Chapter 1

Preliminaries

Trade-Offs

- **Consumers:** Limited incomes. Their interest is their well being. Make trade-off decisions that would maximize well-being.
- **Workers:** Decide when to enter the workforce, or make a trade-off decision btw working now and having money or pursuing education and making money later. Make choice of where to work based on benefits/advantages/disadvantages/etc. Choose preference of hours worked (labor vs leisure).
- **Firms:** Limitations of capacity/resources. Quantity vs Quality?

Market: Buyers and Sellers.

- **Buyers:** consumers (G & S) and firms (labor, capital, raw materials to produce G & S)
- **Sellers:** firms (G & S), workers (labor services), resource owners (raw materials)

Arbitrage: Buying at a low price at one locations and selling at a higher price in another. (The possibility of arbitrage prevents prices of gold in different locations from differing significantly, and thus creates a *world* market for Gold).

Perfectly competitive market: Has many buyers and sellers, so much so that no single buyer or seller has any impact on price. (Ex: wheat, corn)

- In a perfectly competitive market, the **market price** will usually prevail.
- The market prices of most goods will fluctuate, sometimes very rapidly. Especially goods sold in competitive markets. (Wheat, soybeans, coffee, oil, gold, silver, lumber)

Noncompetitive market: The oil market.

Extent of a market: Boundaries of a market (geographic and range).

- **Geographic:** Prices of gas will vary depending on expense to ship over various distances, prices of homes depending on location, etc.
- **Range:** On the other hand, gasoline will not be sold in the same market as diesel fuel, because regular cars cannot make any use of diesel fuel, and vice-versa.

Market definition is important for 2 reasons:

1. A company must understand who its actual and potential competitors are for the various products that it sells or might sell in the future. It must also know the product boundaries and geographical boundaries of its market in order to set price, determine advertising budgets, and make capital investment decisions.
2. It can be important for public policy decisions.

Real VS Nominal Prices

We need to measure prices relative to an *overall price level*. We must correct for inflation when comparing prices across time. (aka measuring prices in **real** rather than **nominal** terms).

Nominal Price: "current-dollar" price; the *absolute* price; aka Retail Price.

Real Price: "constant-dollar" price; the price adjusted for inflation.

- When comparing price changes, use Real Price.

Consumer Price Index (CPI): An aggregate measure of prices. Records how the cost of a large market basket of goods purchased by a "typical" consumer changes over time. P*ercentage changes in the CPI measure the rate of inflation in the economy.*

Producer Price Index (PPI): Records (on average) how prices at the wholesale level change over time. *Percentage changes in the PPI measure cost inflation and predict future changes in the CPI.*

- Calculating Real Prices

$$\underset{\text{Base Year}=100}{\text{Real Price}} = \frac{\text{CPI}_{\text{Base Year}}}{\text{CPI}_{\text{Current Year}}} \times \text{Nominal Price}_{\text{Current Year}}$$

- Example: Real Price of College

	1970	1980	1990	2000
CPI	38.8	82.4	130.7	181.0
Nominal Price	$2,530	$4,912	$12,018	$18,273

Year	Nominal Price	CPI	Real Price
1970	$2,530	38.8	= ? = $2,530
1990	$12,018	130.7	= ? = $3,568
2000	$18,273	181.0	= ? = $3,917

From MyLab & Mastering:

Q: Suppose that the Japanese yen falls against the US dollar - that is, it will take fewer dollars to buy a given amount of Japanese yen. Explain why this decrease simultaneously decreases the real price of Japanese cars for US consumers and increases the real price of US automobiles for Japanese consumers.

A: As the value of the yen falls relative to the dollar, the purchase of a Japanese automobile priced in yen requires **fewer** dollars, and the purchase of a US automobile priced in dollars requires **more** yen.

Chapter 2

The Basics of Supply and Demand

Without government intervention, supply and demand will come into equilibrium to determine Market Price of a good, and the total quantity produced.

On graph: Vertical axis shows the Price (P) of a good, measures in *dollars per unit*. Horizontal axis shows Total Quantity Supplied (Q), measured in the *number of units per period*.

2.1 Supply and Demand

Supply Curve (S): Shows the quantity of a good that producers are willing to sell *at a given price*, holding constant any other factors. Slopes upward: the higher the price, the more that firms are able and willing to produce and sell.

Qs=c+dP

Changes in *price* result in *movements along the Supply curve (aka "change in the quantity supplied").*

The distance Price and Cost is **Profit Margin**.

Other variables that affect Supply

Changes in these variables will *shift the Supply curve (aka "change in supply")*

- **Costs of production:** Lower costs make production more profitable, encouraging existing firms to expand production and enabling new firms to enter the market. If market price P stays constant while costs go down, we would observe a greater quantity supplied.
  - Production costs ↓, output ↑. Entire supply curve shifts to the right.
- **Interest Rates:** Low interest rate will influence company to invest in more product/ inventory.
  - Interest rates ↓, output ↑.
- **Technology:** Innovation will result in higher productivity.

Demand Curve (D): Shows how much of a good consumers are willing to buy *as the price per unit changes*. Slopes downward: consumers are (usually) ready to buy more if the price is lower.

Qd=a-bP

Movements along the demand curve = "change in quantity demanded"

Variables that *shift* Demand:

(aka *"change in demand"*)

- **Income:** Greater incomes will permit consumers to spend more money on any good.
  - Income↑, Quantity demanded↑.
- **Prices of substitutes:** Increase in the price of one leads to an increase in Qd of the other.
  - Pb↑, Qb↓ so Qa↑.
- **Prices of complements:** Increase in the price of one leads to a decrease in Qd of the other.
  - Pb↑, Qb↓ so Qa↓.
- **Interest Rates:** High interest rates will influence consumers to *save* their money.
- **Weather & trends**
- **Expectations**

2.2 The Market Mechanism

Equilibrium: P*=Q* (aka Market-Clearing price)

The Market Mechanism is the tendency in a *free market* for the price to change until the market "clears"; until the Q demanded and the Q supplied are equal. Because there is no excess demand or supply, there is no pressure for price to change further.

Market Surplus: Quantity supplied exceeds the quantity demanded. In order to sell the surplus, producers will have to bring price back down to P* which will bring Qd back up to Q*.

Market Shortage: Quantity demanded exceeds the quantity supplied.

For the Supply-Demand model to work, a market must be **competitive**. (aka buyers and sellers have little market power individually).

2.3 Changes in Market Equilibrium

A shift of both S and D will result in a slight increase in Price, but a large change in Q.

From MyLab & Mastering:

Steel and Aluminum are substitutes. If the price of steel increases, other things remaining the same, we would expect the price of aluminium to **increase** and the equilibrium quantity of aluminum to **increase**.

2.4 Elasticities of Supply and Demand

Elasticity: Measures the sensitivity of the impact on the *dependent* variable with respect to change in the *independent* variable. It is a number that tells us *the percentage change that will occur in one variable in response to a 1-percent increase in another variable.*

Price Elasticity of Demand

$E_p = (\%\Delta Qd)/(\%\Delta P) = (\Delta Q/Q)/(\Delta P/P) =$ **$(\Delta Q)/\Delta P) \times (P/Q)$**

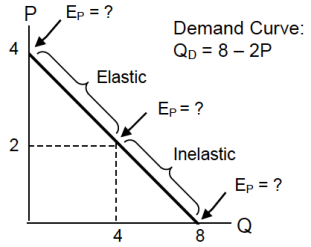
- "Percentage change in Quantity demanded/Percentage change in Price"
- **Qd=a-bP**
- Demand curve is negative-sloping. Hence, the **slope ($\Delta Q/\Delta P$)** should always be negative. (Slope=rise/run)

When $|\ {}_pE^D\ | = 0.5$ (<1), Price (Px) is inelastic. (more vertical)

- **$\%\Delta Qd < \%\Delta P$**

When $|\ {}_pE^D\ | = 2$ (>1), Px elastic. (more horizontal)

- **$\%\Delta Qd > \%\Delta P$**



"In general, the price elasticity of demand for a good depends on the availability of other goods that can be substituted for it. When there are close substitutes, a price increase will cause the consumer to buy less of this good and more of the substitute. Demand will then be high price elastic. (Example: shampoo). When there are no close substitutes, demand will tend to be price inelastic." p.31

From MyLab & Mastering:

Total Demand - Domestic Demand = Export Demand

2.5 Short-Run vs Long-Run Elasticities

From MyLab & Mastering:

Q: For many goods, the long-run price elasticity of supply is larger than the short-run elasticity. The long-run price elasticity of supply is typically larger because:

A: **in the short run, some firms may be constrained by their productive capacity.**

Q: Why do long-run elasticities of demand differ from short-run elasticities?

A: **Because durable goods last a relatively long time, and it takes time for consumers to respond to price changes.**

For most industries, supply is **less elastic** in the short run than in the long run.

Cyclical Industries: Industries that manufacture products whose demands fluctuate sharply in response to short-run changes in income.

Chapter 3

Analysis of Competitive Markets

3.1 Consumer and Producer Surplus

Consumer Surplus: measures the total net benefit to consumers.

- We can't always assume that those consumers who are able to buy the good are the ones who value it most highly, because sometimes A > B, and sometimes A < B.
  - (If people who want a good wait in line to obtain it, this opportunity cost of their time should be included as part of lost consumer surplus).

Producer Surplus: the benefit that lower-cost producers enjoy by selling at the market price

Deadweight Loss: An inefficiency caused by price controls; the loss in PS exceeds the gain in CS.

3.2 The Efficiency of a Competitive Market

Market Failure: Prices fail to provide proper signals to consumers and producers; the unregulated competitive market is inefficient. Happens because of:

1. Externalities: Produ./Consu. costs/benefits do not show as part of Market price.
2. Lack of information: Consumers lack info about quality/nature of a product.

3.3 Minimum Prices

A way to raise prices above the market-clearing level.

Minimum Wage: The distance between Q's and Q'd is **unemployment**.

3.4 Price Supports and Price Quotas

From MyLab & Mastering:

In a perfectly competitive market in which no market failure occurs and no government policy interferes with the equilibrium price and quantity, **deadweight loss is zero** and **the sum of producer and consumer surplus is maximized**.

Economic efficiency is achieved when **aggregate consumer and producer surplus is maximized**.

Chapter 6

Supply of Labor to the Economy: The Decision to Work

The demand for a good is a function of 3 factors:

1. The **opportunity cost** of the good
2. One's level of **wealth**
3. One's set of **preferences**

Opportunity Cost of leisure: The cost of spending an hour watch TV is what one could earn if one had spent that hour working. Thus, the opportunity cost of one hour of leisure is equal to one's wage rate.

Wealth and Income: total income = total wealth

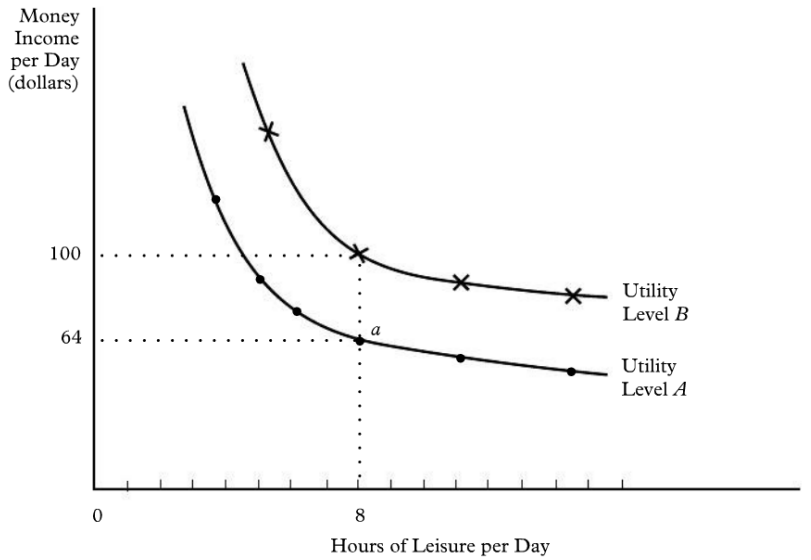
Income Effect: If income increases, holding wages constant, desired hours of work will go down/desired hours of leisure will go up. W↑, H↓ (-)

$$\text{Income Effect} = \frac{\Delta H}{\Delta Y}|\overline{W} < 0$$

Substitution Effect: If income is held constant, an increase in the wage rate will raise the price and reduce the demand for leisure, thereby increasing work incentives. (Leisure hours and work hours are substituted for eachother). W↑, H↑ (+)

$$\text{Substitution Effect} = \frac{\Delta H}{\Delta W}|\overline{Y} > 0$$

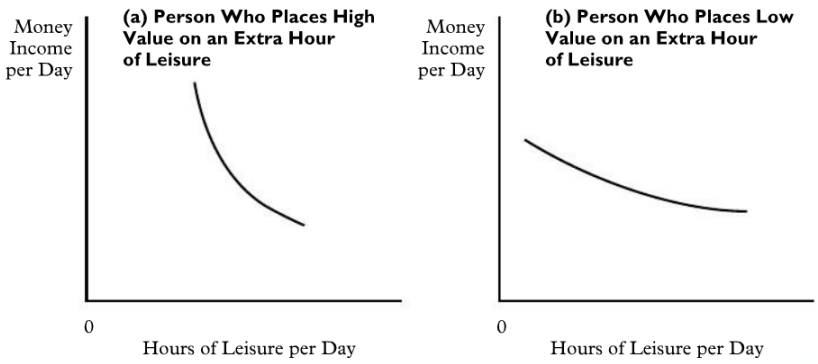
Two Indifference Curves for the Same Person



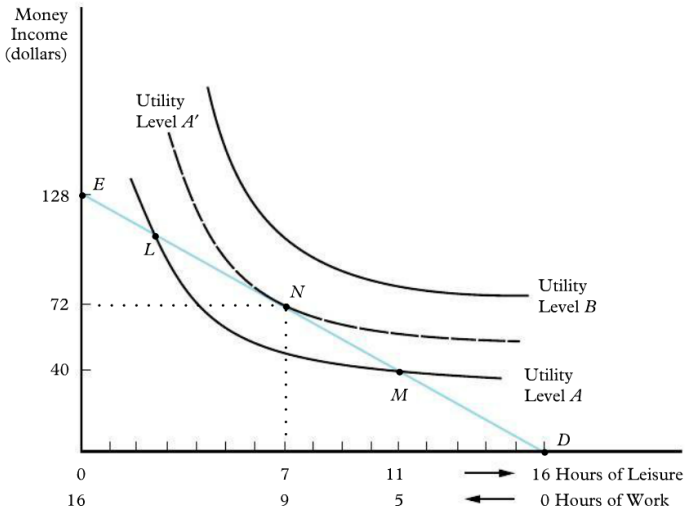
Indifference curves:

1. Utility B represents more happiness than level A. Every level of leisure consumption is combines with a higher income on B than on A.
2. Indifference curves do not intersect.
3. Indifference curves are negatively sloped because if either income or leisure course are increased, the other is reduced in order to preserve the same level of utility. (16 hours).
4. Indifference curves are convex (steeper at the left than at the right). This reflects the assumption that when money income is relatively high and leisure hours are relatively few, leisure is more highly valued.

Indifference Curves for Two Different People



Indifference Curves and Budget Constraint



128$ = equivalent to 16 hours x 8$

Budget line: Y=wH+v
(Where v= unearned income)

Wage rate = slope of budget line

$$\text{Wage Rate} = \frac{\Delta Y}{\Delta H}$$

Wage Increase with Substitution Effect Dominating

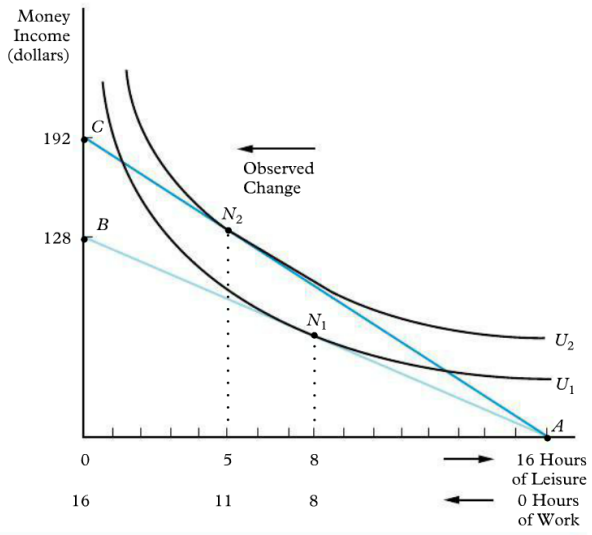
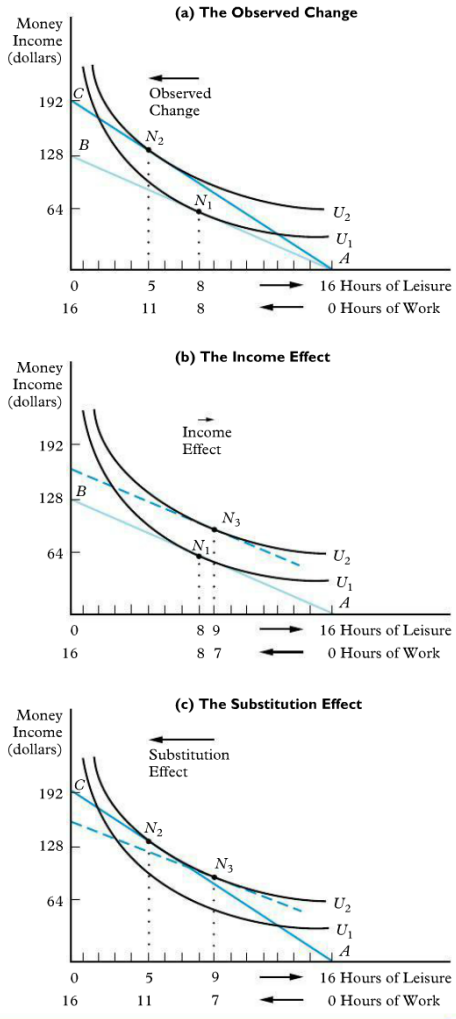
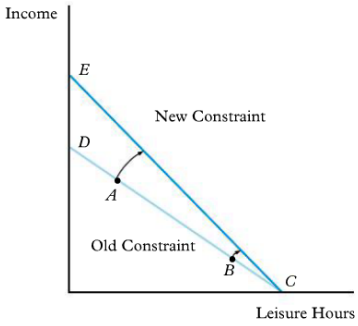


Figure 6.10

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



The Size of the Income Effect Is Affected by the Initial Hours of Work



The budget line will ONLY rotate if w increases. (Y=wH+v)

Reservation Wage: the wage below which a person will not work, and represents the value placed on an hour of lost leisure time.

Chapter 7

Uncertainty and Consumer Behaviour

Expected Value aka E(x): uncertain situation (weighted average) of the payoffs or values associated with all possible outcomes.

Risk Averse: Prefers certainty over risk. Has a diminishing marginal utility of income.

- Stable waged jobs
- life/health/car insurance

Risk Neutral: Indifferent between certain and uncertain outcomes. Constant marginal utility of income.

Risk Loving: Prefers uncertain to certain, even if the risky outcome is less than the risk-averse outcome.

Risk Premium: Maximum amount of $ that a risk-averse person will pay to avoid taking a risk.

Higher risk = higher risk premium

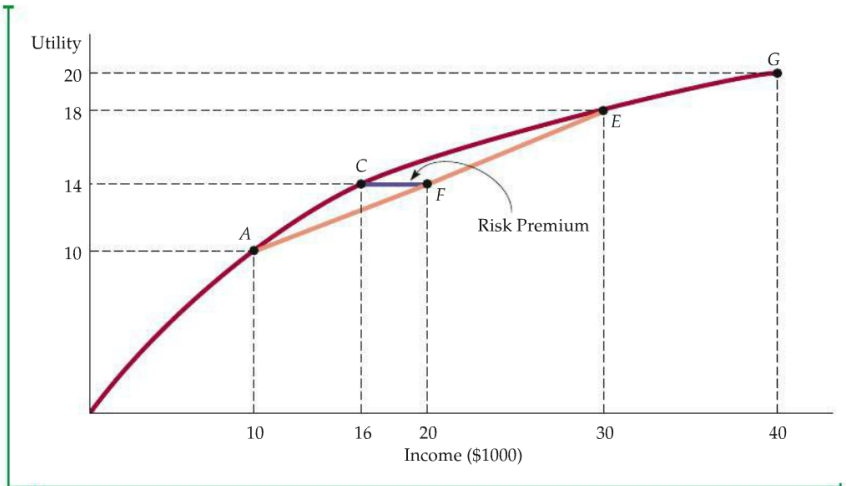


FIGURE 7.4
RISK PREMIUM

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.

Indifference Curve: f (Expected income, variability of income).

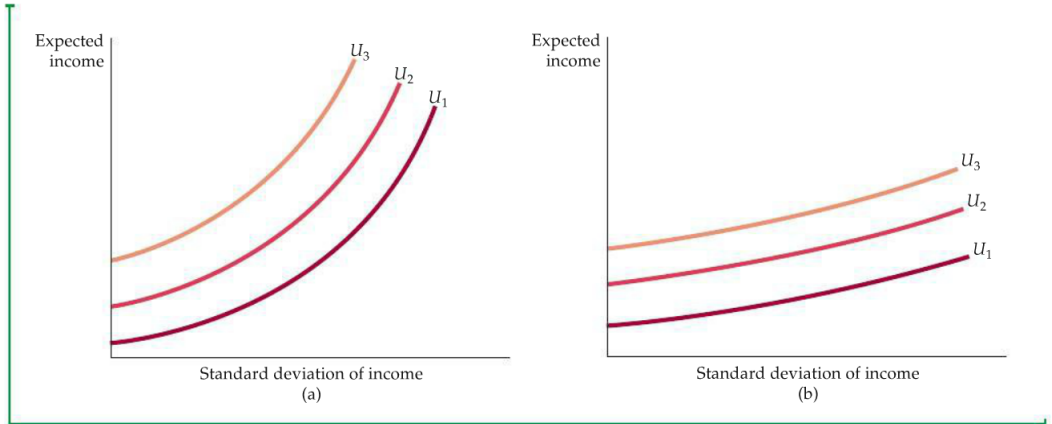


FIGURE 7.5
RISK AVERSION AND INDIFFERENCE CURVES

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.

7.3 Reducing Risk

Three ways both consumers and businesses reduce risks: Diversification, Insurance, and Obtaining more information about choices and payoffs.

1. **Diversification:** Allocating your resources to a variety of activities whose outcomes are not closely related. "As long as you can allocate your resources toward a variety of activities whose outcomes are not closely related, you can eliminate some risk."
   - Esp. useful for negatively correlated variable (heaters vs air conditioners)
   - Esp. important for stock market investors, but in general stock prices are positively correlated variable, so you still face risk.

Mutual Funds: Organizations that pool funds of individual investors to buy a large number of different stocks.

2. **Insurance:** Risk-averse people are willing to pay to avoid risk. Buying insurance assures a person of having the same income whether or not there is a loss.

Law of Large Numbers: Although single vents may be random and largely unpredictable, the average outcome of many similar events can be predicted.

Actuarial Fairness: When the insurance premium is equal to the expected payout.

3. **The value of complete information:** The difference between the expected value of a choice when there is complete information and the expected value when information is incomplete.

7.4 The Demand for Risky Assets

Asset: something that provides a flow of money or services to its owner.

- The monetary flow that one receives from asset ownership can take the form of an explicit payment.
  - Rental income, dividend on shares of common stock.
- Implicit: takes the form of an increase of decrease in the price of value of the asset.
  - Increase in the value of an asset: **capital gain**.
  - Decrease: **capital loss**.

Risky Asset: provides a monetary flow that is at least in part random. (Not known with certainty in advance).

- ex: Apartment building, corporate bonds.

Riskless (or risk-free) Asset: Pays a monetary flow that is known with certainty.

- ex: Savings accounts, short-term certificates of deposit, treasury bills.

Asset Returns: the total monetary flow it yields - including capital gains or losses - as fraction of its price.

Real return on an asset: nominal return less the rate of inflation.

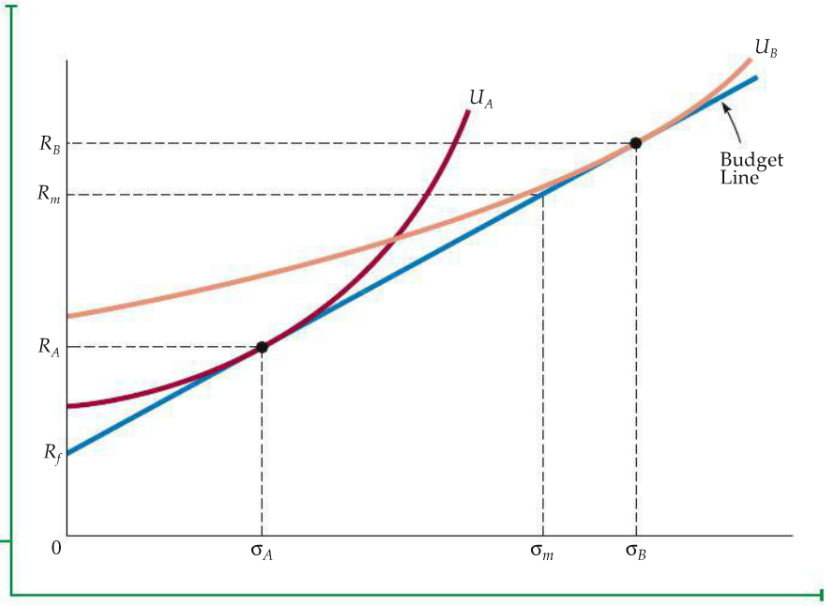
“Although stocks have a higher expected return that treasury bills, they also carry much more risk.”

“The higher the expected return on an investment, the greater the risk involved. As a result, the risk-averse investor must balance expected return against risk.”

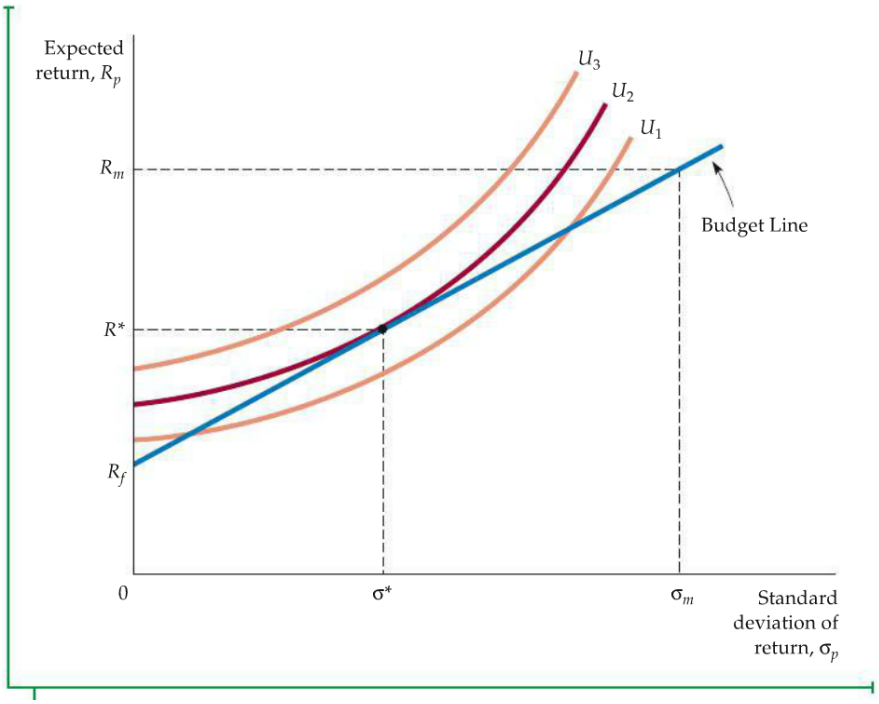
The budget line: “The expected return on the portfolio Rp increases as the standard deviation of that return increases.”

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.



Slope (aka the **price of risk**): tells us how much extra risk an investor must incur to enjoy a higher expected return.



Curve U_3 yields the greatest amount of satisfaction and U_1 the least amount: For a given amount of risk, the investor earns a higher expected return on U_3 than on U_2 and a higher expected return on U_2 than on U_1. Of the three indifference curves, the investor would prefer to be on U_3. This position, however, is not feasible, because U_3 does not touch the budget line. Curve U_1 is feasible, but the investor can do better. Our investor

will do best by choosing a combination of risk and return at the point where an indifference curve is tangent to the budget line (U_2).

Buying stocks on margin

The investor borrows money because she wants to invest more than 100% of her wealth in the stock market. Buying stocks on margin in this way is a form of **leverage**: the investor increases her expected return above that for the overall stock market, but at the cost of increased risk.

7.5 Bubbles

Bubble: An increase in the price of a good based not on the fundamentals of demand or value, but instead on a belief that the price (of stocks, for example) will keep going up. Comes with the idea that it can eventually be sold, at a profit.

Informational Cascade: An assessment based on the actions of others, which in turn were based on the actions of other, etc.

7.6 Behavioural Economics

Basic theory (adjusted) of consumer demand:

1. A tendency to value G or S in part based on the setting one is in
2. A concern about the fairness of an economic transaction
3. The use of the simple rules of thumb as a way to cut through complex economic decisions.

Reference Point: Depends on the setting in which the purchasing decision occurs.

Can develop because of: past consumption of a good, our experience in a market, our expectation about how prices should behave, and even the context in which we consume a good. Different Examples of reference points:

1. **Endowment Effect:** The fact that individuals tend to value an item more when they happen to own it than when they do not.
2. **Loss Aversion:** The tendency of individuals to prefer avoiding losses over acquiring gains. The loss “hurts” more than the perceived benefit from the gain.
3. **Framing:** A tendency to rely on the context in which a choice is described when making a decision. (Pretty packaging, a good slogan, etc)

Fairness and the Ultimatum Game: sharing 100$ fairly with a stranger. When a body of people set a maximum willingness to pay, demand will go down and will eventually bring price down. If enough workers do not feel that their wages are fair, there will be a reduction in the supply of labor, and wage rates will increase.

Rules of Thumb and Biases in decision making: Useful for matters in which we have little experience (like giving 15% tip).

1. **Anchoring:** The impact that a suggested piece of information may have on your final decision. (Setting a price at 19.95$ because it is under 20$)
2. **Rules of Thumb:** Help to save time and effort and result in only small biases. (Shipping costs ignored when assessing the real total cost of an online purchase)
3. **The Law of Small Numbers:** Tendency to overstate the probability that a certain event will occur when faced with relatively little information. (Or even completely disregarding the possibility of a particular event because the probability of it happening was very small).

Chapter 8

Overview of the Financial System

Financial Markets: Bond and Stock Markets

Have the essential economic function of channelling funds from households, firms, and governments, who have saved surplus funds by spending less than their income (**lender-savers**), to those who have a shortage of funds because they wish to spend more than they can earn (**borrower-spenders**).

- **Direct Finance:** Borrowers borrow funds directly from lenders in financial markets by selling them **securities**, which are claims on the borrower's future income or assets.
- **Indirect Finance:** Financial intermediaries borrow funds from lender-savers and then use these funds to make loans to borrower-spenders.
  - **Securities** are assets for the person who buys them but **liabilities** (IOUs or dets) for the individual or firm that sells/issues then.
    - **Bonds:** Debt securities that promise to make payments periodically for a specified period of time.
    - **Stocks:** Securities that entitle the owners to a share of the company's profits and assets.

Financial Intermediaries: Banks, insurance companies, pension funds

Structure of Financial Markets

A firm of individual can obtain funds in a financial market in two ways: issuing a debt instrument (bond or mortgage), or by raising funds by issuing equities (common stock).

Debt Market

Debt Instrument: A contractual agreement by the borrower to pay the holder of the instrument fixed dollar amounts at regular intervals (I+i) until a specified date (maturity date).

- Short term: maturity is less than a year
- Intermediate term: maturity is between 1 and 10 years

- Long term: maturity is 10 years or longer.

Equity Market

Equities: Claims to share i the net income (income after expenses and taxes) and the assets of a business. Often make periodic payments (**dividends**) to their holders and are considered long-term securities because there is no maturity date. Owning stocks also means that you own a portion of the firm and thus have the right to vote on issues important to the firm and to elect is directors.

An equity holder is a *residual claimant.* The corporation must pay all its debt holders before it pays its equity holders. But, equity holders benefit directly from any increases in the corporation's profitability or asset value, because equities confer ownership rights on the equity holders. (Debt holders will always only receive their fixed dollar payments).

Primary Market: a financial market in which new issues of a security (such as a bond or a stock) are sold to initial buyers by the corporation or government agency borrowing the funds.

- Behind closed doors, an **investment bank** guarantees the price of a corporation's securities (**underwrites**) and then sells them to the public.

Secondary Market: A financial market in which securities that have been previously issued can be resold. Make it easier to sell financial instruments (they make the financial instruments more **liquid**). This increased liquidity makes them more desirable and thus easier for the issuing from to sell in the primary market. Also, they determine the price of the security that the issuing firm sells in the primary market.

- Toronto Stock Exchange (TSX)
- Securities brokers and dealers are crucial to a well-functioning secondary market.
  - **Brokers:** agents of investors who match buyers with sellers of securities.
  - **Dealers:** link buyers and sellers by buying and selling securities at stated prices.

A corporation does not acquire any new funds when its securities are sold in the secondary market.

Secondary markets can be organized in two ways:

1. By organizing **exchanges**: buyers and sellers of securities meet in one central location to conduct trades.
2. By having an **over-the-counter (OTC) market**: dealers at different locations who have an inventory of securities stand ready to buy and sell securities OTC to anyone who comes to them and is willing to accept their prices. Very competitive.

Money Market: A financial market in which only short-term debt instruments are traded.

- **Government of Canada treasury bills:** They pay a set amount at maturity and have no interest payments. But they effectively pay interest by initially selling at a discount. (Pay 9,600$ in May 2013 for a one-year treasury bill that can be redeemed in May 2014 for 10,000$). Most liquid of all because they are most actively traded. Also the safest because there is almost no possibility of **default**.
- **Certificates of deposit (CD):** Pays annual interest of a given amount and at maturity pays back the original purchase price. Are negotiable, and can be resold in a secondary market. (5000$ to 100 000$)
- **Commercial paper:** Unsecured short-term debt instrument issued by large banks and corporations. The interest rate the corporation is charged reflects the firm's level of risk. **Finance paper** (short-term promissory notes) can also be issued. (denominations of 50 000$). Mostly issued on a discounted basis.
- **Repurchase agreements (Repos):** Short-term loans (maturity of less than 2 weeks) for which treasury bills serve as *collateral* (an asset that the lender receives if the borrower does not pay back the loan). (Mostly large corporations)
- **Overnight funds:** Overnight loans by banks to other banks.

Capital Market: The market in which longer-term debt and equity instruments are traded.

- **Corporate stocks:** Equity claims on the net income and assets of a corporation.
- **Residential mortgages:** Loans to households or firms to purchase housing land, or other real structures, where the structure or land serves as collateral for the loans.
- **Corporate Bonds:** Long-term bonds issued by corporations with very strong credit ratings.

- **Government of Canada bonds:** Intermediate-term bonds and long-term bonds are issued by the federal government to finance its deficit. Most liquid security traded in the capital market.
- **Canada savings bonds (CSBs):** floating-rate bonds, available in denominations from 100$ to 10 000$ and offered exclusively to individuals, estates, and specified trusts.
- **Provincial and Municipal government bonds:** Issued in order to finances schools, roads, other large programs.
- **Government agency securities:** Long-term bonds issued by various government agencies, to assist municipalities to finance mortgages, farm loans, or power-generating equipment.
- **Consumer and bank commercial loans**

Money market securities are usually more widely traded than longer-term securities, and thus tend to be more liquid. Also, short-term securities have smaller fluctuations in prices than long-term securities (which makes them safer investments).

Internationalization of Financial Markets

"Eurobond": A bond denominated in a currency other than that of the country in which it is sold.

Indirect Finance

Financial intermediation: Involves a financial intermediary that stands between the lender-savers and the borrower-spenders and helps transfer funds from one to the other. Can substantially reduce transaction costs.

Transaction costs: The time and money spent in carrying out financial transactions.

Economies of scale: reduction in transaction costs per dollar of transactions as the size (scale) of transaction increases.

Liquidity services: services that make it easier for customers to conduct transactions.

Risk sharing (or Asset Transformation): Financial intermediaries create and sell assets with risk characteristics that people are comfortable with, and then use the funds they acquire by selling these assets to purchase other assets that may have far more risk.

Asymmetric information: One party (in financial markets) often does not know enough about the other party to make accurate decisions.

Adverse Selection: The problem created by asymmetric information *before* the transaction occurs. Potential borrowers who are the most likely to produce an adverse outcome (bad credit risk) are the ones who most actively seek out a loan and are thus most likely to be selected.

Moral hazard: The problem created by asymmetric information *after* the transaction occurs. The risk (hazard) that the borrower might engage in activities that are undesirable from the lender's point of view because they make it less likely that the loan will be paid back. (Conflict of interest is an example of a moral hazard).

Financial intermediaries can alleviate these problems. They:

1. Provide liquidity services
2. Promote risk sharing
3. Solve information problems
4. Can achieve economies of scope (they can lower the cost of information production for each service by applying one information resource to many different services).

Regulation of the Financial System

Three reasons:

1. To increase the information available to investors
2. To ensure the soundness of the financial system
3. To improve control of monetary policy

Chapter 9

An Economic Analysis of Financial Structure

8 facts:

1. Stock are not the most important source of external financing for businesses.
2. Issuing marketable debt and equity securities is not the primary way in which businesses finance their operations.
3. Indirect finance, which involves the activities of financial intermediaries, is many times more important than direct finance in which businesses raise funds directly from lenders in financial markets.
4. Financial intermediaries, particularly banks, are the most important source of external funds used to finance businesses.
5. The financial system is among the most heavily 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 prevalent features of debt contracts for both households and businesses.
8. Debt contracts typically are extremely complicated legal documents that place substantial restrictions on the behaviour of the borrower.

Transaction Costs

Solutions of high transaction costs:

- **Economies of scale:** Bundle the funds of many investors together so that they can take advantage of economies of scale. Reduces transaction costs for each investor.
  - Mutual fund
- **Expertise:** liquidity services, expertise in computer technology

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Collateral: Property promised to the lender if the borrower defaults.

Net worth (aka Capital Equity): Diff. btwn firm's assets and its liabilities.

Principal-Agent Problem: Affects **Equity Contracts** (claims to a share in the profits and assets of a business). May occur when the manager in control (agent) may act in their own interest rather than in the interest of the shareholder-owner (principal) because the agent has less incentive to maximize profits than the principal.

Costly state verification: The monitoring of firm's activities process can be expensive in terms of time and money. Costly state verification makes the equity contract less desirable, and it explains in part why equity is not a more important element in our financial structure.

Chapter 10

Understanding Interest Rates

Four basic types of credit market instruments:

1. **Simple Loan:** Lender provides borrower with funds that must be payed back at maturity along with an additional interest payment.
2. **Fixed-payment loan (aka Fully Amortized Loan):** Lender provides borrower with funds, which must be repaid by making the same payment every period consisting of part of the principal and interest for a set number of years. (installment loans and mortgages)
3. **Coupon bond:** Pays the owner of the bond a fixed interest payment (coupon payment) every year until the maturity date, when a specified final amount (face value) is repaid. Coupon Rate: dollar amount of the yearly coupon payment expressed as a percentage of the face value of the bond. (canada and corporate bonds).
4. **Discount bond (aka zero-coupon bond):** Bought at a price below its face value (at a discount), and the face value is repaid at the maturity date. A discount bond does not make any interest payments, it just pays off the face value.

Yield to Maturity: The interest rate that equates the PV of cash flow payments received from a debt instrument with its value today. The most important and accurate way to calculate interest rate.

YTM on a Simple Loan: For simple loans, the simple interest rate = the yield to maturity.

Yield to Maturity on a Simple Loan

If Pete borrows $100 from his sister and next year she wants $110 back from him, what is the yield to maturity on this loan?

The yield to maturity on the loan is 10%.

$$PV = \frac{CF}{(1+i)^n}$$

where
PV = amount borrowed = $100
CF = cash flow in one year = $110
n = number of years = 1

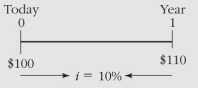
Thus

$$\$100 = \frac{\$110}{(1+i)}$$

$$(1+i)\,\$100 = \$110$$

$$(1+i) = \frac{\$110}{\$100}$$

$$i = 1.10 - 1 = 0.10 = 10\%$$



YTM on a Fixed-Payment Loan:

$$\$1000 = \frac{\$126}{1+i} + \frac{\$126}{(1+i)^2} + \frac{\$126}{(1+i)^3} + \cdots + \frac{\$126}{(1+i)^{25}}$$

More generally, for any fixed-payment loan,

$$LV = \frac{FP}{1+i} + \frac{FP}{(1+i)^2} + \frac{FP}{(1+i)^3} + \cdots + \frac{FP}{(1+i)^n}$$

where

LV = loan value
FP = fixed yearly payment
n = number of years until maturity

Yield to Maturity on a Fixed-Payment Loan

You decide to purchase a new home and need a \$100 000 mortgage. You take out a loan from the bank that has an interest rate of 7%. What is the yearly payment to the bank to pay off the loan in 20 years?

The yearly payment to the bank is \$9439.29.

$$LV = \frac{FP}{1+i} + \frac{FP}{(1+i)^2} + \frac{FP}{(1+i)^3} + \cdots + \frac{FP}{(1+i)^n}$$

where

LV = loan value amount = \$100 000
i = annual interest rate = 0.07
n = number of years = 20

Thus

$$\$100\,000 = \frac{FP}{1+0.07} + \frac{FP}{(1+0.07)^2} + \frac{FP}{(1+0.07)^3} + \cdots + \frac{FP}{(1+0.07)^{20}}$$

YTM on a Coupon Bond: Same as fixed-payment calculation.

$$P = \frac{\$100}{1+i} + \frac{\$100}{(1+i)^2} + \frac{\$100}{(1+i)^3} + \cdots + \frac{\$100}{(1+i)^{10}} + \frac{\$1000}{(1+i)^{10}}$$

More generally, for any coupon bond,[2]

$$P = \frac{C}{1+i} + \frac{C}{(1+i)^2} + \frac{C}{(1+i)^3} + \cdots + \frac{C}{(1+i)^n} + \frac{F}{(1+i)^n}$$

where

P = price of coupon bond
C = yearly coupon payment
F = face value of the bond
n = years to maturity date

1. When the coupon bond is priced at its FV, the yield to maturity equals the coupon rate.
2. The price of a coupon bond and the yield to maturity are negatively related. As the YTM rises, the price of the bond falls and vice-versa.
3. The YTM is greater than the coupon rate when the bond price is below its face value.

YTM on a Consol (or Perpetuity): A perpetual bond with no maturity date and no repayment of principal.

$$P_c = \frac{C}{i_c} \tag{4}$$

where

P_c = price of the perpetuity (consol)
C = yearly payment
i_c = yield to maturity of the perpetuity (consol)

One nice feature of perpetuities is that you can immediately see that as i_c goes up, the price of the bond falls. For example, if a perpetuity pays \$100 per year forever and the interest rate is 10%, its price will be \$1000 = \$100/0.10. If the interest rate rises to 20%, its price will fall to \$500 = \$100/0.20. We can also rewrite this formula as

$$i_c = \frac{C}{P_c} \tag{5}$$

Yield to Maturity on a Perpetuity

What is the yield to maturity on a bond that has a price of \$2000 and pays \$100 annually forever?

The yield to maturity would be 5%.

$$i_c = \frac{C}{P_c}$$

where

C = yearly payment = \$100
P_c = price of perpetuity (consol) = \$2000

Thus

$$i_c = \frac{\$100}{\$2000}$$

$$i_c = 0.05 = 5\%$$

Yearly coupon payment (C) / price of the security (P_t) = **Current yield (i_c)**.

YTM on a Discount Bond: YTM is negatively related to the current bond price. A fall in the yield to maturity means that the price of the discount bond has risen.

If the current purchase price of this bill is \$900, then equating this price to the present value of the \$1000 received in one year, using Equation 1 (page 63), gives

$$\$900 = \frac{\$1000}{1 + i}$$

and solving for i,

$$\begin{aligned}(1 + i) \times \$900 &= \$1000\\ \$900 + \$900i &= \$1000\\ \$900i &= \$1000 - \$900\\ i &= \frac{\$1000 - \$900}{\$900} = 0.111 = 11.1\%\end{aligned}$$

More generally, for any one-year discount bond, the yield to maturity can be written as

$$i = \frac{F - P}{P} \tag{6}$$

where

F = face value of the discount bond
P = current price of the discount bond

Current bond prices and interest rates are negatively related: when the interest rate rises, the price of the bond falls, and vice versa.

The distinction between Interest Rates and Returns

Rate of Return: Accurately measures how well a person does by holding a bond or any other security over a particular time period. Defined as the payments to the owner plus the change in its value, expressed as a fraction of its purchase price.

The return on a bond will not necessarily equal the yield to maturity on that bond.

$$RET = \frac{C + P_{t+1} - P_t}{P_t}$$

where

RET = return from holding the bond from time t to time $t+1$
P_t = price of the bond at time t
P_{t+1} = price of the bond at time $t+1$
C = coupon payment

Calculating the Rate of Capital Gain

Calculate the rate of capital gain or loss on a 10-year zero-coupon bond for which the interest rate has increased from 10% to 20%. The bond has a face value of $1000.

The rate of capital gain or loss is −49.7%.

$$g = \frac{P_{t+1} - P_t}{P_t}$$

where

P_{t+1} = price of the bond one year from now $= \frac{\$1000}{(1 + 0.20)^9} = \$193.81$

P_t = price of the bond today $= \frac{\$1000}{(1 + 0.10)^{10}} = \$385.54$

Thus

$$g = \frac{\$193.81 - \$385.54}{\$385.54}$$

$$g = -0.497 = -49.7\%$$

Returns will differ from the interest rate especially if there are sizeable fluctuations in the price of the bond that produce substantial capital gains or losses.

Prices and returns for long-term bonds are more volatile than those for shorter-term bonds.

Interest-rate Risk: Riskiness of an asset's return that results from interest-rate changes.

A convenient way to rewrite the return formula in Equation 8 is to recognize that it can be split into two separate terms:

$$RET = \frac{C}{P_t} + \frac{P_{t+1} - P_t}{P_t}$$

The first term is the current yield i_c (the coupon payment over the purchase price):

$$\frac{C}{P_t} = i_c$$

The second term is the **rate of capital gain**, or the change in the bond's price relative to the initial purchase price:

$$\frac{P_{t+1} - P_t}{P_t} = g$$

where g = rate of capital gain. Equation 8 can then be rewritten as

$$RET = i_c + g \qquad (8)$$

The distinction between Real and Nominal interest rates

Real interest rate: The interest rate that is adjusted by subtracting expected changes in the price level (inflation) so that is more accurately reflects the true cost of borrowing.

Fisher equation: $i = i_r + \pi^e$ >>> $i_r = i - \pi^e$

i_r = cost of borrowing

Example:

If nominal interest rate is 8% and the expected inflation rate is 10%…

The real interest rate is -2% (0.08-0.10). As a lender: Although you will be receiving 8% more dollars at the end of the year, you will be paying 10% more for goods. The result is that you will be able to buy 2% fewer goods at the end of the year, and you will be 2% worse off in real terms. As a borrower: you will have to pay 2% less back.

When the real interest rate is low, there are greater incentives to borrow and fewer incentives to lend.

Real returns: Inflation is subtracted from the nominal return. Indicates the amount of extra goods and services that can be purchased as a result of holding the security.

Calculating the Principal and Coupon Payment of Real Return Bonds

Consider a real return bond with a face value of $1000 and a coupon yield of 2%. Calculate the principal and coupon payment after one year if the inflation rate is 3%.

After a year, to account for inflation, the principal will be increased by 3%, from $1000 to $1030. The coupon yield is still 2%, but applies to the new principal of $1030, instead of $1000. Hence, the coupon payment will be $0.02 \times \$1030 = \$20.60$.

Chapter 11

The Behaviour of Interest Rates

Asset: a piece of property that is a store of value.

Determinants of Asset demand:

1. **Wealth (+)**

When wealth increases, the quantity of assets we demand increases.

2. **Expected Return (+):** The expected return on one asset relative to alternative assets.

$E(R)_a\uparrow$, $E(R)_{others}$ remains the same, $D_{others}\downarrow$

3. **Risk (-):** Degree of uncertainty associated with the return on one asset relative to alternative assets.

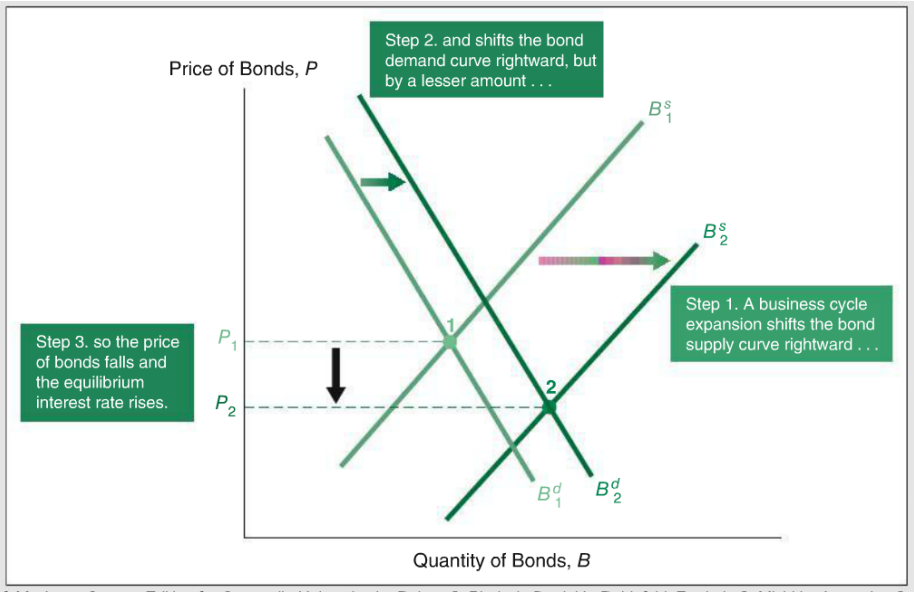
$Risk_a\uparrow$, $D_a\downarrow$, $D_{others}\uparrow$

4. **Liquidity:** The ease and speed with which an asset can be turned into can relative to alternative assets.

$Liquidity_a\uparrow$, $D_a\uparrow$, $D_{others}\downarrow$

Theory of Portfolio Choice: Tells us how much of an asset people want to hold in their portfolio. Holding all other factors constant:

1. Quantity demanded of an asset is positively related to wealth
2. Quantity demanded of an asset is positively related to its expected return relative to alternative assets.
3. Quantity demanded of an asset is negatively related to the risk of its returns relative to alternative assets.
4. Quantity demanded of an asset is positively related to its liquidity relative to alternative assets.



Supply and Demand in the Bond market

Negative relationship between bond prices and interest rates means that when we see that the bond price rises, the interest rate falls.

$$i = RET^e = \frac{F - P}{P}$$

where i = interest rate = yield to maturity

RET^e = expected return

F = face value of the discount bond

P = initial purchase price of the discount bond

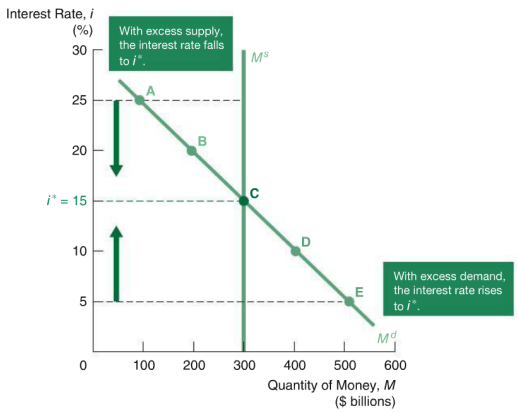
If a 1000$ bond sells for 950$:

- Interest rate and expected return is : (1000-950)/950 = 0.053 = 5.3%
- At a price of 900$: (1000-900)/900 = 0.111 = 11.1%
  - Expected return is higher, so quantity demanded of bonds will be higher. (Portfolio theory)

The

rather

prices. Is



Asset market approach: emphasizes stocks of assets than flows in determining asset now the dominant methodology used by

economists because correctly conducting analyses in terms of flows is very tricky, especially when we encounter inflation.

Changes in Equilibrium Interest Rates

Shift of the demand curve: Occurs when the quantity supplied/demanded changes at each given price/interest rate in response to a change in one of these factors:

1. **Wealth**

When the economy is growing rapidly in a business cycle expansion and wealth is increasing, the Q of bonds demanded at each bond price/interest rate increases and demand curve shifts to the right.

If households save more, wealth increases and demand curve shifts to the right.

2. **Expected returns on bonds relative to alternative assets**

Higher expected interest rates in the future lower the expected return for long-term bonds, decrease the demand, and shift the demand curve to the left.

Lower expected interest rates in the future increase the demand for long-term bonds and shift the demand curve to the right.

A increase in expected rate of inflation lowers the expected return for bonds, causing their demand to decline and the demand curve to shift to the left.

3. **Risk of bonds relative to alternative assets**

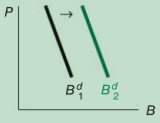
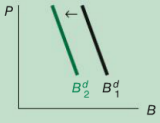
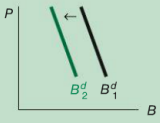
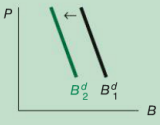
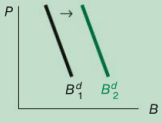
An increase in the riskiness of bonds causes the demand for bonds to fall and the demand curve to shift to the left.

An increase in the riskiness of alternative assets causes the demand for bonds to rise and the demand curve to shift to the right.

4. **Liquidity of bonds relative to alternative assets**

Increased liquidity of bonds results in an increased demand for bonds, and the demand curve shifts to the right.

Increase liquidity of alternative assets lowers the demand for bonds and shifts the demand curve to the left.

Variable	Change in Variable	Change in Quantity Demanded at Each Bond Price	Shift in Demand Curve
Wealth	↑	↑	
Expected interest rate	↑	↓	
Expected inflation	↑	↓	
Riskiness of bonds relative to other assets	↑	↓	
Liquidity of bonds relative to other assets	↑	↑	

When one of these factors change, there will be a new equilibrium value for the interest rate.

Shift of the Supply curve:

1. **Expected profitability of investment opportunities**

In a business cycle expansion, the supply of bonds increases, and the supply curve shifts to the right. In a recession, when there are far fewer expected profitable investment opportunities, the supply of bonds falls and the supply curve shifts to the left.

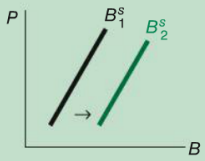
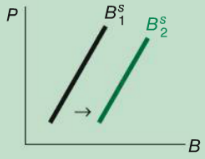
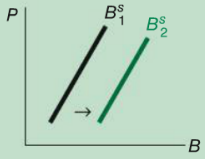
2. **Expected inflation**

Real interest rate = nominal interest rate - inflation.

If inflation rises, the real cost of borrowing falls. An increase in expected inflation causes the supply of bonds to increase and the supply curve to shift to the right.

3. **Government activities**

Higher government deficits increase the supply of bonds and shift the supply curve to the right.

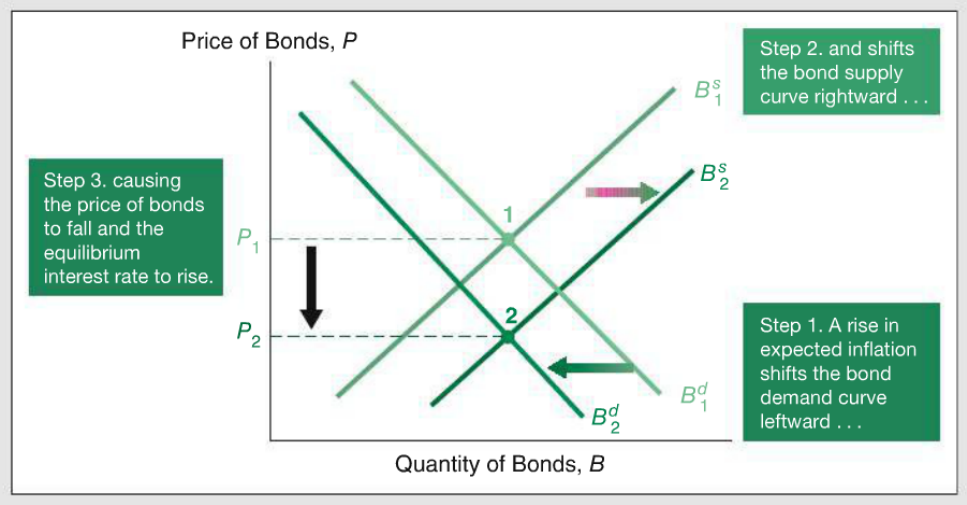
Variable	Change in Variable	Change in Quantity Supplied at Each Bond Price	Shift in Supply Curve
Profitability of investments	↑	↑	
Expected inflation	↑	↑	
Government deficit	↑	↑	

Government surpluses decrease the supply of bonds and shift the supply curve to the left.

Changes in interest rate due to Expected Inflation

Fisher Effect: When expected inflation rises, interest rates will rise.

If expected inflation rises, the expected return on bonds relative to real assets falls for any given bond price and interest rate.



$i = i_r + \pi^e$

8 = 5 + 3

8 = _ + 5

When πe ↑, Bs ↑ and Bd ↓ because investors won't want to invest knowing that πe will increase. P ↓.

When Bs ↑ and Bd↓ price will always be lower. The change in Q will depend.

Changes in the interest rate due to a business cycle expansion

In a business cycle expansion, the amount of goods and services being produced in the economy rises, so national income increases. When this occurs, business will be more willing to borrow because they are likely to have many profitable investment opportunities for which they need financing. Hence, at a given bond price, the quantity of bonds that firms want to sell will increase.

When Bs ↑ and Bd ↑, Q will always be higher, and change in Price/interest rate depends on whether the supply curve shifts more than the demand curve or vice versa.

Supply and Demand in the Market for Money

The Liquidity Preference Framework: determines the equilibrium interest rate in terms of the supply and demand for money.

- 2 main categories of assets that people use to store their wealth:
    1. Money
    2. Bonds

Bs + Ms = Bd + Md

Rewritten: **Bs - Bd = Md - Ms**

If the market for money is in equilibrium, the right-hand side of the equation equals zero, implying that Bs = Bd… meaning that the bond market is also in equilibrium.

i ↑, Md ↓ because the opportunity cost of holding money is higher.

Changes in Equilibrium Interest Rates

Shifts in Demand of Money

Income Effect: As an economy expands and income rises, wealth increases and people will want to hold more money as a stole of value. Also, as the economy expands and income rises, people will want to carry out more transactions using money, with the result that they will also want to hold more money.

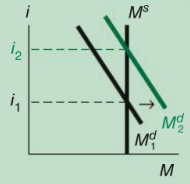
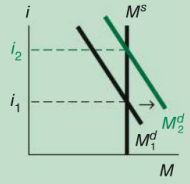
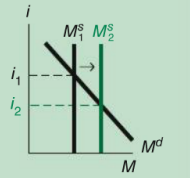
A higher level of income causes the demand for money at each interest rate to increase and the demand curve to shift to the right.

Income ↑, Md ↑.

Price-Level Effect: When the price level rises, the same nominal quantity of money is no longer as valuable; it cannot be used to purchase as many real goods or services. To restore their holdings of money in real terms to their formal level, people will want to hold a greater nominal quantity of money.

A rise in the price level causes the demand for money at each interest rate to increase and the demand curve to shift to the right.

Price level ↑, Md ↑.

Variable	Change in Variable	Change in Money Demand (M^d) or Supply (M^s) at Each Interest Rate	Change in Interest Rate	
Income	↑	M^d ↑	↑	
Price level	↑	M^d ↑	↑	
Money supply	↑	M^s ↑	↓	

Shifts in Supply of Money

An increase in the money supply engineered by the Bank of Canada will shift the supply curve for money to the right.

When the money supply increases, interest rates will decline.

Ms ↑, i↓

Income Effect: When income (and money supply) is rising during a business cycle expansion, interest rates will rise.

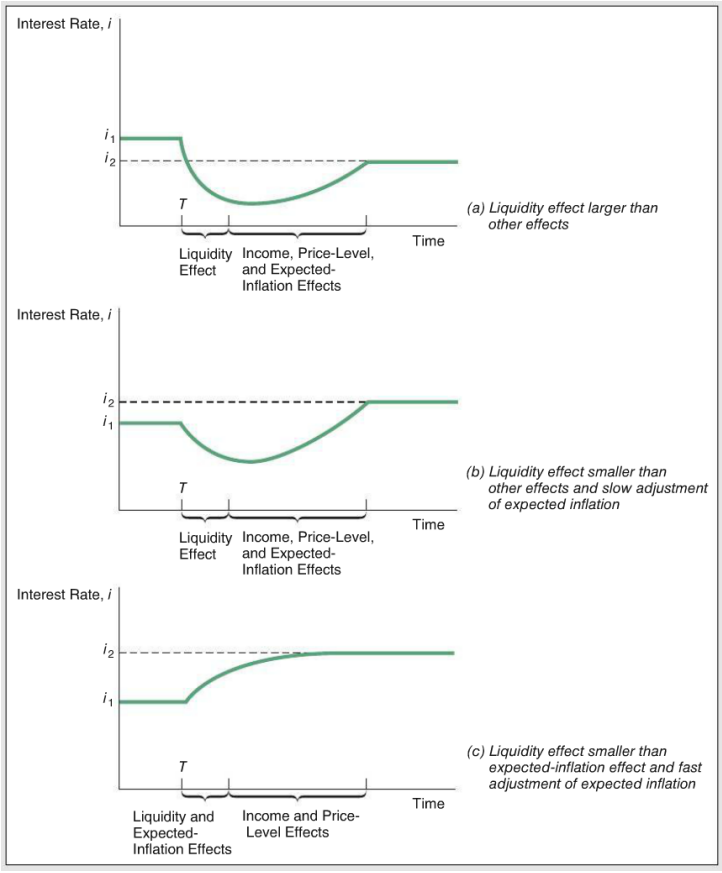
Md↑, i↑

Price-Level Effect: When the price level increases, interest rates will rise.

Md↑, i↑

Expected Inflation Effect: When expected inflation rate increases, interest rates will rise.

(i↑ = ir + πe↑)



a) Liquidity effect dominates the other effects so that the interest rate falls. The liquidity effect operates quickly to lower the interest rate, but as time goes by the other effects start to reverse some of the decline. Because the liquidity effect is larger than the others, the interest rate never rises back to its initial level.

b) Has a smaller liquidity effect that the other effects, with the expected inflation effect operating slowly because expectations of inflation are slow to adjust upward. Initially, the liquidity effect drives down the interest rate. Then the income, price-level, and expected inflation effects begin to raise it. Because these effects are dominant, the interest rate eventually rises above its initial level. In the short run, lower interest rates result from increased money growth, but eventually they end up climbing above the initial level.

c) Has the expected inflation effect dominating as well as operating rapidly because people quickly raise their expectations of inflation when the rate of money growth increases. The expected inflation effect begins immediately to overpower the liquidity effect, and the interest rate immediately starts to climb. Over time, as the income and price-level effects start to take hold, the interest rate rises even higher, and the eventual outcome is an interest rate that is substantially above the initial interest rate. The result shows clearly that increasing money supply growth is not the answer to reducing interest rates; rather, money growth should be reduces in order to lower interest rates!