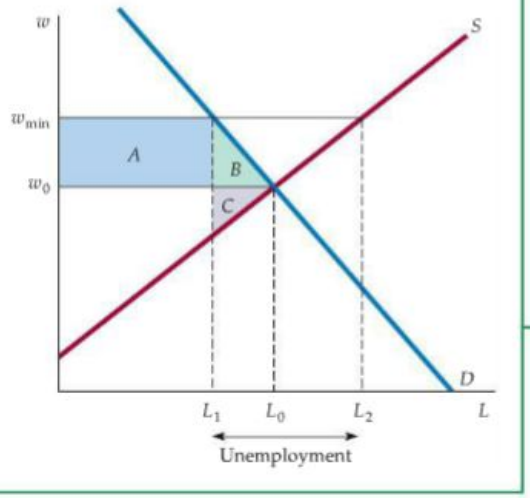


FIGURE 3.8
THE MINIMUM WAGE

Although the market-clearing wage is w_0, firms are not allowed to pay less than w_{min}. This results in unemployment of an amount $L_2 - L_1$ and a deadweight loss given by triangles *B* and *C*.

3.4 Price supports and production quotas

Price support: price set by government above free-market level and maintain by governmental purchases of excess supply.

- Government can also increase prices by restricting production either directly or through incentives to producers
- Consumers: $\Delta CS = -A - B$
- Producers: $\Delta PS = A + B + D$
- Government: $\Delta CS + \Delta PS - \text{Cost to govt.} = D - (Q_2 - Q_1)P_S$

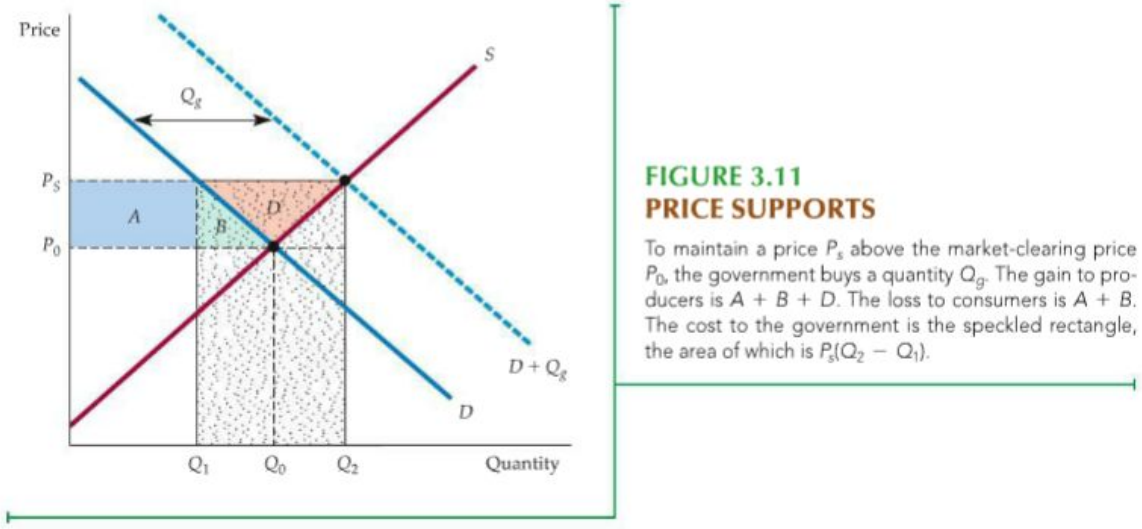


FIGURE 3.11
PRICE SUPPORTS

To maintain a price P_s above the market-clearing price P_0, the government buys a quantity Q_g. The gain to producers is $A + B + D$. The loss to consumers is $A + B$. The cost to the government is the speckled rectangle, the area of which is $P_s(Q_2 - Q_1)$.

Production quotas

- Government can cause price of good to rise by reducing supply by setting quotas on how much each firm can produce

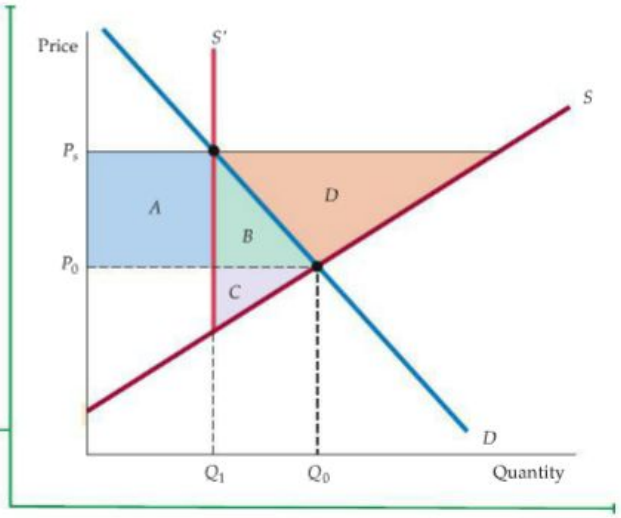


FIGURE 3.12
SUPPLY RESTRICTIONS

To maintain a price P_s above the market-clearing price P_0, the government can restrict supply to Q_1, either by imposing production quotas (as with taxicab medallions) or by giving producers a financial incentive to reduce output (as with acreage limitations in agriculture). For an incentive to work, it must be at least as large as $B + C + D$, which would be the additional profit earned by planting, given the higher price P_s. The cost to the government is therefore at least $B + C + D$.

Incentive programs:

- *Acreage limitation programs:* give farms financial incentives to leave some of their acreage idle

Production quotes cause:

- Consumer surplus: $\Delta CS = -A - B$
- Producer surplus: $\Delta PS = A - C + Payments\ for\ not\ producing$
- Cost to government and total change of producer surplus:
  $\Delta PS = A - C + B + C + D = A + B + D$
- Change in welfare: $\Delta WELFARE = -A - B + A + B + D - B - C - D = -B - C$

3.5 Import quotas and tariffs

Government uses import quota & tariffs to keep domestic price of a produce above work levels and enable domestic industry to enjoy higher profits than under free trade

- Import quota: limit on the quantity of a food that can be imported
- Tariff: tax on an imported good

Impact on:

- $\Delta CS = -A - B - C - D$
- $\Delta PS = A$

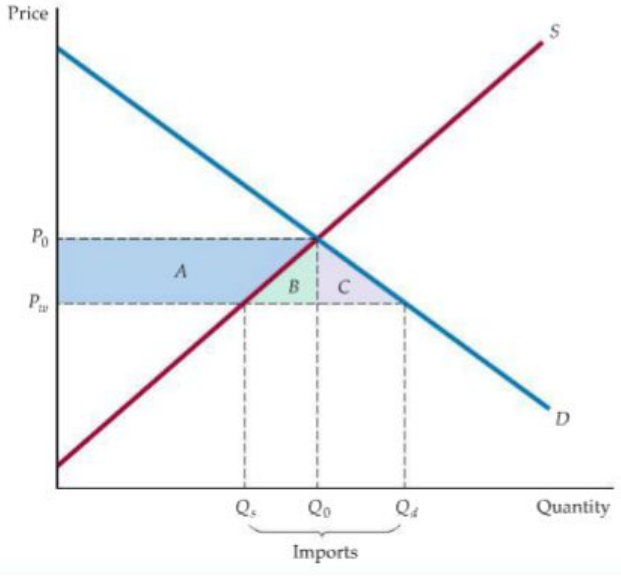
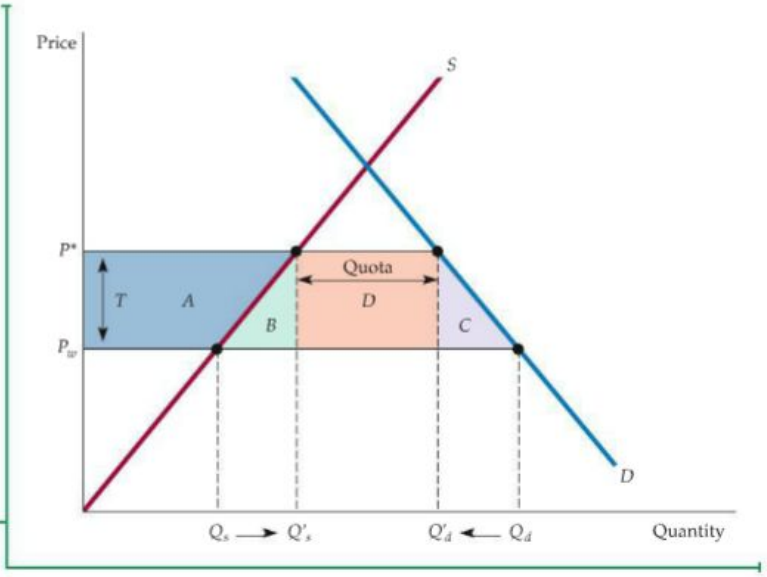


FIGURE 3.16
IMPORT TARIFF OR QUOTA THAT ELIMINATES IMPORTS

In a free market, the domestic price equals the world price P_w. A total Q_d is consumed, of which Q_s is supplied domestically and the rest imported. When imports are eliminated, the price is increased to P_0. The gain to producers is trapezoid A. The loss to consumers is $A + B + C$, so the deadweight loss is $B + C$.

FIGURE 3.17
IMPORT TARIFF OR QUOTA (GENERAL CASE)

When imports are reduced, the domestic price is increased from P_w to P^*. This can be achieved by a quota, or by a tariff $T = P^* - P_w$. Trapezoid A is again the gain to domestic producers. The loss to consumers is $A + B + C + D$. If a tariff is used, the government gains D, the revenue from the tariff, so the net domestic loss is $B + C$. If a quota is used instead, rectangle D becomes part of the profits of foreign producers, and the net domestic loss is $B + C + D$.



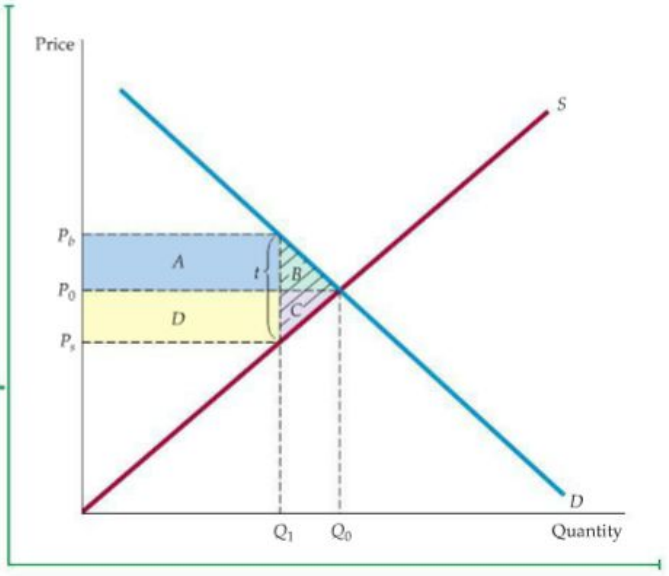
3.6 The impact of a tax or subsidy

The effects of specific tax:

- *Specific tax:* tax of a certain amount of money per unit sold
- *Ad valorem tax:* proportional; state sales tax

FIGURE 3.19
INCIDENCE OF A TAX

P_b is the price (including the tax) paid by buyers. P_s is the price that sellers receive, less the tax. Here the burden of the tax is split evenly between buyers and sellers. Buyers lose $A + B$, sellers lose $D + C$, and the government earns $A + D$ in revenue. The deadweight loss is $B + C$.



Market clearing requires 4 conditions to be satisfied after tax is in place:

1. Quantity sold and buyer's price must lie on the demand curve (b/c buyers are interested only in price they must pay)

2. Quantity sold and seller's price must be on supply curve (b/c sellers are only interested in amount of money the receive net of tax)
3. Quantity demanded must = quantity supplied
4. Difference between price buyer pays and price seller receives must equal the tax

<u>Conditions summarized as:</u>

$Q^D = Q^D(P_D)$

$Q^S = Q^S(P_S)$

$Q^D = Q^S$

$P_D - P_S = t$

<u>Tax results in:</u>

- Revenue to government: t x Q^* = A + D
- $\Delta CS = -A - B$
- $\Delta PS = -C - D$
- DW loss= $\Delta PS + \Delta CS + rev\ to\ govt = -A - B - C - D + AD = -B - C$

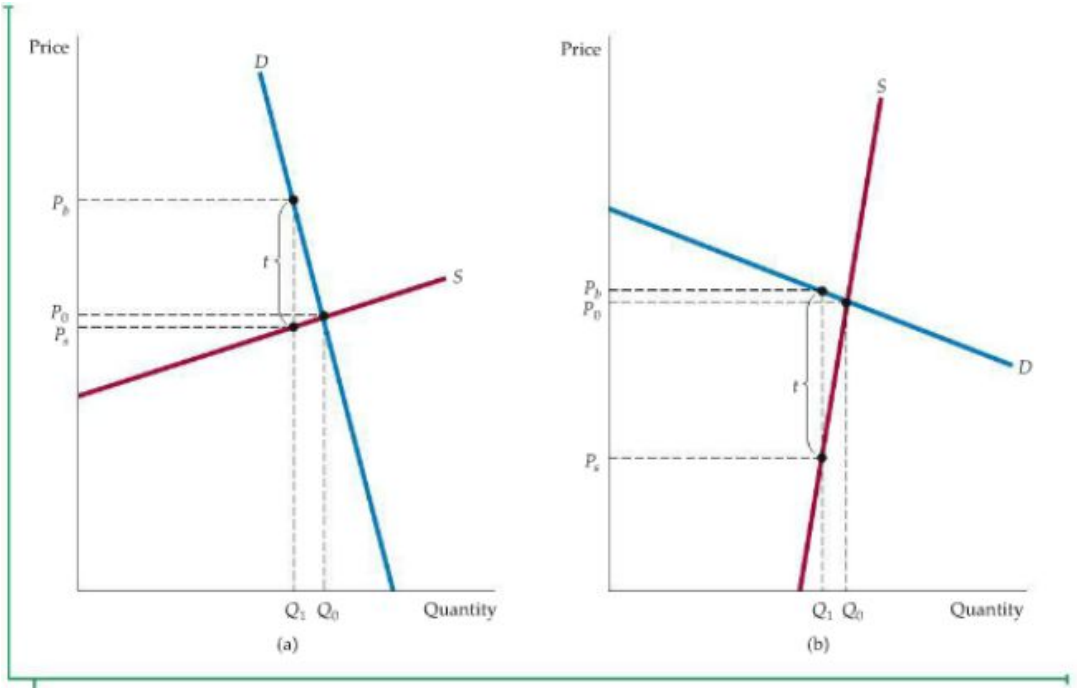


FIGURE 3.20
IMPACT OF A TAX DEPENDS ON ELASTICITIES OF SUPPLY AND DEMAND
(a) If demand is very inelastic relative to supply, the burden of the tax falls mostly on buyers.
(b) If demand is very elastic relative to supply, it falls mostly on sellers.

Pass-through fraction:
Used to calculate % of the tax borne by buyers
$E_S/(E_S - E_D)$
Used to calculate % of tax borne by suppliers
$-E_D/(E_S - E_D)$

Tax Impact on:

- **Not beneficial to:**
  - Suppliers when E_d/E_S is large
  - Buyers when E_d/E_S is small

The effects of a subsidy

- *Subsidy:* payment reducing the buyer's price below the seller's price (negative tax)
- Beneficial to:
  - Suppliers when E_d/E_S is large
  - Buyers when E_d/E_S is small
- Conditions:

$$Q^D = Q^D(P_b) \quad \text{(3.2a)}$$
$$Q^S = Q^S(P_s) \quad \text{(3.2b)}$$
$$Q^D = Q^S \quad \text{(3.2c)}$$
$$P_s - P_b = s \quad \text{(3.2d)}$$

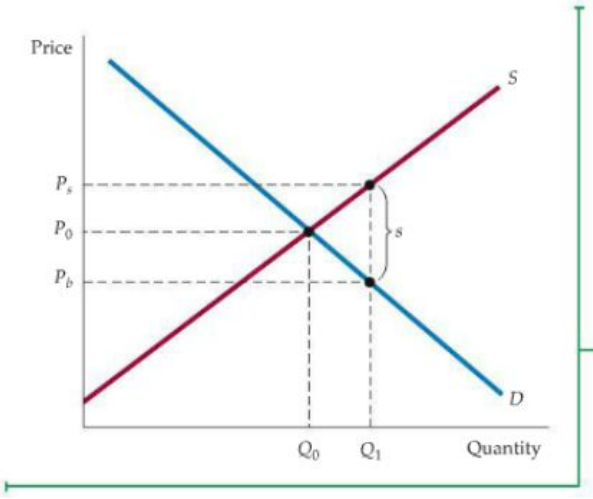


FIGURE 3.21
SUBSIDY
A subsidy can be thought of as a negative tax. Like a tax, the benefit of a subsidy is split between buyers and sellers, depending on the relative elasticities of supply and demand.

CHAPTER 4: OVERVIEW OF THE LABOR MARKET

Labor market: The market that allocates workers to jobs and coordinates employment decisions

- National labor market and local labor market
- Internal labor market: When a formal set of rules and procedures guides and constrains the employment relationship within a firm
- Buyers = employers; sellers = workers
- *Labor force:* refers to all those over 16 years of age who are employed, actively seeking work or expecting recall from a layoff. Consists of the employed and unemployed
- Labor force participation rate: labor force divided by population

4 major flows:

- Employed: become unemployed by quitting voluntarily or being laid off
- Unemployed: obtain employment by being newly hired or being recalled ot a job from which they were temporarily laid off
- Dropping out: Those in labor force, whether employed or unemployed, can leave the labor force by retiring or otherwise deciding against taking or seeking work for pay
    - Those who have never worked or looked for a job expand the labor force by entering it while those who have dropped out do so by entering the labor force

Unemployment rate: ratio of those in labor force to those who are unemployed

Tight labor market: when employers search for employees: most people who want a job are already working, unemployment is low and job vacancies tend to be high.

Slack labor market: when employers cut back on recruiting new employees, while the few job vacancies that do exist tend to be filled quickly. In this case, unemployment is higher due to a reduction in overall hiring relative to a decline in workers quitting and to an increase in layoffs

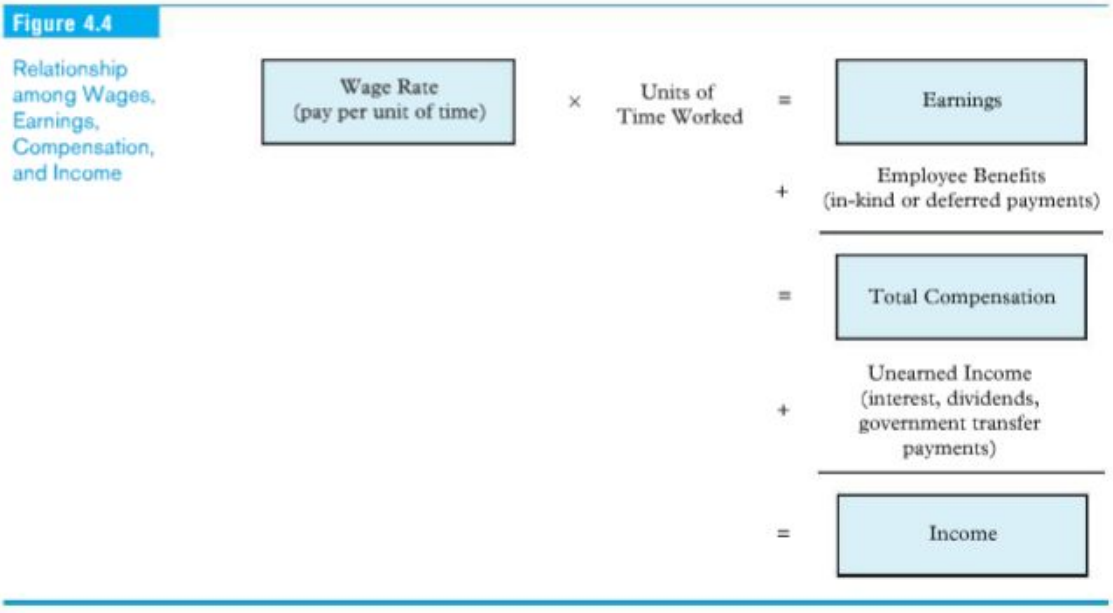
The earnings of labor:

- Nominal wage: what workers get paid per hour in current dollars' nominal wages are most useful in comparing the pay of various workers at a given time
- Real wages: nominal wages divided by some measure of prices, suggest how much can be purchased with workers' nominal wages
    - Useful in comparing purchasing power of worker's earnings over a period of time when both nominal wages and product prices are changing
    - E.g.: worker earns $64/day and shoes cost $32 then real wage = 64/32 = 2

Wages, earnings and income:

- Wages: payment for a unit of time

- Earnings: wages multiplied by # of time units (typically hours) worked
- Total compensation: consists of earnings plus employee benefits
    - Benefits that are either payments in kind or deferred
        - *Payments in kind:* health care, insurance. Employee receives a service or an insurance policy rather than money. Paid vacation time
        - *Deferred payments:* retirement benefits
- Income: includes earnings, benefits, unearned income , dividends or interest received on investments and transfer payments received from govt, welfare payments, unemployment compensation, and the like

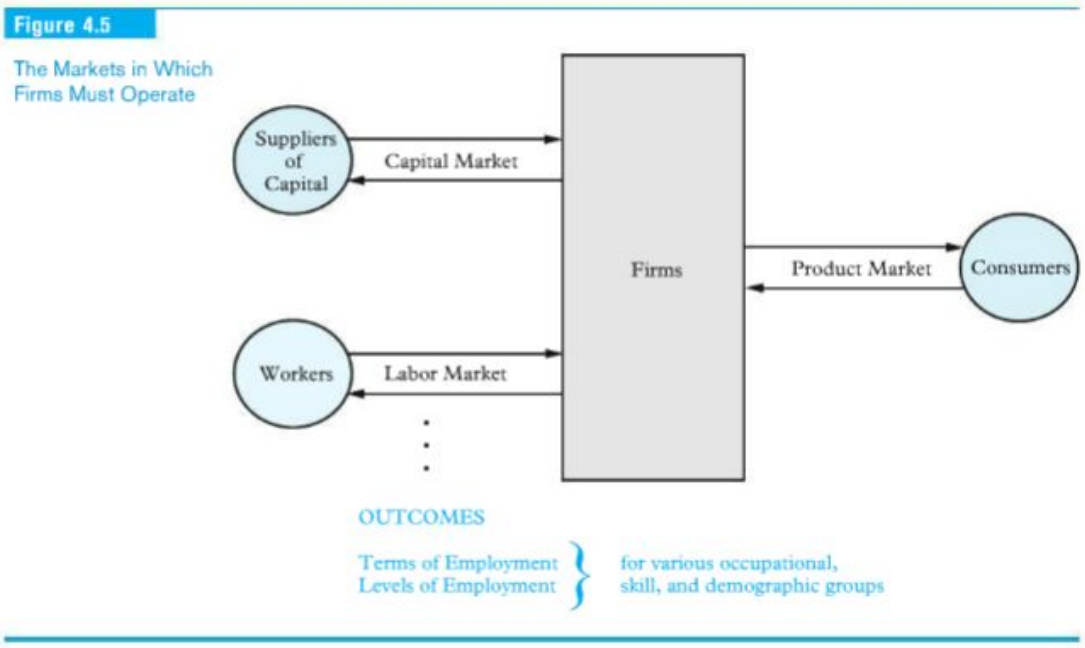


Firms face three market: **labor, capital, and product market**

- Changes in any of these market will affect the demand in labor market.

Major labor outcomes are due to:

1. The terms of employment (wages, compensation level, working conditions)
2. Levels of employment

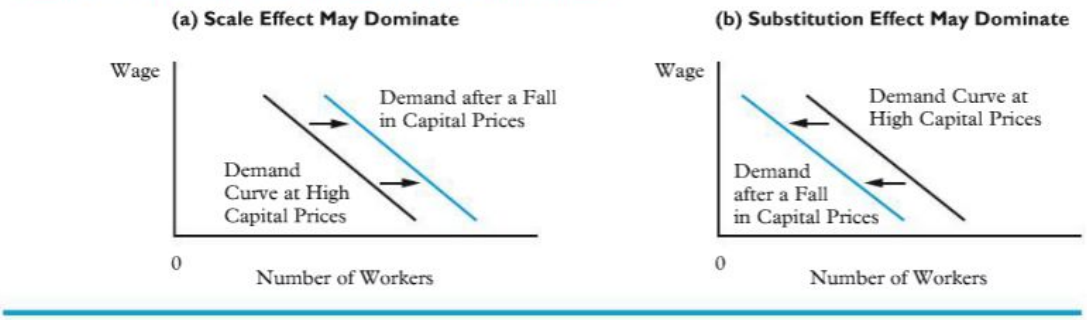


Demand for labor can be affected by:

1. Wage changes:
    - **Scale effect:** increase in production which increases the demand for labour.
    - **Substitution effect:** capital is substituted for labor in the production process. Use of more capital-intensive technologies, decreases the demand for labour.
2. Demand for the product of a particular industry increases causing scale effect
    - Increases the labor desired at any wage level that might prevail (demand shifts to the right)
3. Changes in supply of capital causing substitution effect and scale effect
    - Capital prices fall to 50% of their prior level; a fall in capital prices generates 2 **opposite** effects on the demand curve
        i. **Low capital prices = Scale effect:** costs of producing tend to decline which increases production and increases labour. Labor demand shifts to right
        ii. **High capital prices = Substitution effect**: firm adopts capital-intensive technologies in response to cheaper capital and labour decreases. Labor demand will shift to the left

Figure 4.8

Possible Shifts in Demand for Labor Due to Fall in Capital Prices



Movement along curve vs shifts of curve:

1. Movement along the curve: when wage changes and other forces are unchanged
2. Shifts of curve: when other forces change as well

Demand for labor can be analyzed at 3 levels:

1. Analyze demand for labor by particular firm
2. Analyze effects of wage increase on employment by using an industry demand curve
3. Use a market demand curve to see how wage increase would affect entire labor market for particular firm in all industries

Long run vs. short run

- Short run: hard to substitute capital for labor (or vice versa) & customers are less responsive to product demand in respect to price increase
- Long run: responses to changes in wages or other forces affecting demand for labor are larger and more complete
- Demand for labor in short run is relatively inelastic as compared to the long run.

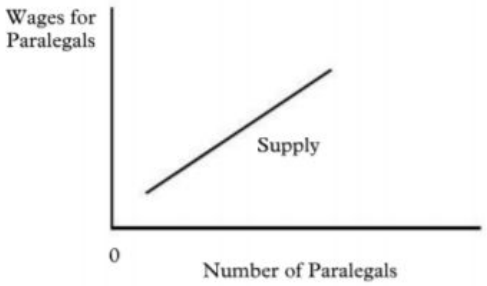
Supply of labor: 1. Wage changes in the industry 2. Wages change in other industry Market supply curve vs. labor supply curve to a firm

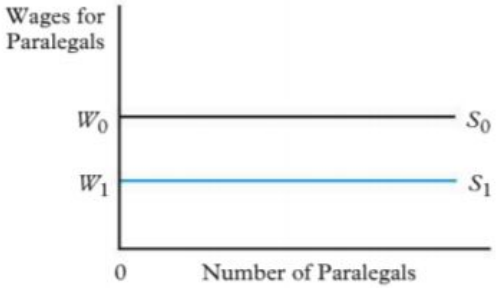
The supply of labor

Wage changes in the industry :wages/salaries of certain industry rise: more people want to enter this industry; hence supply of labor to market is positively related to wage rate prevailing in that market

Wages/salaries of other industry increase: then less people want to be in particular industry and supply decreases

Market supply vs. labor supply curve to a firm





Supply to firms:

- The difference in slope between market supply curve and supply curve to firm is directly related to type of choice facing workers
- If wages for paralegals fall (for example), not everyone would withdraw from market bc jobs of insurance and paralegal are **not perfect substitutes**
- Horizontal supply curve: reflects supply decisions made among alternatives that **are perfect substitutes** for each other

Figure 4.10

Shift in Market Supply Curve for Paralegals as Salaries of Insurance Agents Rise

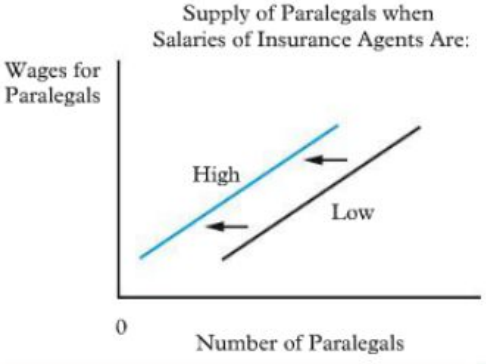
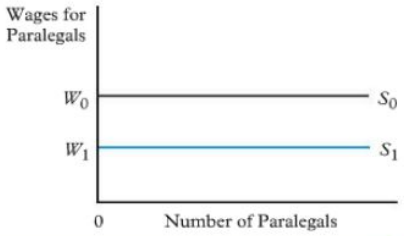


Figure 4.11

Supply of Paralegals to a Firm at Alternative Market Wages



Determining wage:

- *Market-clearing wage:* wage rate at which demand equals supply, where there is no surplus or shortage. The market is in equilibrium
    - Market-clearing wage, W_e = *going wage*
- *Above-market wages:* overpaid if their wages are higher than the market-clearing wage for their job.
- *Below-market wages:* underpaid if their wages are below market-clearing levels. There will be a labor shortage in case of underpaid wages.
- *Economic Rents:* amount that wage exceeds one's reservation wage which is the wage below which worker would refuse job
    - Find equilibrium wage first
    - Subtract equilibrium wage by wage being paid = economic rent

Figure 4.19

Labor Supply to the Military: Different Preferences Imply Different "Rents"

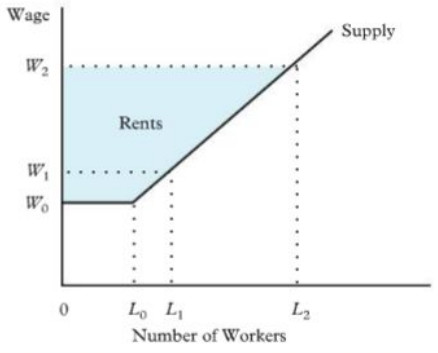


Figure 4.12

Market Demand and Supply

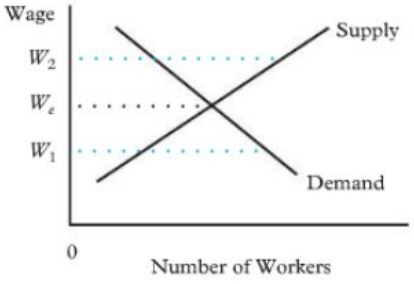
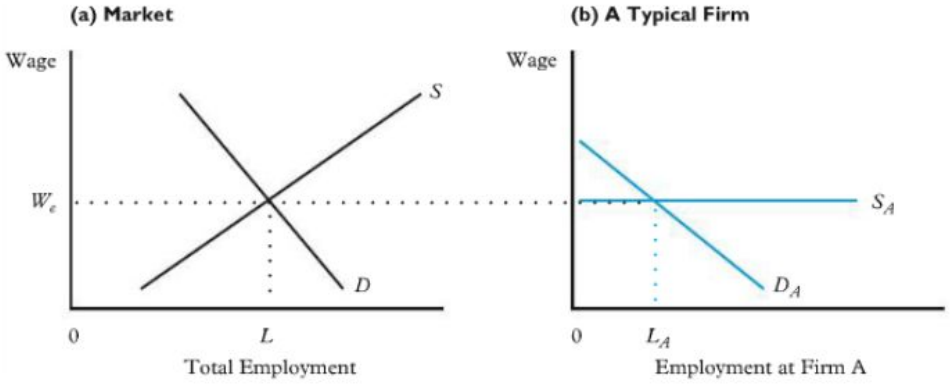


Figure 4.13

Demand and Supply at the "Market" and "Firm" Levels



by the market and "announced" to individual market participants. Figure 4.13 graphically depicts *market* supply and demand in panel (a), along with the supply and demand curves for a typical *firm* (firm A) in that market in panel (b). All firms in the market pay a wage of W_e' and total employment of L equals the sum of employment in each firm.

Disturbing the equilibrium

- Rightward shift of demand (increasing demand): would create a labor shortage
- Left shift of supply (decrease)/rightward shift in labor demand (increase): market wage rises a lot
- Rightward shift supply (increase)/leftward shift demand (decrease): fall in market-clearing wage rate

Figure 4.15

New Labor Market Equilibrium after Supply Shifts Left

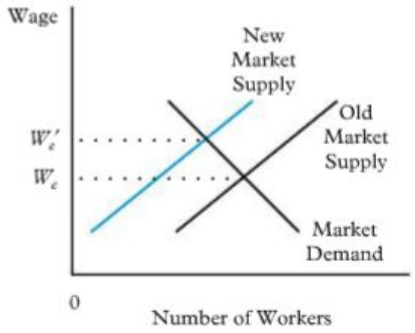
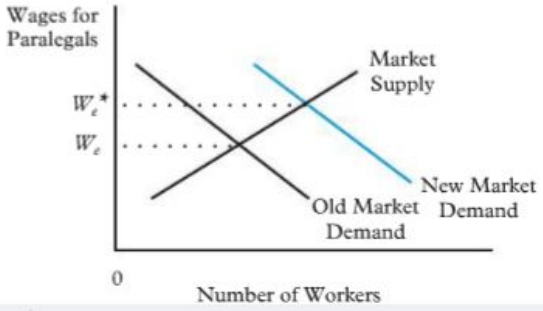


Figure 4.14

New Labor Market Equilibrium after Demand Shifts Right



Disequilibrium and nonmarket influences:

- Non Market forces: laws, customers, institutions constraining the choice of individuals and firms. Usually serve to keep wages above market levels
    - If wages are held above market-clearing levels, unemployment will result. Labor demand curve shifts to the left, causing the unemployment increase to even a higher level.
    - The above-market wage also has the effect to deter the growth of new jobs.
    - Technological change leads to a fall in the demand for less-skilled and less-educated lower-paid workers. (Causing the demand curve of labor shift to the left). This leads to a decrease in real wage of these workers.

CHAPTER 5: The demand for labor

Labor demand when the product market is not competitive

- Based on the assumptions that
    - Firm is a price taker
    - Firm is a wage taker
    - Makes decisions only about the levels of outputs and inputs

Profit maximization: where profit = total revenue - total cost

- Firms (employers of labor) seek to maximize profits
- Decision rules:
    - **Add input**: Income of one more unit of input **exceeds** additional expense.
    - **Reduce input:** Income of one more unit of input is **less than** additional expense.
    - **No change:** Income generated by one more unit of input = additional expense
- Two thing to note:
    1. A firm can only change variables within it control (increasing or decreasing output NOT price)
        - As long as marginal revenue from added unit of output exceeds marginal cost, firm will continue to expand output
        - Marginal cost exceeds marginal output: firm will decrease output
        - Firm can increase/decrease output using 2 types of input: **labor and capital**
    2. Theory must address small (marginal) changes that must be made almost daily. Holding employment of other inputs constant

Marginal income from an additional unit of input

1. **Marginal revenue product (MP)** = change in physical output produced (marginal product) x MR generated per unit of physical output
    - Example:
        - 20,000 spectators attendance increase
        - 25$ for each additional fan
        - Marginal revenue product = 20,000 x $25 = $500,000
    - Two types:
        - **Marginal product of labor:** the change in physical output produced by change in units of labor, holding capital constant. $M_{P_L} = \Delta Q \div \Delta L$
        - **Marginal product of capital:** the change in output associated with a one-unit change in the stock of capital, holding labor constant $M_{P_K} = \Delta Q \div \Delta K$
2. **Marginal Revenue (MR): :** The extra revenue generated by the selling of the one extra unit of good.
    - Pure competitive market (no control over price): then MR=P, P is the price of the good, and all firms are price takers.
    - Differentiated product (some control): extra units of output can be sold only if product price is reduced
3. **Marginal revenue product of labor:**
    - General case: $MRP_L = MP_L \, x \, MR$
    - When the product market is perfectly competitive, then MR=P, in the above equation

4. **Marginal Revenue Product of capital:**
    - $MRPK = MPK * MR$ In the general form
    - $MRPK = MPK * P$ When the product market is perfectly competitive

Marginal expense of an added input:

- Marginal expense of capital (C): the expense of renting a unit of capital for one time period.
- Marginal expenses of labor (ME_L): assume that the labor market is perfectly competitive, therefore, the labor supply curve to firms is horizontal at the going wage w0. w0 is the marginal expense of labor.

The short-run demand for labor when both product and labor markets are competitive

- In the short-run:
    - firm only needs to decide whether to alter its output level, where only labor can be adjusted. Capital is fixed
    - Profit maximization condition takes place when MP_L decreases. **Assume MP_L is always decreasing** (diminishing marginal returns).
    - Profit maximization should satisfy condition: $MRP_L = ME_L$
        - If product market & labor market are perfectly competitive: MEL=w, and MR=P; therefore the above condition becomes: MP_L x P = w
            - The profit maximization for hiring labor in terms of physical quantities is therefore: $MPL = w/P$
            - The firm's demand for labor in the short run is equivalent to the downward-sloping segment of its MP_L schedule

A critical assumption: declining MP_L

- Positive MP_L: as long as output increases as labor is added
- Falling MP_L: as more input is used, MP_L declines → "law of diminishing returns": as employment expands, each additional worker has progressively smaller share of capital stock to work with. We assume MP_L is always falling

From profit maximization to labor demand

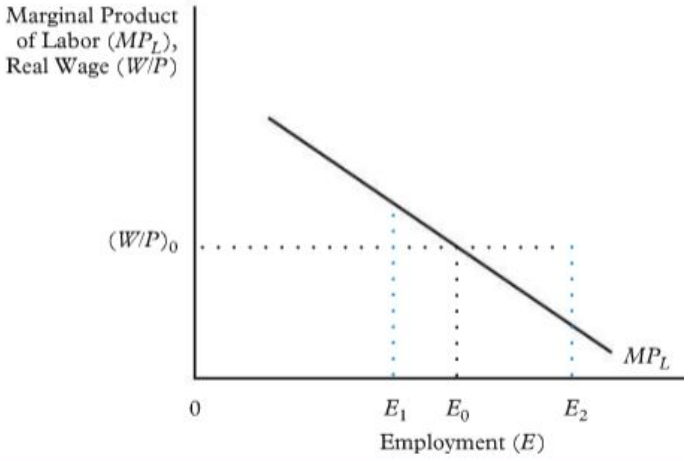
- Profits are maximized: when employment is such that any further one-unit change in labor would have a marginal revenue product equal to marginal expense:
    - $MRP_L = ME_L$
- Profit-maximizing level of labor input as that level at which
    - $MP_L \, x \, P = W$, stated in **monetary unit** (dollars)
- Profit-maximizing condition for hiring labor in terms of **physical units:**
    - $MP_L = W \div P$

Labor demand in terms of real wages:

- To maximize profits (given any real wage rate), a firm should stop employing labor at the point in which any additional labor would cost more than it would produce
    - Implies 2 things:
        - Employ labor until real wage = MP_L BUT not beyond that point
        - Profit-maximizing level of employment lies in range where MP_L is declining

Figure 5.1

Demand for Labor in the Short Run (Real Wage)

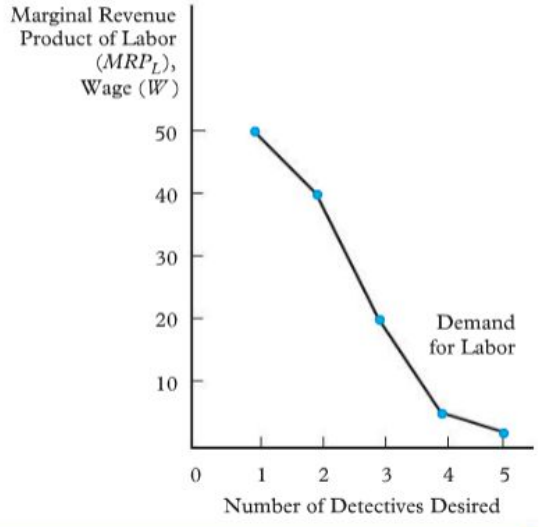


Labor demand in terms of money wages:

- Labor demand curve in the short run slopes downward because it is the MRP_L Curve
- The MRP_L curve slopes downward because of labor's diminishing marginal product
- The demand curve and the MRP_L curve coincide

Figure 5.2

Demand for Labor in the Short Run (Money Wage)



Market demand curves:

- Market demand curve (or schedule) is the summation of the labor demanded by all firms in a particular labor market at each level of the real wage
- Slopes downward as a function of the real wage
    - Real wage falls: number of workers that firms want to employ increases
    - Real wage increases: number of workers that firms want to employ decreases

Objections to the marginal productivity theory of demand:

1. Almost no employer is aware of marginal revenue product of labor. Employers are mostly unable to accurately measure output of individual workers
    - Answer to objection 1: employers must at least intuit them (profit maximizing conditions, measuring MRP_L) to survive in a competitive environment
    - Employers can know these concepts without verbalizing them
2. Many cases, it seems that adding labor while holding capital constant would not add to output at all. Example: 1 secretary, 1 computer. Adding a 2nd secretary with no computer will not generate more output
    - Answer to objection 2: two secretaries can take turns using computer, while other secretary is doing other work tasks

The demand for labor in competitive markets when other inputs can be varied

Labor demand in the long run

- To maximize profits, labor and capital must be adjusted so marginal revenue product of each equals its marginal expense
    - $MP_L x\, P = W$
    - $MP_K x\, P = C$ $(profit-maximizing\ condition\ for\ capital)$
- Isolating P
    - $P = W \div MP_L$
    - $P = C \div MP_K$
- Profit maximization requires that
    - 5.8 $W \div MP_L = C \div MP_K$, hence to maximize profits the firm must adjusts its labor and capital inputs so that marginal cost of producing an added unit of output using labor is equal to the marginal cost of producing an added unit of output using capital
        - $\frac{W}{MP_L}$ = added cost of producing an added unit of output when using labor to generate the increase in output
        - $\frac{c}{MP_K}$ = marginal cost of producing an extra unit of output using capital
- What would happen to demand for labor in the long run of the wage rate facing a profit-maximizing firm were to rise
    - The rise in W disturbs equality in equation 5.8 and the firm will want to cut back on use of labor even before it can adjust its capital which will raise MP_L
    - MP_K falls which will cause firm to want to reduce its stock of capital

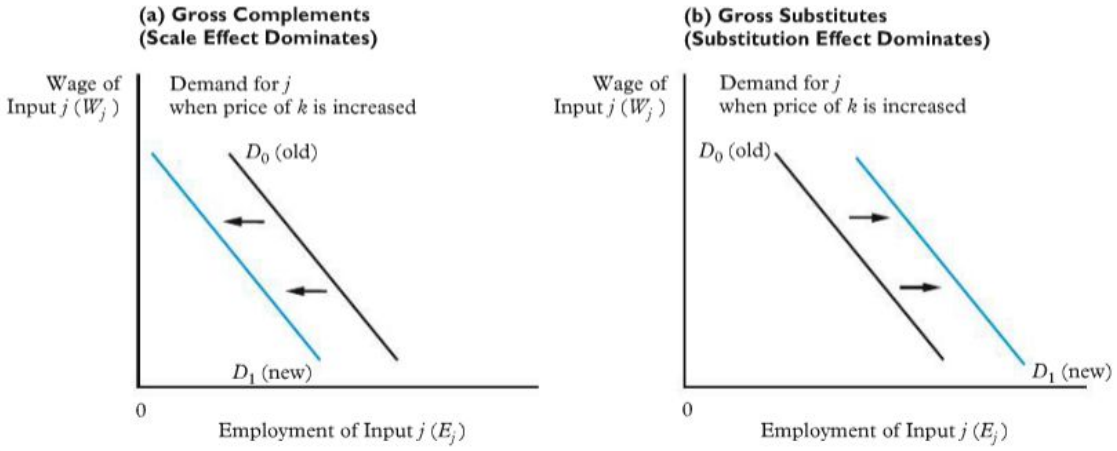
    - Rise in W will end equality in equation 5.8 = marginal cost of production using labor now exceeds marginal cost using capital
- Conclusion:
    - Increase in W = firm to reduce desired employment level for 2 reasons
        - Firm's profit-maximizing level of output will fall and associated reduction in required inputs (both capital and labor) is an example of the **scale effect**
        - Rise in W also causes firm to substitute capital for labor so it can again produce in the least-cost manner; changing mix of capital and labor in production process is known as **substitution effect**
        - **Scale & substitution effects of a wage increase:** have ambiguous effect on firm's desired stock of capital but both serve to reduce the demand for labor

<u>More than 2 inputs:</u>

- **Substitute inputs:** the greater use of one in producing output can compensate for reduced use of the other. Increases in price of the other input may shift the entire demand curve for a given category of labor either to right or left depending on strength of substitution and scale effects
- <u>Increase in price of one input shifts demand for other input to left:</u> scale effect has dominated and the 2 inputs are **gross complements**
- <u>Increase in price of one input shifts demand for other input to the right:</u> substitution effect has dominated and two inputs are **gross substitutes**
- **Perfect complements/complements in production:** two inputs must be used together
    - No substitution effect
    - Only scale effect
    - Two inputs must be gross complements

Figure 5.3

Effect of Increase in the Price of One Input (k) on Demand for Another Input (j), Where Inputs Are Substitutes in Production



Labor demand when the product market is not competitive

- Monopolistic, noncompetitive product markers on the demand for labor
- Are not price takers

Maximizing monopoly profits

- Are not price takers
- Can expand sales by reducing product price, means that their marginal revenue from an extra unit of output is less than product price ($ME_L = W$)
- Monopolist would hire workers until marginal revenue product of labor (MRP_L) = wage rate
    - $MRP_L = MR \times MP_L = W$
- Express demand for labor in short run in terms of real wage:
    - $\frac{MR}{P} x MP_L = \frac{W}{P}$
- $\frac{MR}{P}$ always less than 1: since marginal revenue is always less than a monopoly's product price
- Demand curve monopoly will lie below competitive market demand curve
    - Level of employment and level of profit-maximizing output is lower than competitive market

Do monopolies pay higher wages?

- Pay high wages and pass costs along to consumers in the form of higher prices

Policy application: the labor market effects of employer payroll taxes and wage subsidies

Who bears the burden of a payroll tax

- Effects on labor demand: Employees bear costs when government generates revenues through a payroll tax on employers
- Effects on labor supply: depends on amount of employer payroll tax that gets shifted to employee's wages
    - Less responsive labor supply to changes in wages: fewer employees who withdraw from market and higher proportion of tax that gets shifted to workers in the form of a wage decrease

Figure 5.4

The Market Demand Curve and Effects of an Employer-Financed Payroll Tax

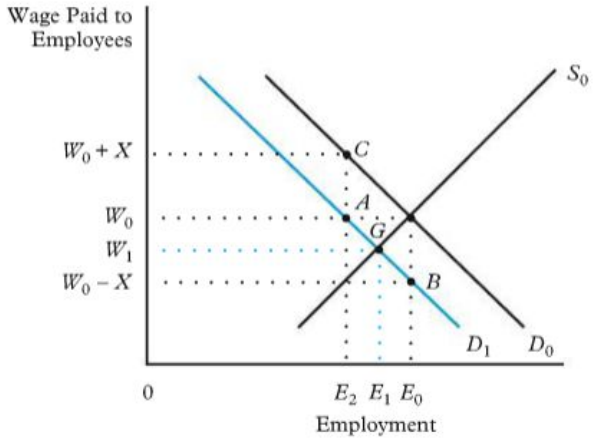
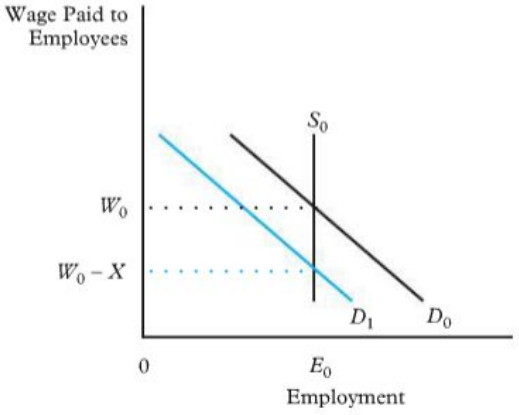


Figure 5.5

Payroll Tax with a Vertical Supply Curve



Employment subsidies as a device to help the poor

- Opposite of payroll tax
- Can be in form of cash payments or tax credits
- Credits may directly reduce firm's payroll-tax rate or reduce some other tax by amount proportional to number of labour hours hired. Credit has the effect of reducing the cost of hiring labor

Hiring subsidy programs:

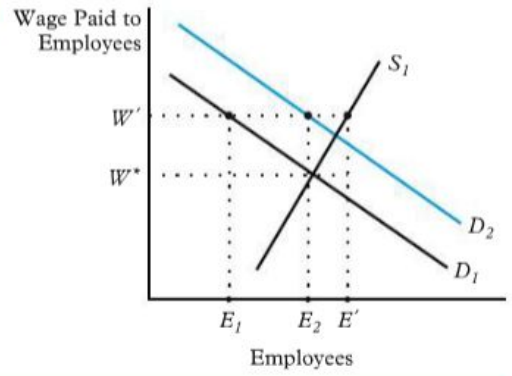
- General: not conditional on the characteristics of the people hired
- Selective (or targeted): makes the subsidy conditional on hiring people from certain target groups (disadvantaged)

Payroll tax cuts:

- Stimulates hiring
- Cutting payroll taxes during period when there is high unemployment can increase employment
- Reduce employer payroll tax = labor demand curve would shift right

Figure 5.6

Payroll Tax Reductions in a Period of Widespread Unemployment



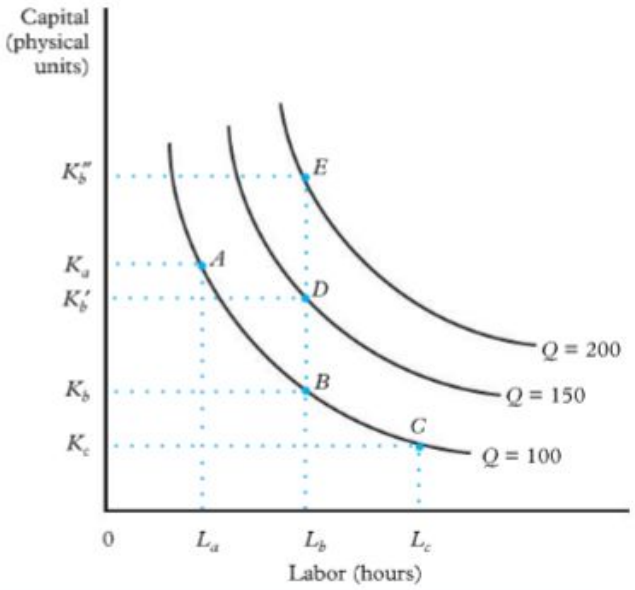
Appendix 5A: Graphical Derivation of a Firm's Labor Demand Curve

The Production Function: Q= A(L, K)

- Assuming that production is a function of combination of labor and capital, and the production curve is a convex curve at the given level of production Q.
- For instance, on the convex curve Q=100, any combination of capital and labor can produce a total output of Q=100. This curve is called isoquant. The isoquant has a negative slope, means that capital and labor could be substitutes to each other to maintain a certain production level.
- *Marginal rate of technical substitution:* the decrease in capital given an increase in labor while output is being held constant. Always negative because if L increases, K must be reduced to keep Q constant. $MRTS = \frac{\Delta K}{\Delta L} x \,|\overline{Q}$.

Figure 5A.1

A Production Function

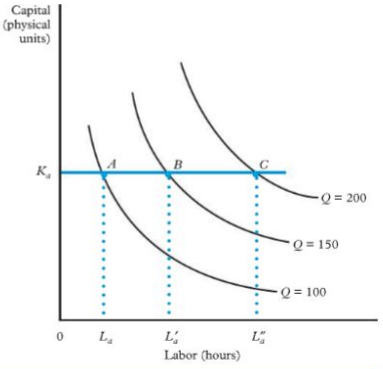


MRTS decreases as labor increases, **why?**

1) Demand for Labor in the Short Run : (meaning only labor changes, and capital is held constant)
    a) Profit max condition: $MPL = w/P$ (marginal product of labor equals to the real wage of labor) Where, marginal product of labor is the output added by the extra unit of labor, and the real wage represents the cost of an added unit of labor (in terms of output).
    - Therefore, labor demand curve in short run = MP_L schedule
    - Labor's marginal productivity declines because: With K fixed, each added worker has less capital with which to work

Figure 5A.2

The Declining Marginal Productivity of Labor



2) Demand for Labor in the Long Run: **conditions for cost minimization:**
    a) -On the iso-expenditure line AA', the cost of combination between the capital and labor equal to $1000, given the wage rate is $10 and capital cost per unit

is $20. You can regard this as the budget constraint to a firm. Similar to iso-expenditure line BB' CC'.

b) For a given isoquant Q*, to produce Q* level of production, the minimum costs can be generated at the tangent point between Q* and iso-expenditure lines (at wage level=$10 , and cost of capital per unit=$20). Meaning: to produce Q* level of production, the minimum costs to the firm is $1,500, where the firm hires Lz levels of labor and Kz levels of capital, Given that the wage rage=$10 and cost of capital per unit=$20. 3)

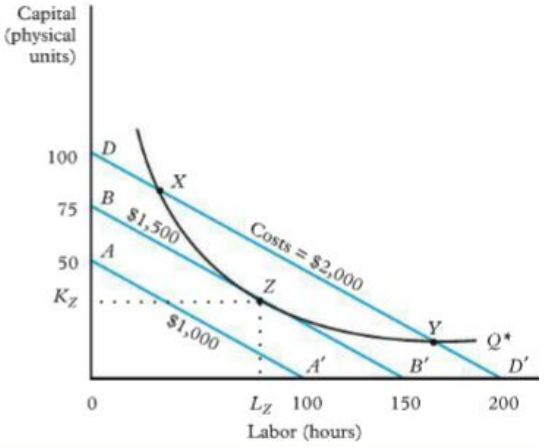
c) The Slope of the isoquant is MRTS between capital and labor:
   - $MRTS = \frac{-\Delta K}{\Delta Q} \div \frac{\Delta L}{\Delta Q} = -\frac{\Delta Q}{\Delta L} \div \frac{\Delta Q}{\Delta K} = \frac{-MP_L}{MP_K}$

d) The Slope of the iso-expenditure line is equal:
   - $Slope = -\frac{W}{C}$

e) The minimum-cost condition satisfy:
   - $MRTS = -MPL/MPK = -w/C$
   - Or $\frac{\Delta K}{\Delta Q} x\ C = \frac{\Delta L}{\Delta Q}$ x w

Figure 5A.3

Cost Minimization in the Production of Q* (Wage = $10 per Hour; Price of a Unit of Capital = $20)

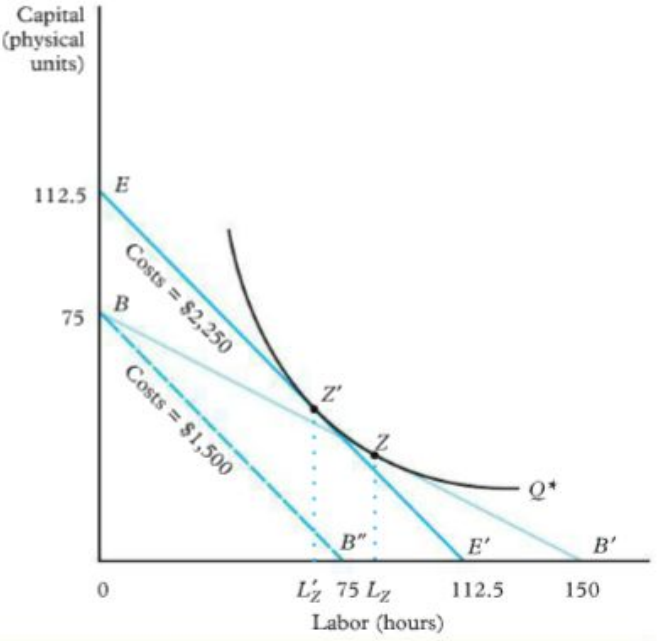


<u>The substitution effect:</u> generated by changes in wage

- For example if W goes from $10/hr to $20/hr: increase of cost of labor relative to capital induces firm to use more capital and less labor and point Z becomes Z'

Figure 5A.4

Cost Minimization in the Production of Q^* (Wage = \$20 per Hour; Price of a Unit of Capital = \$20)



The scale effect: changes in employment

- Results because usage of both K&L is cut back solely because of the reduced scale of production. Both effects (substitution and scale) are apparent when wages increase and capital prices remain constant
- Both effects lead us to conclude that the long-run labor demand slopes downward

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Chapter 6: supply of labor to the economy (the decision to work)

Demand for leisure is determined:

1. Opportunity cost of leisure (which is the wage rate)
2. Wealth
3. Personal preferences

Income effect: if **wage** is held constant, an ↑ **income** = ↑ **demand for leisure,** thereby ↓ **work incentives**.

It is negative = $\frac{\Delta H}{\Delta Y}|\overline{W} < 0$

- Changes in hours of work (Δ H)
- Produced by a change in income (Δ Y)
- Holding wages constant ($\overline{W}$)

Substitution effect: if **income** is held constant, an ↑ **wage rate** = ↓ **demand for leisure**, thereby ↑ **work incentives**. It is positive = $\frac{\Delta H}{\Delta Y}|\overline{Y} > 0$

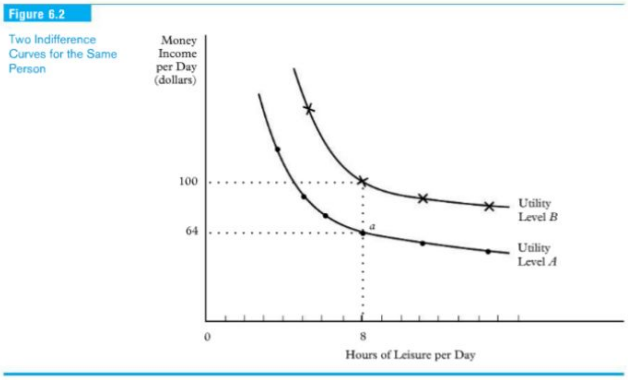
- Leisure and work = **substitutes**

Backward-bending: when income effect > substitution effect; as wage increases, labour supply decreases

Increase in wage: there are both income effect and substitution effect occurring at the same time. # of hours worked change is uncertain and is determined by which effect is **stronger**

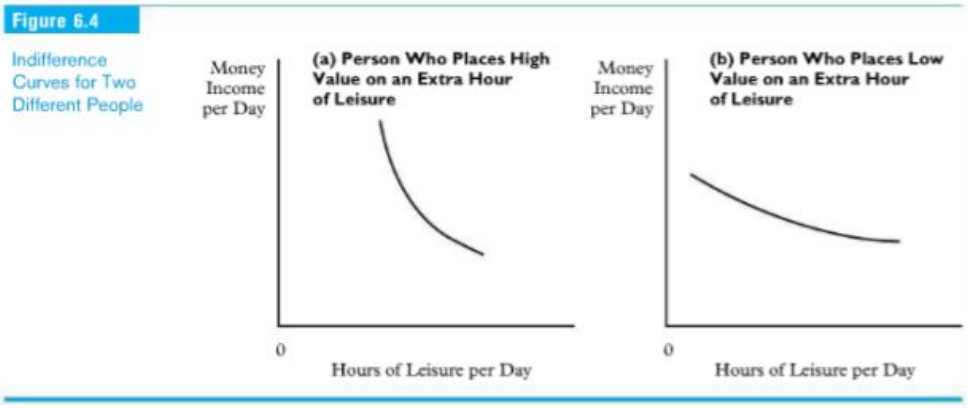
- Income effect: decrease in # hours worked
- Substitution effect: increase in # hours worked

Indifference curve of an individual: represents tradeoff between hours of leisure and money income a person can earn per day:



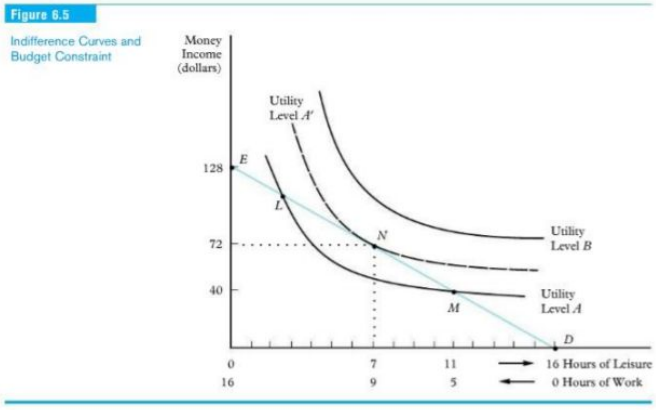
Indifference curve characteristics:

1. Utility level B represents more happiness than level A because every level of leisure consumption is combined with a higher income on B than A
2. **Do not intersect:** point of intersection would represent one combination of money income and leisure that yielded 2 different levels of satisfaction
3. **Negatively sloped:** if either income or leisure increase, the other is reduced in order to preserve consistent utility.
4. **They are convex** (steeper at the left than on the right). Reflects the assumption that **what is the most scarce is the most valued:**
    a. When money income is high & leisure hours are low, leisure is more valued than money
    b. When money income is low & leisure hours are high, money income is more valued than leisure
5. Indifference curves **depending on their preference for income or leisure:**
    a. Steep slope: person values leisure more than income
    b. Flat slope: person values income more than leisure



Budget constraint: total number of hours per day a person has (excluding time for sleeping and eating) to be allocated to work or leisure

- Indifference curve that is tangent to budget curve at point N represents **maximized utility**



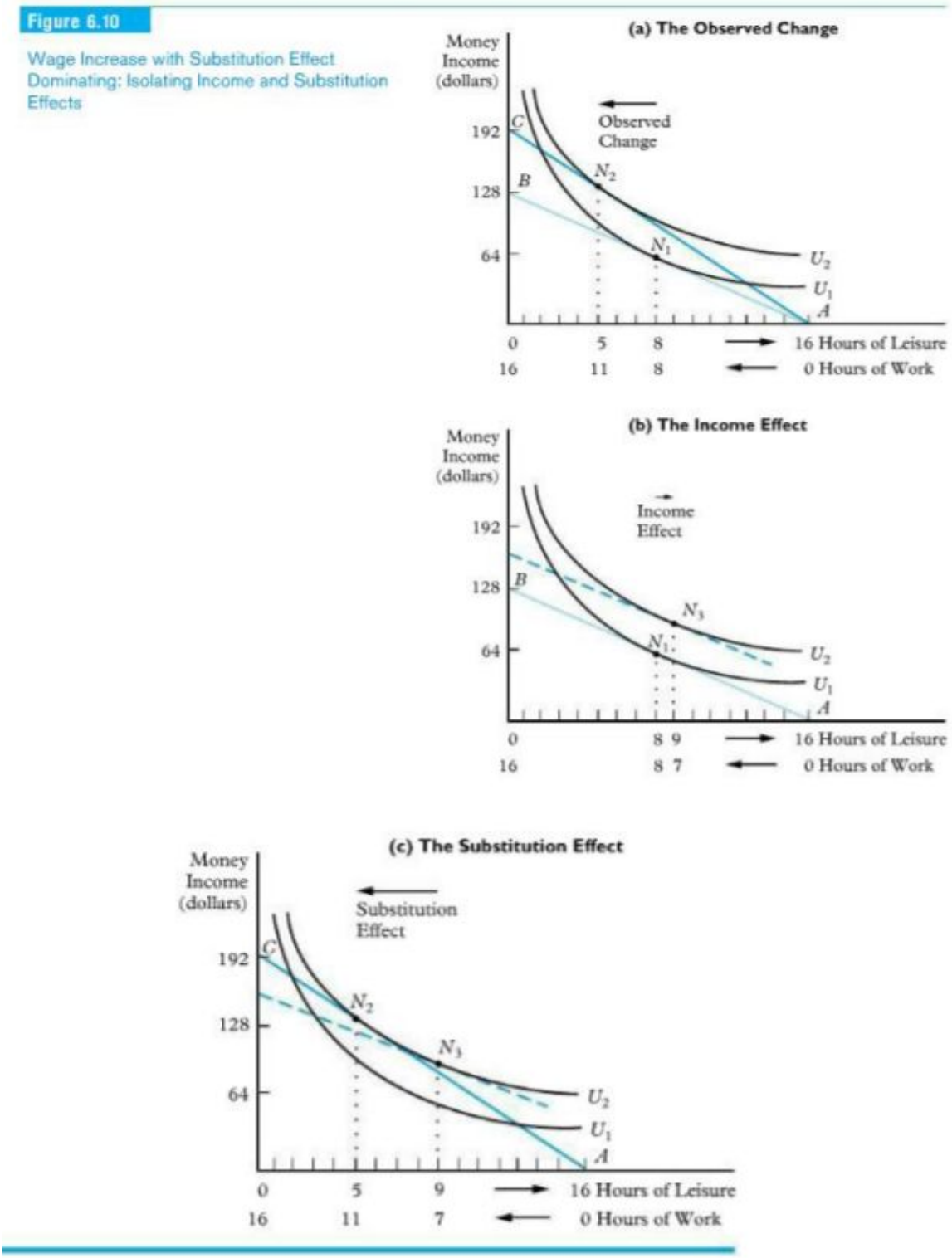
According to the above graph, the slope of the budget constrain is therefore the wage rate:

$$Slope = wage\ rate = \frac{\Delta Y}{\Delta H}$$

Substitution effect and income effect as a result of wage change & how to show both effects on the graph:

Figure 6.10

Wage Increase with Substitution Effect Dominating: Isolating Income and Substitution Effects



Chapter 7: Uncertainty and Consumer Behavior

Measures of risk:

1. Expected value: probability weighted average of the payoffs associated with all possible outcomes

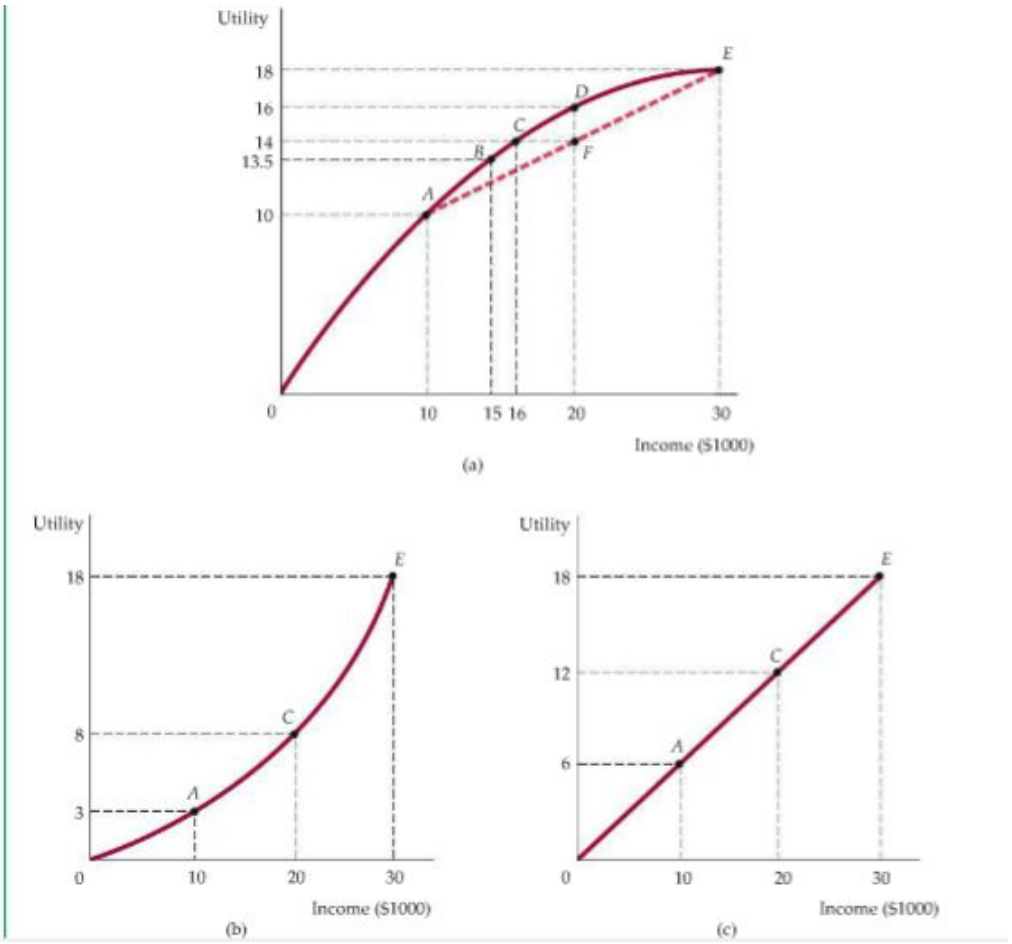
    - *Payoffs:* value associated with a possible outcome
    - $E(X) = Pr_1X_1 + Pr_2X_2.....Pr_nX_n$
2. Variability: extent to which possible outcomes of an uncertain event differ
    - *Deviation:* difference between expected payoff and actual payoff
    - *Standard deviation:* square root of the weighted average of the squares of the deviations of the payoffs associated with each outcome from their expected values
    - *Variance:* $\sum prob(x - ER)^2$

Utility: A utility function assigns a level of utility to each possible market basket

- **Marginal utility**: the additional satisfaction obtained by consuming an additional amount of a good
- **Expected utility:** sum of the utilities associated with all possible outcomes, weighted by the probability that each outcome will occur

Type of investors

- **Risk averse:** prefer a certain income to a risky income with the same expected value. Wants to the investment option with the least variability, square root function
    - Diminishing marginal utility as income increases
    - Will choose investment according to **highest expected utility**
- **Risk loving**: prefer a risky income to a certain income with the same expected value
    - Utility increases as income increases, exponential function
    - Will choose investment according to **highest expected utility**
- **Risk neutral:** indifferent between option 1 and option 2, **as long as the expected value is the same.** If option 1 has higher expected value then they will take option 1
    - Linear function: utility of income is constant
    - Will choose investment according to **highest expected value**



a) Risk averse
b) Risk loving
c) Risk neutral

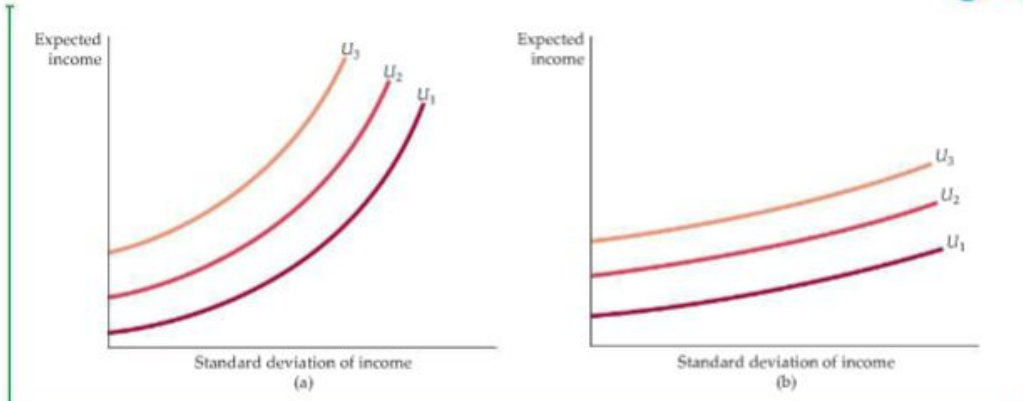


FIGURE 7.5
RISK AVERSION AND INDIFFERENCE CURVES

Part **(a)** applies to a person who is highly risk averse: An increase in this individual's standard deviation of income requires a large increase in expected income if he or she is to remain equally well off. Part **(b)** applies to a person who is only slightly risk averse: An increase in the standard deviation of income requires only a small increase in expected income if he or she is to remain equally well off.

Risk reduction techniques:

1. Diversification: allocating resources to a variety of activities whose outcomes are not closely related
    - *Negative correlated variables:* variables having a tendency to move in opposite directions
    - *Positively correlated variables:* variables having a tendency to move in the same direction
    - *Mutual fund:* organization that pools funds of individual investors buy a large number of different stocks or other financial assets
2. Pay premiums: Insurance→ protect your home
    - *Law of large numbers:* buy insurance from companies that specialize in selling it
    - *Actuarial fairness*: total premiums paid = total amount of money paid out
3. Have a lot of information: EV of choice with complete information − EV of choice with incomplete information

The investment portfolio: expected return on total portfolio (R_P) is a weighted average of the expected return on the 2 assets: $R_P = bR_m + (1 - b)R_f$

Standard deviation of the portfolio: fraction (weight) of the portfolio invested in the risky asset times the standard deviation of that asset: $\sigma_p = w\ x\ \sigma_m$

The investor's choice problem: to identify trade-off

Budget line = $R_p = R_f + b(R_m - R_f) = R_f + \frac{(R_m - R_f)}{\sigma_m} x \sigma_p$

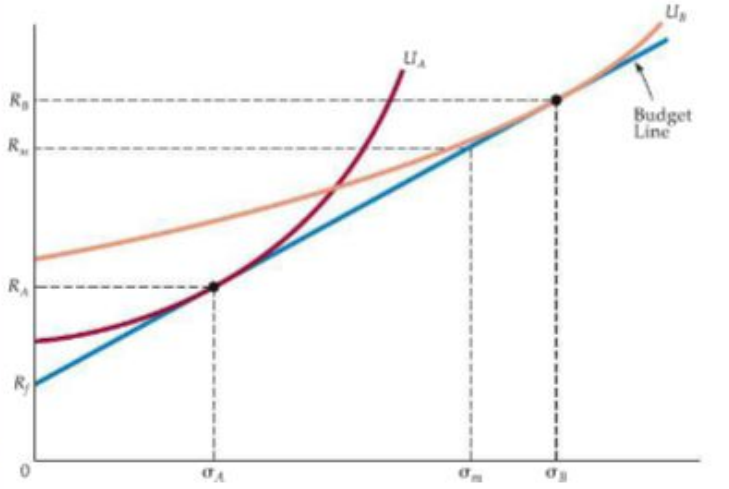
Price of risk: slope of the budget line ($\frac{(R_m - R_f)}{\sigma_m}$); extra risk that an investor must incur to enjoy a higher expected return

- $b = 0$ = no risk
- $b = 1$ = risk

Stocks on margin: borrow money from a brokerage firm in order to invest more than you actually own in the stock market (for risk lovers). More than 100% of the portfolio's value invested in stocks

FIGURE 7.8
BUYING STOCKS ON MARGIN

Because Investor *A* is risk averse, his portfolio contains a mixture of stocks and risk-free Treasury bills. Investor *B*, however, has a very low degree of risk aversion. Her indifference curve, U_B, is tangent to the budget line at a point where the expected return and standard deviation for her portfolio exceed those for the stock market overall. This implies that she would like to invest *more* than 100 percent of her wealth in the stock market. She does so by buying stocks *on margin*—i.e., by borrowing from a brokerage firm to help finance her investment.



Risk premium: the amount an individual is willing to pay to avoid a gamble

- Like an opportunity cost

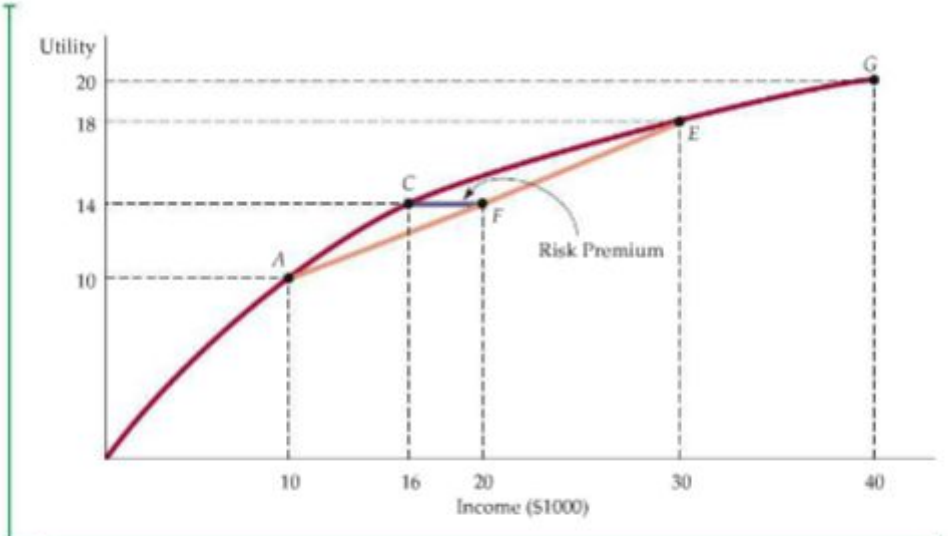


FIGURE 7.4
RISK PREMIUM

The risk premium, *CF*, measures the amount of income that an individual would give up to leave her indifferent between a risky choice and a certain one. Here, the risk premium is $4000 because a certain income of $16,000 (at point *C*) gives her the same expected utility (14) as the uncertain income (a .5 probability of being at point *A* and a .5 probability of being at point *E*) that has an expected value of $20,000.

Chapter 8: an Overview of the financial system

Maturity: of a debt instrument is the number of years (term) until the instrument expires

- Short-term: < 1 yr, Long-term: > 1 yr, Intermediate-term: 1-10 years

Equities: claims to the net income and assets of a company

Dividends: periodic payments from equities

Financial market: exist to connect borrowers and lenders, trading assets

Direct vs indirect finance:

1. Direct: borrower goes directly to the lender
2. Indirect: borrower and lender go through an intermediary. Most common
    a. Bank
    b. Mutual fund
    c. Exchange traded fund

Primary and secondary markets

1. Primary: new issues, objective is to raise capital
    - **Initial public offering (IPO)**: offer shares to public for the first time
    - **Investment bank:** assists in the initial offering of securities
    - **Underwriting:** investment bank guarantees a price for a corporation's securities and then sells them to the public
2. Secondary markets: old issues sold again
    - Can be organized in 2 ways:
        i. **Exchanges**: security buyers & sellers meet in one location to trade
            - The lemons problem: less severe for firms listed on exchanges (versus OTC) because they are typically larger corporations that are better known in the marketplace & it's easier for investors to get information and figure out whether the firm is of good quality or is a lemon. This decreases adverse selection
        ii. **Over the counter:** dealers at multiple locations who have an inventory of securities to buy and sell them to anyone who accepts their prices; doesn't go through the exchange
    - Securities brokers and deals are essential to a secondary market:
        i. Brokers: agents of investors who match buyers with sellers of securities
        ii. Dealers: link buyers and sellers by buying
    - Secondary markets 2 important functions:
        i. **Make financial instruments more liquid**: easier and quicker to sell financial instruments to raise cash
        ii. **Determine price of security:** that issuing firm sells in primary market

Money market vs capital market

1. Money market: short-term maturity investments which experience less price fluctuations and are therefore less risky.

- Types of debt instruments that are sold in money market:
    i. T-bills: issued to finance federal government
        - **Default:** issuing party is unable to make interest payments or pay off amount owed
        - **Currency:** government can issue currency or raise taxes to pay off t-bills
    ii. Certificates of deposit : sold by bank to depositors that pays annual interest and pays out at maturity
        - **Bearer deposit notes:** negotiable CDs, they can be traded
        - **Term deposit receipts/term notes:** non-negotiable CDs
    iii. Commercial paper: issued in either canadian dollars or other currencies by large banks and well-known corporations
        - **Finance paper:** promissory notes
    iv. Repurchase agreements: short-term loans for which T-bills serve as collateral
    v. Overnight funds: overnight loans between banks of their deposits with the bank of canada

2. Capital market: long-term debt securities. Types:
    - Stocks
    - Mortgages
    - Corporate bonds, Government of Canada bonds, Canada savings bonds, Provincial and municipal government bonds
    - Government agency securities
    - Consumer and bank commercial loans

Financial intermediary: the primary way for moving funds from lenders to borrowers

- Types of financial intermediaries:
    - **Depository institutions** (banks)
        - Chartered banks
        - Trust and loan companies
        - Credit unions and caisses populaires
    - **Contractual savings institutions**
        - life insurance
        - Property and casualty insurance companies
        - pension funds
    - **Investment intermediary**
        - Finance companies
        - Mutual fund
        - Money market mutual fund
        - Hedge funds
        - Investment banks

Importance of financial intermediary in financial markets:

- **Reduce Transaction costs:** the time and money spent in carrying out transactions
    - Economies of scale: reduction in transaction costs per dollar of transactions as the size of transactions increases
    - Liquidity services: make it easier for customers to conduct transaction
- **Reduce risk exposure**
    - Risk sharing: selling assets with risk characteristics that people are comfortable with and intermediaries then use funds to purchase other assets that may have more risk
    - Diversification
- **Solve asymmetric (not equal) information problems**: when one party's insufficient knowledge of the other party involved in a transaction makes it impossible for the first party to make accurate decisions when conducting the transaction. 2 types:
    - *Adverse selection:* occurs **before transaction**, when potential borrowers who are likely to produce adverse outcome are selected for approval
    - *Moral hazard:* happen **after the transaction,** risk (hazard) that borrower might engage in undesirable activities (immoral) from lender's point of view because they make it less likely loan will be paid back
        - Example: buy car insurance, you have a good driving record but you be more reckless after you buy car insurance
- **Economies of scope:** lower the cost of information production for each service by applying one information resource to many different services
    - Example: bank loaning money to a corporation can evaluate how good a credit risk the firm is which then helps the bank decide whether it would be easy to sell the bonds of this corporation to the public

Foreign bonds: bond sold in a foreign country but it is priced in the local currency

- Ex: Canadian government sells bond in the U.K but it is priced in GBP

Euro bonds: bond sold in foreign country but it is priced in another currency (other than home currency)

- Ex: U.S bond sold in Europe but it is priced in U.S dollars

Chapter 9: an economic analysis of financial structure

8 basic facts about the global financial system

1. Stocks are not the most important source of external financing for businesses
2. Issuing marketable debt and equity securities is not the primary way to finance businesses
3. Indirect finance is usually more important than direct finance
4. Financial intermediaries are important source of external funds to finance business
5. The financial system is one of the most regulated sectors of the economy

6. Only large, well established corporations have easy access to securities markets to finance their activities
7. Collateral is a common feature of debt contracts (both households and businesses)
8. Debt contracts are complicated legal documents that place large restrictions on behavior of borrower

Restrictive covenants: bond or loan contracts that restrict specific certain activities that the borrower might engage in

Collateral: property is pledged to lender as a guarantee payment if borrower can't pay back debt

Collateralized debt: "secured debt", is the predominant form of household debt and widely used in business borrowing too

Unsecured debt: credit card debt

Agency theory: analysis of how asymmetric information problem affect economic behavior

Tools to reduce adverse selection:

1. Private production and sale of information: private companies collect and produce information distinguishing firms and sell this information
    - **Free-rider problem:** occurs when people who don't pay for information take advantage of the information that others paid for
2. Government regulation to increase information
    - One option: government produces information free of charge but that would mean them releasing negative information about firms which can be difficult
    - Second option: government regulates securities markets in a way that encourages firms to reveal honest information about themselves
3. Financial intermediation: becomes an expert in producing information about firms so that it can sort out good credit risks from bad ones
4. Collateral and net worth:
    - **Collateral:** reduces the lender's losses in the event of default
    - **Net worth**: lender can take title of firm's net worth & sell it off to recover some of the losses from the loan

Principal-agent problem: when one person or entity (the agent = manager) is able to make decisions or take action on behalf of another person or entity (the principal = stockholders)

- Arise in equity contracts from moral hazard: managers (agents) may act in their own interest rather than in the interest of the stockholder (principal) because they have less incentive to maximize profits than stockholders do

How to reduce principal-agent problem:

- Monitoring: audit firm's activities. Can be expensive (time & money), also known as **costly state verification**
- Government regulation to increase information
- Financial intermediation
- Debt contracts: contractual agreement by borrower to pay lender fixed dollar amounts at periodic interval leads to less frequent need to monitor firm and thus lower cost of state verification

Venture capital firm: pool resources of their partners and use the funds to help build entrepreneurs to start new businesses

Reducing moral hazard in debt contracts:

- Net worth and collateral: Make debt contract **incentive-compatible** as in it aligns the incentives of the borrower with those of the lender
- Monitoring and enforcement of restrictive covenants: reduce moral hazard by discouraging undesirable behavior or encouraging desirable behavior
- Financial intermediation:Can avoid free-ride problem by making private loans which are not traded so no one else can free-ride on the intermediary's monitoring and enforcement of the restrictive covenants. The intermediary receives full benefits of monitoring and enforcement and will work to shrink the moral hazard problem inherent in debt contracts

Chapter 10: The meaning of interest rates

Present value (present discounted value): a dollar in one year is less valuable that a dollar paid today because it can earn interest in a savings account (money loses value in the future)

$PV = cash\,flow \div (1+i)^n$

Simple interest: $i = principal\ x\ (1+i)^n$

4 types of credit market instruments:

1. **Simple loan:** must be repaid at maturity along with additional interest charges
2. **Fixed-payment loan** (fully amortized loan): same payment (interest + principal), every period for set number of years
3. **Coupon bond:** fixed-interest payment (coupon payment) every year until maturity date, when a specified final amount (face value or par value) is repaid.
    - **Par:** YTM = CR
    - **Premium:** YTM < CR
    - **Discount bond:** YTM > CR

4. **Discount bond (zero-coupon bond):** bought a price below its face value and then face value is repaid at maturity & does not make any interest payments

Yield to maturity: interest rate that equals the present value of cash flow payments received from a debt instrument with its value today.

Return (or rate of return): amount of each payment to the owner plus the change in the security's value, expressed as a fraction of its purchase price = nominal rate

Sensitivity and bonds:

1. Longer maturity = more interest rate risk
2. Rise in interest rates = fall in bond prices

Nominal interest rate: interest rate that does not consider inflation

Real interest rate: adjusted to inflation

Chapter 11: The Behavior of interest rates

Theory of portfolio choice: how much of an asset you want to hold in your portfolio

Factors that affect demand for bonds

Factors	Effect	Δ*demand bonds*	Δ*equil price*	Δ*interest rate*
Wealth	↑	↑ (right shift)	↑	↓
Expected return	↑	↑ (right shift)	↑	↓
Risk	↑	↓ (left shift)	↓	↑
Liquidity	↑	↑ (right shift)	↑	↓

Factors that affect supply for bonds

Factors	Δ*in factor*	Δ*supply of bonds*
Profit from investment	↑	↑ (right shift)
Expected inflation	↑	↑ (right shift)
Government deficit	↑	↑ (right shift)

Liquidity preference framework: supply and demand for money

Factors that affect money supply & money demand

Factor	Effect	Δ*curve* (M_S / M_d)	Δ*interest rates*
Liquidity (money supply)	↑	M_S ↑	↓
Income	↑	M_d ↑	↑
Price-level (inflation) you need more money to buy the same thing	↑	M_d ↑	↑

Asset market approach: Emphasizes stocks of assets rather than flows in determining asset prices.

Movement along a demand/supply curve: when quantity demanded or supplied changes as a result of a change in the price of bond or in interest rate

Shifts of demand/supply curve: occurs when the quantity demanded or supplied changes at each given price (or interest rate) of the bond in response to a change in some other factor besides price or interest rate

Interest rate is **negatively** related to bond price. If equilibrium bond price rises, then interest rate falls, and vice versa.

Opportunity cost: amount of interest (expected return) sacrificed by not holding the alternative asset (bond)

- As interest rate on bonds rises, the OC of holding money rises thus money is less desirable and quantity of money demanded falls

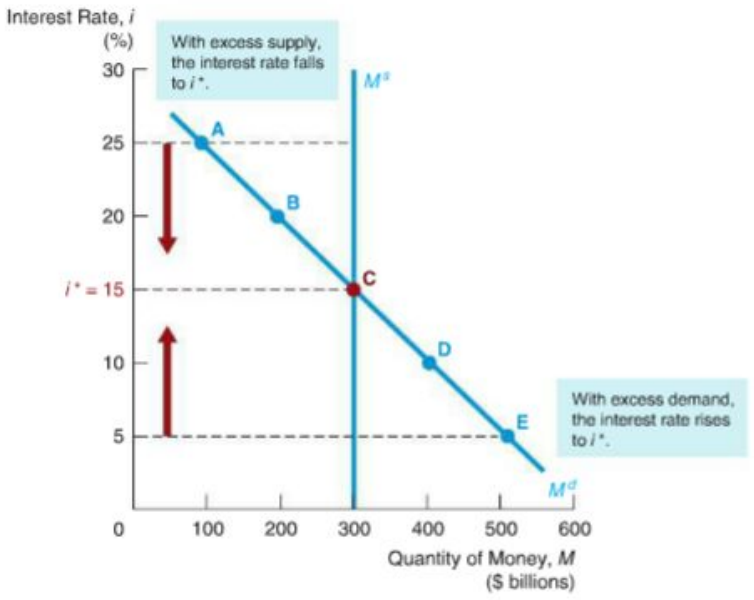


FIGURE 11-8 Equilibrium in the Market for Money

Equilibrium in the market for money occurs at point C, the intersection of the money demand curve M^d and the money supply curve M^s. The equilibrium interest rate is $i^* = 15\%$.

CHAPTER 12: THE RISK AND TERM STRUCTURE OF INTEREST RATES

RISK STRUCTURE OF INTEREST RATES:

Risk structure of interest rates: Relationship among interest rates on bonds with same times to maturity

- Default risk: issuer of bonds is unable/unwilling to make interest payments/face value
  - Default-free bonds: bonds with no default risk (canadian government bonds)
  - Risk premium: spread between interest rates on bonds with default risk and interest rates on default-free bonds both of the same maturity
    - A bond with default risk will always have a positive RP
    - Increase in default risk = increase RP = Positive relationship
  - Credit-rating agencies: investment advisory firms, rates quality of corporate and municipal bonds in terms of probability of default
    - Investment-grade securities: bonds will **low risk of default** and have a rating of Baa or BBB and above
      - *Fallen angels*: investment-grade securities whose rating has fallen to junk levels
    - Junk bonds: have **higher default risk** and also referred to as high-yield bonds, ratings below Baa or BBB
- Liquidity: the more liquid an asset is, the more desirable

- Income tax consideration: if a bond has a favorable tax treatment (municipal bonds in the USA) whose interest payments are exempt from income taxes, its interest rate will be lower

Note: the difference between the interest rates on corporate bonds and Canada bonds (risk premiums) reflect the corporate bond's default risk and also its liquidity

TERM STRUCTURE OF INTEREST RATES

Term structure of interest rates: Relationship among interest rates on bonds with different times to maturity

- Yield curve: a plot of the yields on bonds with differing terms to maturity but the same risk, liquidity, and tax considerations. Describes the term structure of interest rates for particular types of bonds. Yield curves can be classified as:
    - Upward-sloping: long-term interest rates are above short-term interest rates
    - Flat: short and long-term interest rates are the same
    - Downward-sloping: long-term interest rates are below short-term interest rates
- 3 empirical facts:
    - Interest rates on bonds of different maturities move together over time
    - Short term interest rates:
        - Low: yield curves = upward slope
        - High: yield curves = downward & inverted
    - Yield curves almost always slope upward
- Three theories explain the term structure of interest rates
    - Expectations theory
    - Segmented markets theory
    - Liquidity premium theory

1. **Expectations theory:** the interest rate on a long-term bond will equal an average of short-term interest rates that is expected to occur over life of long-term bond
    a. Explains first 2 facts well, but not the third
        i. First fact: interest rates on bonds with different maturities move together over time
            - Rise in short-term interest rates will (1) increase expectations of future higher short-term rates & (2) because long-term rates are the average of short-term rates, a rise in short-term will also rise long-term rates, causing them to move together
        ii. Second fact: yield curves tend to have an upward slope when short-term interest rates are low & downward slope when they're high
            - Low interest rates are expected to increase to a normal level in the future and average of expected short-term rate is high relative to current short-term rate. Long-term interest rates will

be above current short-term rates and yield curve will have an upward slope
- Also explains, if interest rates are mean-reverting, then long-term interest rate is less volatile than short-term

iii. Third fact: cannot support

b. Assumption: bond buyers don't prefer bonds of one maturity over another & based their decision on expected return
   i. Bonds that have these characteristics = perfect substitutes
   ii. Therefore expected return must be equal

c. $i_{nt} = \frac{i_t + i^e_{t+1} + i^e_{t+2} + \ldots i^e_{t+(n-1)}}{n}$
   i. Equation: states that the n-period interest rate equals the average of the one-period interest rates to occur over the n-period life of the bond

2. Segmented markets theory
   a. Bonds of different maturities are **not substitutes** and therefore their expected return will have no effect on each other
   b. Cannot explain first 2 facts
   c. Can explain fact 3: yield curves slope upward, because long-term bonds demand is usually lower than for short-term bonds, since they have lower prices and higher interest rates

3. **Liquidity premium theory:** the interest rate on a long-term bond will equal an average of short-term interest rates expected to occur over the life of the long-term bond plus a liquidity premium (also known as *term premium)* that responds to supply and demand conditions for that bond
   a. Bonds of different maturities are **substitutes** and their expected return will influence each. However they are **not perfect substitutes.** Investors tend to prefer shorter-term bonds (less interest-rate risk) & should be offered a positive liquidity premium to hold longer-term bonds
   b. Liquidity premium is written as: $i_{nt} = \frac{i_t + i^e_{t+1} + i^e_{t+2} + \ldots i^e_{t+(n-1)}}{n} + l_{nt}$
      i. l_{nt} = liquidity (term) premium for the n-period bond at time t which is always positive and rises with the term to maturity of the bond *n*
   c. Explains all 3 facts
   d. Helps predict movement of short-term interest rates in the future
      i. **Steep** slope of yield curve = short-term rates are expected to rise
      ii. **Mild upward** slope = short-term rates are expected to remain the same
      iii. **Flat** slope = short-term rates are expected to fall moderately
      iv. **Inverted** slope = short-term rates are expected to fall sharply

4. **Preferred habitat theory: r**eaches the same conclusion at the LPT
   a. Investors have preference for a particular bond maturity (preferred habitat) in which they prefer to invest
   b. Willing to hold:

i. Bonds that don't have preferred maturity (habitat) if they offer higher expected return
ii. Long-term bonds if they have higher expected returns but prefer short-term bonds

Forward rate: is the one-period interest rate that the pure expectations theory of term structure indicates is expected to prevail one period in the future (rate you are expected to receive)

$$i^e_{t+1} = \frac{(1+i_{2t})^2}{1+i_t} - 1$$

1. Forward rate *n* periods into the future: $i^e_{t+n} = \frac{(1+i_{n+It})^{n+1}}{(1+i_{nt})^n} - 1$
2. Liquidity premium forward rate
$$i^e_{t+n} = \frac{(1+i_{n+It}-l_{n+1t})^{n+1}}{(1+i_{nt}-l_{nt})^n} - 1$$
3. Adjusted forward-rate forecast
$$i^e_{t+1} = \frac{(1+i_{2t}-l_{2t})^2}{1+i_t} - 1$$

Spot rates: actual, observed interest rates (one you get on the spot & know for sure)

CHAPTER 13: INTRODUCTION TO WORLD ECONOMY

INTRODUCTION: INTERNATIONAL ECONOMIC INTEGRATION

- 2007: crisis in housing sector of U.S (mortgage crisis)
- Scarcity of credit: businesses could not finance their activities & cut down on investments, consumers cut down on spending
- By the end of 2008: economies around the world were in recession
- International integration of national economies
    - Pros: technological innovation, less expensive products, and greater investment in regions where local capital is scarce
    - Cons: Made countries vulnerable to economic problems that are easily transmittable

ELEMENTS OF INTERNATIONAL ECONOMIC INTEGRATION

Historical measures of international economic integration with data on trade, capital flows and migration

- 1950s: economic integration began (reduction in trade barriers after world war II)
- 1970s: openness of capital markets
- 1990s: advent of the internet & other telecommunication revolutions increase economic integration to whole new level
- **4 measures to evaluate degree of economic integration:**
    - Trade flows
    - Capital flows
    - People flows
    - Similarity of prices in separate markets: price differences that are relatively small and due mainly to transportation costs

Trade-to-Gdp ratio: $(exports + imports) \div GDP$

- Measures relative importance of international trade
- Does not tell us about country's trade policies or barriers
- Smaller countries tend to have higher ratios than large countries who are less dependent on international trade

Capital and labor mobility

- The more interdependent national economies are, the more labor and capital should easily across international boundaries
- Labor is less mobile than in 1900
- Capital measure is more difficult
    - Most basic distinction is between **flows of financial capital** representing **paper assets** such as stocks, bonds, currencies, bank accounts, and **flows of capital representing physical assets** such as real estate, factories and businesses
    - Foreign direct investment: the latter type of capital flow
- Comparing capital flows today to a century ago, there are 3 main points:
    - Savings and investment are highly correlated: high savings = high rates of investment
    - The role of foreign exchange transactions has changed: many firms today protect themselves from sudden shifts in currency values
    - Costs of foreign financial transactions have fallen significantly

3 factors in the world economy today that are different from the economy at the end of the first wave of globalization

1. **Deeper integration:** negotiations over domestic policies that impact international trade
    - High-income countries have low barriers to imports of manufactured goods
    - Import tariffs & quotas are much less restrictive than they were back in the day
        i. *Shallow integration:* reduction of tariffs and elimination of quotas

- 2 main trends emerged from this:
    i. Lower trade barriers demonstrated that most countries have domestic policies that impede international trade
    ii. Technologically complicated goods (smartphones, cars) are made of parts produced in more than one country and labels such as "made in china" are less and less meaningful

2. **Multilateral organizations:**
    - International monetary fund (IMF)
    - World bank
    - General agreement on tariffs and trade (GATT)
    - United nations (UN)
    - World trade organization (WTO)
3. **Regional trade agreements:** (RTAs) is what is new; the use of RTAs has significantly increased in the last 20 years

3 types of evidence that trade supports economic growth

1. Causal empirical evidence of **historical experience**
2. Evidence based on **economic models and deductive reasoning**
3. Evidence from **statistical comparisons of countries**

12 themes in international economics

1. Gains from trade and new trade theory
2. Wages, jobs, and protection
3. Trade deficits
4. Regional trade agreements
5. Resolution of trade conflicts
6. Role of international institutions
7. Exchange rates and the macroeconomy
8. Financial crises and global contagion
9. Capital flows and the debt of developing countries
10. Latin america and the world economy
11. Export-led growth in east asia
12. China and india in the world economy

CHAPTER 14: COMPARATIVE ADVANTAGE & GAINS FROM TRADE

Gains from trade: the improvement in national welfare is known as the gains from trade

Mercantilism: the system of nationalistic economics that stressed exports over imports to obtain revenues for building armies and national construction projects

- **Key mistake**: belief that trade was a *zero sum activity* which means that one nation's gain is another nation's loss

Ricardian model: Assumes that there are only 2 countries, producing 2 goods, using one input (labor)

- *Productivity (ricardian model):* the amount of output obtained from a unit of input: *units of output ÷ hours worked*

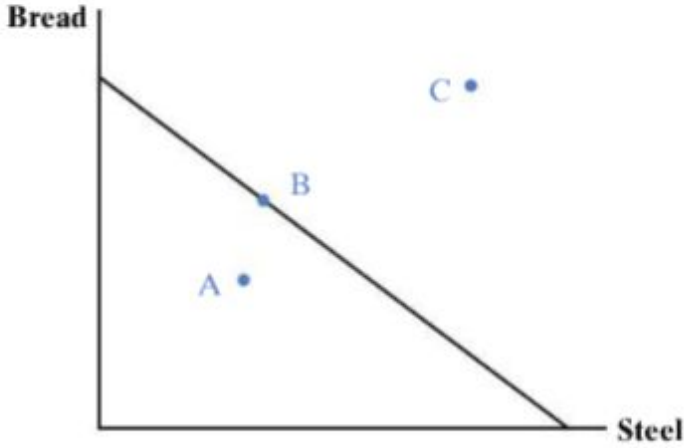
elements	Assumptions of ricardian model
Labor	● The only input ● Immobile across borders ● Mobile between sectors ● Fully employed
Markets	● Two outputs ● Perfect competition (firms are price takers) ● No transportation or trade costs
Technology	● Constant returns to scale ● No changes in technology or skills

COMPARATIVE PRODUCTIVITY ADVANTAGE & GAINS FROM TRADE

The product possibilities curve (PPC): trade-offs country faces when it chooses its combination of bread and steel output. Linear, because it is assumed that the trade-off between bread and steel does not change. Assumes labor is homogeneous and that no group of workers is more skilled than another group

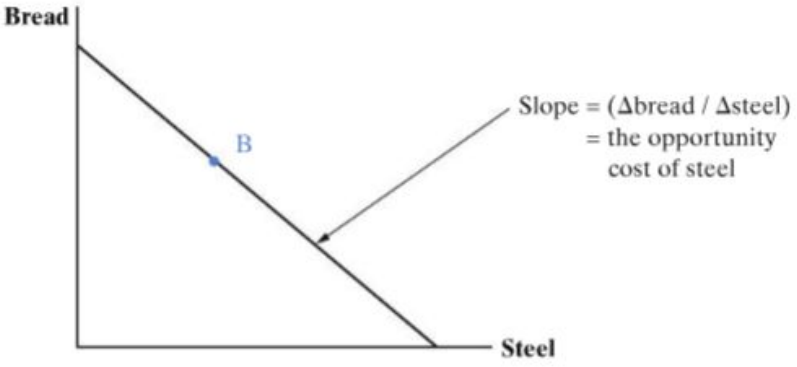
- **Point B on PPC**: efficient point of product because it utilizes existing resources to obtain the maximum possible level of output
- **Point A on PPC:** the economy is inside its production curve and is operating inefficiently and wasteful level of output because it's not obtaining maximum possible output from available inputs
- **Point C on PPC:** is infeasible because not enough resources

FIGURE 14.1 **A PPC for the United States**



In a model with only two goods, the production possibilities curve shows the trade-offs.

FIGURE 14.2 **Opportunity Costs and the Slope of the PPC**



The slope of the PPC is the opportunity cost of the good on the horizontal axis. This follows from the definition of the slope as the ratio of the vertical change to the horizontal change moving along the PPC.

States gives up two-thirds of a loaf of bread. In Figure 14.2, the slope of the PPC is −0.67, the number of loaves of bread forgone (Δbread) divided by the quantity of steel obtained (Δsteel)—written as follows:

$$\text{Slope of the PPC} = (\Delta\text{bread output})/(\Delta\text{steel output}) = \text{opportunity cost of steel}$$

Relative prices: the trade-off (opportunity cost of steel). In units of the other good (not in money). If no trade takes place, relative price of a good must equal to its opportunity cost of production

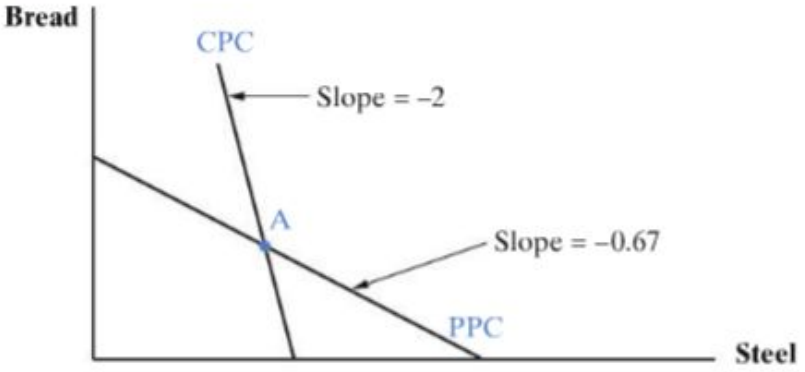
- Example: if slope = -0.67, then if US does not trade the give up 0.67 loaves of bread for an additional ton of steel

- Relative price of steel can convert to relative price of bread by taking inverse of the price of steel
    - Example: 0.67 loaves of bread is the price of 1 ton of steel, ten 2.5 tons of steel is the price of 1 loaf of bread. 1.5 tons of steel is the OC of 1 loaf of bread

The consumption possibilities curve: the slope of CPC (negative) is the relative price of steel or the rate at which bread and steel can be traded for each other

- *Autarky:* complete absence of trade and is the situation both the US & Canada are limited in their consumption to the goods that they produce at home
- Gains from trade will occur if the price settles between the OC in Canada and in the US. The countries benefit if the following is true: 3 (loaves/ton) > P_W^S >0.67 (loaves/ton)

FIGURE 14.3 **Production and Trade Before Specialization**



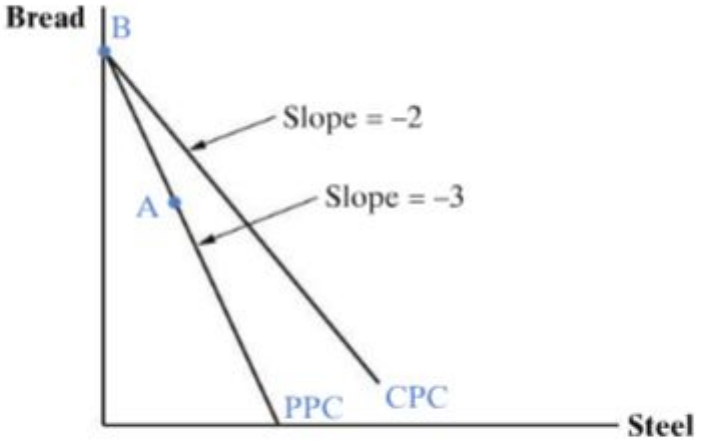
If the United States produces at A and the trade price of steel is 2, then it can trade steel for bread and move its consumption bundle outside its PPC.

The gains of trade:

- **Point A:** pre-trade production point & consumption point b/c in absence of trade, consumption = production.
    - Any combo of bread & steel available along PPC or CPC if the US produces at A & trades, there is a consumption bundle on CPC' which represents more of both goods
- **Point B:** represents production that is completely specialized in steel
    - If trade opens: production could occur at B & US could trade up along CPC' & it can reach a point like C, which is superior to consumption bundle available at point A because it represents more bread & steel
    - Maximizes U.S income b/c acquires greatest combo of bread and steel

A numerical example will help clarify the existence of gains from trade. Suppose the relative price of steel is 2 loaves per ton. When the United States increases its steel output by 1 ton, it gives up 0.67 loaves of bread output, but it can trade the steel for 2 loaves, leaving a net gain of 1.33 loaves (2 − 0.67 = 1.33). In order to meet U.S. demand for 2 more loaves of bread, Canada must give up 0.67 ton of steel production. It trades the 2 loaves for 1 ton of steel, however, leaving a net gain of 0.33 ton (1 − 0.67 = 0.33). Hence, both countries benefit from the trade.

FIGURE 14.5 Canada's Gains from Trade



By specializing production at B and trading for steel, Canada obtains the largest possible consumption bundle.

Domestic prices and the trade price

- As long as trade price is between pre-trade domestic price in Canada and US, both countries can gain from trade. (3 (loaves/ton) > P_W^S >0.67) 2 other extreme cases:
  - First case: 3 (loaves/ton) < P_W^S = 4 > 0.67
    - Trade price of steel is greater than the production cost in each country
    - US: wants to continue to specialize in steel & trade it for bread
    - Canada: higher price of steel makes it profitable for canadian producers to switch to steel production
    - Bread shortage and glut of steel
    - Bread price rices, steel prices fall: goes on until trade price of steel falls below OC of production in Canada
    - Once P_W^S < 3: Canadian producers switch back to bread, steel production goes down, bread is up and trade resumes
  - Second case: 3 (loaves/ton) > P_W^S = 0.5 < 0.67
    - Trade price of steel is lower than production cost in each country
    - Canada continues to specialize in bread, US switches
    - Bread is a surplus good, shortage in steel
    - Trade price = opportunity cost in one country

        - Trade price of steel = 0.67 loaves/ton, then US = Indifferent about trading (all gains go to Canada)
        - Trade price of steel = Canada OC, then Canada = indifferent (all gains go to US)
    - The trade price depends on strength of demand for each good in both countries
    - Both countries benefit if the price is between the two opportunity costs

ABSOLUTE AND COMPARATIVE PRODUCTIVITY ADVANTAGE CONTRASTED

Absolute productivity advantage: defined as having higher labor productivity

Comparative productivity advantage: if opportunity costs of producing a good are lower than those of its trading partners.

GAINS FROM TRADE WITH NO ABSOLUTE ADVANTAGE

- This case illustrates a fundamental principle: what matters most for the purposes of trade is not a country's absolute advantage, but rather its **comparative advantage**

Consider the case shown in Table 14.3. Japan has an absolute advantage in both cars ($2 > 0.5$) and steel ($2 > 1$), yet it can still gain from trade, as can Malaysia, even though it lacks an absolute advantage in either good. If Japan does not trade, it is limited to its own production possibilities, which require it to give up 1 ton of steel for each car it produces. In Malaysia, each car costs 2 tons of steel. Hence, there is scope for a mutually beneficial exchange.

Japan's opportunity cost of steel production is greater than Malaysia's even though it has a higher absolute rate of productivity in steel. Therefore, if it follows its comparative advantage and maximizes its income, it will specialize in cars, the sector where its opportunity cost is lower than Malaysia's. Once trade opens, the world price of cars will be between 1 and 2 tons of steel per car, the opportunity costs of production in Japan and Malaysia, as follows:

$$1\left(\frac{\text{tons}}{\text{car}}\right) < P_w^e < 2\left(\frac{\text{tons}}{\text{car}}\right)$$

Let the price be 1.5 tons of steel per car. If Japan moves to specialize in cars with the opening of trade, it gives up 1 ton of steel for each additional car it produces. With the additional car, it can trade for 1.5 tons of steel, which is a net gain of 0.5 tons over its own production. Similarly, Malaysia gives up 0.5 cars produced for each additional ton of steel it manufactures, but it gains 0.67 cars from each ton of steel traded. Both countries benefit and are able to consume a greater amount of both goods than they could if they relied on their national production alone.

TABLE 14.3 Output per Hour Worked

	Japan	Malaysia
Cars	2	0.5
Steel	2 tons	1 ton

Competitive advantage: results from productivity differences between nations in autarky

ECONOMIC RESTRUCTURING

Economic restructuring: changes in the economy that may require some industries to grow and others to shrink or disappear altogether.

Trade adjustment assistance (TAA): programs that take the form of extended unemployment benefits and worker retraining

CHAPTER 15: EXCHANGE RATES AND EXCHANGE RATE SYSTEMS

EXCHANGE RATES AND CURRENCY TRADING

Exchange rate: is the price of one currency stated in terms of a second currency.

- Can be given in one of two ways: Units of domestic currency per unit of foreign currency or vice versa
- *Flexible exchange rates:* subject to constant fluctuations up and down in value (euro, yen, gbp)

Reasons for holding foreign currencies:

1. **Trade and investment purposes**
2. **Interest rate arbitrage:** buying something when it is cheap and selling it when it is expensive; borrow when interest rates are low and lend when they're high
3. **To speculate:**
    - *Speculators*: businesses that buy/sell currency because they expect its price to rise or fall

Institutions:

- 4 main participants in foreign currency markets:
    1. **Retail customers:** firms/individuals, hold foreign exchange for any of the 3 reasons stated
    2. **Commercial banks**: most important; hold inventories of foreign currencies as part of the services offered to consumers
    3. **Foreign exchange brokers:** middlemen between buyers and sellers that do not usually hold foreign exchange. Can also serve as agents for central banks
    4. **Central banks**

Exchange rate risk: currencies are constantly changing in value as a result future payments that will be made/received in a foreign currency will be a different domestic currency amount from when the contract was signed

- Tools to resolve:
    - **Forward exchange rate:** is the price of a currency that will be delivered in the future

Forward market: buyer and selling of currencies for future delivery takes place

- Important to financial investors and speculators as well as exporters and importers because they provide:
    - Heading: buying a forward contract to sell foreign currency at the same time that the bond or other interest-earning asset matures
    - Covered interest arbitrage: insure against exchange rate risk known as covered interest arbitrage

Spot market: the market for buying and selling in the present

SUPPLY & DEMAND FOR FOREIGN EXCHANGE

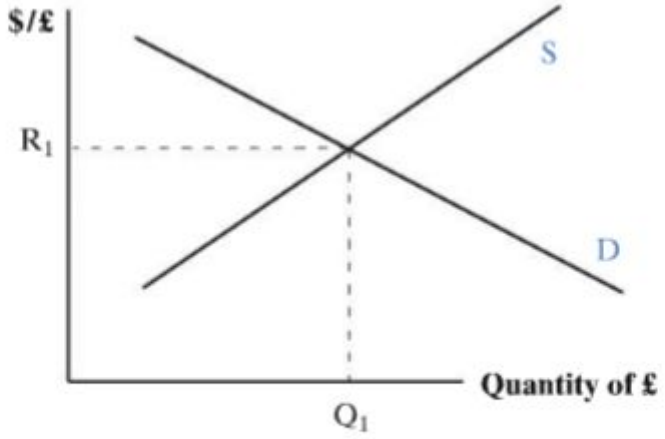
Appreciation vs. depreciation:

- *Appreciation:* an increase in demand for the dollar will raise its prices
- *Depreciation:* an increase in supply will lower its price

Supply and demand with flexible exchange rates

- Demand: downward sloping = as the pound depreciates relative to the dollar, the quantity of pounds demanded by Americans increases
    - Increase in the exchange rate (R) = decline in value of the dollar
    - Movements up vertical axis: represent increase in price of pound which = fall in price of dollar
    - Movement down vertical axis: represent decrease in price of pound
- Supply: upward sloping = british firms and consumers are willing to buy a greater quantity of american goods as dollar becomes cheaper
    - Increase in quantity of american goods demanded = increase in quantity of foreign currency supplied to US
- Intersection of S&D: determines market exchange rate and quantity of pounds supplied to the US
- At R_1: The demand and supply of british pounds to the US is Q_1

FIGURE 15.2 **Supply and Demand in the Foreign Exchange Market**



The intersection of the supply of British pounds to the U.S. market and the U.S. demand for British pounds determines the quantity of pounds available in the United States (Q_1) and their dollar price (exchange rate R_1).

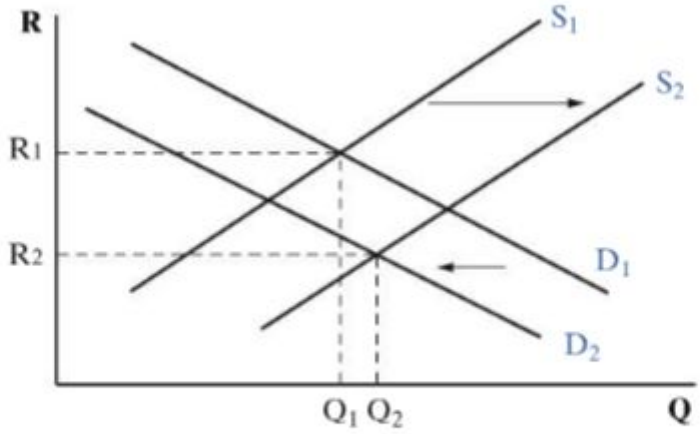
Exchange rates in the long run: Assumes exchange rates are flexible

- Demand:
  - Increase in U.S demand for pound = rise in exchange rate & appreciation in the pound, depreciation in the dollar
  - Fall in U.S demand for pound = decrease in exchange rate & depreciation in the pound, appreciation in the dollar
- Supply:
  - Increase in supply of pounds to U.S market = lower exchange rate and appreciated dollar
  - Decrease in supply of pounds to U.S market = higher exchange rate and depreciated dollar
- Causal factors behind shifts in S&D are easier to understand if we divide the determinants of exchange rates into 3 periods:
  - Long run:
    - Purchasing power parity states that the equilibrium value of exchange rate is at the level that allows a given amount of money to buy the same quantity of goods abroad that it will buy at home. Therefore, equilibrium exchange rate is the point where dollar buys pounds at a rate that keeps its purchasing power over goods and services constant.
    - Purchasing power parity in long run exerts influence over exchange rates (not in short or medium run)
    - PPP: influences currency values indirectly. When currency is under or overvalued, it creates profit-making opportunities for merchants that can move goods across international borders
    - PPP assumptions:

- Requires that goods flow costlessly across international borders and that all goods and services can be traded
- Merchants pays a fee to a bank or a currency broker when buying the needed pounds
- Some of the goods and services bought and sold are never traded and arbitrage is not possible

- Medium run
  - Demand: Strength of a country's economic growth: rapid growth = increased imports, increase in demand for foreign currency & vice versa (for recession or slower growth)
  - Supply: rapid growth abroad leads to more exports from home country which increase the supply of foreign currency and shifts the supply curve to the right and vice versa
- Short run:
  - Flow of financial capital
  - Two variables responsible for large share of short-run capital flows: interest rates and expectations about future exchange rates
    - Interest rates: **interest parity** conditions which states that the difference between any pair of countries interest rates is about equal to the expected change in the exchange rate: $i - i^* \simeq (F - R) \div R$. (home interest rate = i, foreign interest rate = i^*, F & R are the expected future current exchange rates respectively)
      - F-R = the expected appreciation or depreciation
      - F>R = dollar is expected to depreciate
      - F<R = dollar is expected to appreciate and is selling at a premium
    - Expectations about future exchange rates

FIGURE 15.5 The Effects of an Increase in Home's Interest Rate



An increase in domestic interest rates causes a decrease in demand and an increase in supply of the foreign currency. Both effects cause an appreciation in the exchange rate from R_1 to R_2.

TABLE 15.4 Major Determinants of an Appreciation or Depreciation

	R Falls: An Appreciation in the Domestic Currency	R Rises: A Depreciation in the Domestic Currency
Long run: Purchasing Power Parity	Home goods are less expensive than foreign goods	Home goods are more expensive than foreign goods
Medium run: The Business Cycle	Domestic economy grows more slowly than foreign	Domestic economy grows faster than foreign
Short run (1): Interest Parity	Home interest rates rise, or foreign rates fall	Home interest rates fall, or foreign rates rise
Short run (2): Speculation	Expectations of a future appreciation	Expectations of a future depreciation

REAL EXCHANGE RATE

Real exchange rate: is the market exchange rate (or nominal exchange rate) adjusted for price differences

Real exchange rate
= [(Nominal exchange rate) × (Foreign price)]/(Domestic price)
= [($1.20 per euro) × (€200 per case)]/($180 per case)
= ($240 per case of French wine)/($180 per case of American wine)
= $1\frac{1}{3}$ cases of American wine per one case of French wine

calculation:

Real exchange rate
= Nominal exchange rate × (Foreign prices)/(Domestic prices),

or, more compactly,

$$R_r = R_n(P^*/P).$$

Suppose, for example, that the U.S. dollar–EU euro nominal exchange rate is $1.20 per euro and that both price levels are initially set at 100. In this case, the cost of a basket of goods and services is the same in real terms in both countries and

$$R_r = R_n(P^*/P) = R_n(100/100) = R_n.$$

The real rate equals the nominal rate when the purchasing power is the same in both countries. Note that purchasing power parity indicates that this is the long-run equilibrium. Over time, however, if inflation is higher at home than in the foreign country, P rises more than P^*, and R_r falls, meaning the domestic currency appreciates in real terms.

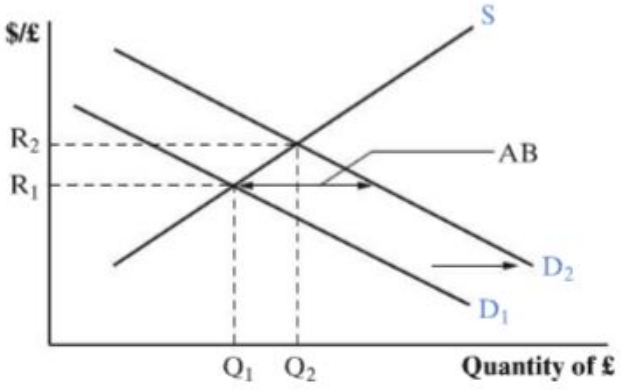
By way of illustration, suppose that the United States has 10 percent inflation while the EU has 0 percent. Then, the real U.S.-EU exchange rate (in terms of dollars per euro) would be as follows:

$$R_r = (\$1.20 \text{ per euro}) \times (100/110) = \$1.0909 \text{ per euro}.$$

ALTERNATIVES TO FLEXIBLE EXCHANGE RATES

- Fixed exchange rate system: also known as pegged exchange rate systems.
    - Several ways to set value of country's currency:
        - Country gives up their currency & adopts currency of another country
        - Country has their currency = a fixed amount of another country's currency
    - Gold standards are one type of fixed exchange rate: 3 conditions
        - Must fix the value of their currency unit in terms of gold
        - Nations keep the supply of their domestic money fixed in some constant proportion to their supply of gold
        - Nations must be willing and ready to provide gold in exchange for their home country currency

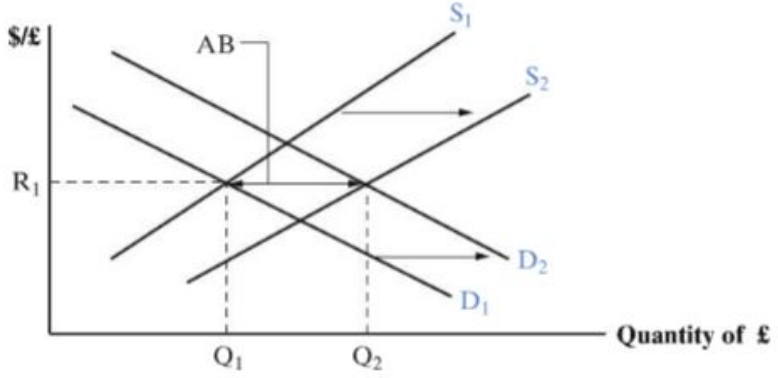
FIGURE 15.6 **Fixed Exchange Rates and Changes in Demand**



An increase in the demand for British pounds puts pressure on the exchange rate and will cause the dollar to depreciate to R_2 unless the increase in demand is countered by an increase in supply equal to line segment AB.

- Hard peg vs soft peg:
    - Hard peg: if the exchange rate is not allowed to vary
    - Soft peg: fixed exchange rates that fluctuate within a set band

FIGURE 15.7 **Selling Reserves of Pounds to Counter a Weakening Dollar**



By selling gold equal in value to AB pounds, the United States prevents a depreciation in the dollar–pound exchange rate.

- Pegged exchange rates: similar to gold standard except that instead of fold, another currency is used to "anchor" the value of the home currency
    - Problem:
        - home currency's value is synchronized with its peg, so changes between the peg and a third-party currency are identical for the home currency and the third party
            - Solution: peg the currency to a group of currencies
        - Significant difference in inflation rates between home country and its peg

- Solution: “crawling peg” which are soft pegs that are fixed but periodically adjusted; the idea is to offset any differences in inflation (changes in P) through regular adjustments in R_n

CHOOSING THE RIGHT EXCHANGE RATE SYSTEM

- Goal is to find the system that helps minimize negative shocks to an economy and the source of the shock determines whether a more flexible or more fixed system should be adopted
    - Fixed rate it better when:
        - Central bank produces too much new money
    - Flexible rate is better when:
        - Shocks originate from external environment such as if there is a sudden change in the price of imported oil
- However, exchange rate pegs are more popular for 2 reasons:
    - Credibility is an important element of an exchange rate system and exchange rate pegs offer credibility
    - Relatively high degree of trade dependence on a single, major economy

Single currency areas:

- 4 reasons why a group of countries want to share a common currency
    - A single currency eliminates the need to convert each other’s money and reduces transactions costs in a number of ways
    - A single currency eliminates price fluctuations caused by changes in the exchange rate
    - Elimination of exchange rates through the adoption of a single currency can help increase political trust between countries seeking to increase their integration
    - In some developing countries the adoption of a common currency may give their exchange rate system greater credibility
- Conditions for adopting a single currency: 4 conditions
    - The business cycle must be synchronized and national economies must enter recessions and expansions at more or less the same time
    - High degree of labor and capital mobility between the member countries
    - There are regional policies capable of addressing the imbalances that may develop
    - Nations involved must be seeking a level of integration that goes beyond simple free trade

APPENDIX: THE INTEREST RATE PARITY CONDITION

The interest rate parity condition

- The forward and the interest rates have the same term to maturity
- Investor has the choice between i & i^*
- Letting the dollar be the home currency, $1 invested today will return $1(1+i) next period if invested at home

i= home country interest rate

i^*= foreign interest rate

R = nominal exchange rate in units of home country currency per unit of foreign currency

F = forward exchange rate

To make the comparison with a foreign investment, the dollar first has to be converted into the foreign currency, then invested, and the earnings must be converted back into dollars. The equivalent of $1 in foreign currency is 1/R. If 1/R is invested abroad, at the end of the next period it returns $(1/R)(1 + i^*)$, which is in units of foreign currency. The reconversion to dollars can be done in the forward market where the exchange rate for a forward contract is F. Therefore, in dollars, $1 invested abroad will return $(1/R)(1 + i^*)F$ in the next period.

The interest parity condition states that investors will be indifferent between home and foreign investments (of similar risk), implying that they will move their funds around and cause interest rates and exchange rates to change until the returns are the same in the two cases:

$$1 + i = (1/R)(1 + i^*)F = (1 + i^*)(F/R)$$

Divide by $(1 + i^*)$:

$$(1 + i)/(1 + i^*) = F/R$$

Subtract 1 from both sides:

$$[(1 + i)/(1 + i^*)] - [(1 + i^*)/(1 + i^*)] = F/R - R/R$$
$$[(1 + i) - (1 + i^*)]/[(1 + i^*)] = (F - R)/R$$
$$(i - i^*)/(1 + i^*) = (F - R)/R.$$

The left-hand side denominator is close to 1 for small values of i^* (this is why we state the interest parity condition as an approximation). The right-hand side is the percentage difference between the forward and spot rates. If it is negative, markets expect an appreciation in the home currency. Rewriting the last equation,

$$i - i^* \approx (F - R)/R,$$

which says that the difference between home country and foreign interest rates is approximately equal to the expected depreciation in the home country currency.