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CHAPTER 2

The Financial Markets and Interest Rates

CHAPTER ORIENTATION

This chapter considers the market environment in which long-term capital is raised. The underlying rationale for the existence of security markets is presented, investment banking services and procedures are detailed, private placements are discussed, and recent security market regulation is reviewed. Further discussions cover rates of return over long periods of time and interest rates in recent periods, interest rate determinants, and theories of the term structure of interest rates.

CHAPTER OUTLINE

I. Financing of Business: The Movement of Funds Through the Economy

A. Capital can be transferred from saving-surplus units (those who spend less than they take in) to savings-deficit units (those who need additional funds) using one of three methods.

1. Direct transfer of funds—The firm seeking cash sells its securities directly to investors. These transfers may involve an **angel investor** (a wealthy private investor who provides capital for a business start-up) or a **venture capitalist** (an investment firm or individual investor that provides money to business start-ups).

2. Indirect transfer using an investment bank—An investment bank buys the entire issue of securities from the firm seeking funds and then sells them at a higher price to the investing public.

3. Indirect transfer using financial intermediaries—A financial intermediary (e.g., life insurance companies, mutual funds, or pension funds) collects the savings of individuals and issues its own securities to these savers. The intermediary then invests the accumulated funds in various securities.

B. Public Offerings Versus Private Placements

1. The public financial market is an impersonal market in which both individual and institutional investors have the opportunity to acquire securities.

a. A **public offering** is a security offering where all investors have the opportunity to acquire a portion of the securities being sold in the public market.

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b. The security-issuing firm does not meet the actual investors in the securities face-to-face.

2. In a **private placement** of securities, only a limited number of investors have the opportunity to purchase a portion of the issue.

   a. The market for private placements is more personal than its public counterpart.

   b. The specific details of the issue may actually be developed on a face-to-face basis among the potential investors and the issuer.

3. Private placements and venture capital

   a. Private placements can involve issuing both debt and equity, and venture capitalists can play an active role in both placements.

   b. For start-up companies or companies in the early stages of business, as well as firms in "turnaround" situations, venture capital is a prime source of funds. The venture capital firm will frequently acquire a meaningful dollar stake in the start-up firm.

C. Primary Markets Versus Secondary Markets

1. Securities are first offered for sale in the **primary market**. For example, the sale of a new bond, preferred stock, or common stock issue takes place in the primary market. These transactions increase the total stock of financial assets in existence within the economy.

2. Trading in currently existing securities takes place in the **secondary market.** The total stock of financial assets is unaffected by such transactions.

D. The Money Market Versus the Capital Market

1. The **money market** consists of the institutions and procedures that provide for transactions in short-term debt instruments that are generally issued by borrowers who have very high credit ratings.

   a. "Short-term" means that the securities traded in the money market have maturity periods of not more than one year.

   b. Equity instruments are not traded in the money market.

   c. Typical examples of money market instruments are (l) U.S. Treasury bills, (2) federal agency securities, (3) bankers' acceptances, (4) negotiable certificates of deposit, and (5) commercial paper.

2. The capital market consists of the institutions and procedures that provide for transactions in long-term financial instruments. This market encompasses those securities that have maturity periods exceeding one year.

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E. Spot Markets Versus Futures Markets

1. Cash markets are markets where something sells today, right now, on the spot; in fact, cash markets are often referred to as **spot markets.**

2. **Futures markets** are markets where you can set a price to buy or sell something at some future date; in effect, you sign a contract that states what you are buying, how much of it you are buying, at what price you are buying it, and when you will actually make the purchase.

F. Stock Exchanges: Organized Security Exchanges Versus Over-the-Counter Markets, A Blurring Difference

1. Because of the technological advances during the past 25 years, coupled with deregulation and increased competition, the difference between an organized exchange and the over-the-counter market has blurred. **Organized security exchanges** are tangible entities that facilitate the trading of securities. Their activities are governed by a set of bylaws. **Security exchanges** physically occupy space, and financial instruments are traded on the premises.

2. Stock Exchange Benefits. Both corporations and investors enjoy several benefits provided by the existence of organized security exchanges. These include the following:

   a. Providing a continuous market. A continuous market provides a series of continuous security prices, resulting in smaller price changes from trade to trade.

   b. Establishing and publicizing fair security prices. An organized exchange permits security prices to be set by competitive forces with the specific price of a security is determined in the manner of an auction.

   c. Helping business raise new capital. Because a continuous secondary market exists, it is easier for firms to float, or issue, new security offerings at competitively determined prices.

II. Selling Securities to the Public

The **investment banker** is a financial specialist who acts as an intermediary in the selling of securities. He or she works for an investment banking firm (house).

A. The investment banker provides three basic functions.

1. The investment banker assumes the risk of selling a new security issue at a satisfactory (profitable) price. This is called **underwriting**. Typically, the investment banking house, along with the underwriting syndicate, actually buys the new issue from the corporation that is raising funds. The syndicate (group of investment banking firms) then sells the issue to the investing public at a higher price than it paid (one hopes).

2. The investment banker provides for the **distribution** of the securities to the investing public.

3. The investment banker **advises** firms on the details of selling securities.

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B. Distribution Methods

Several distribution methods are available for placing new securities into the hands of final investors. The investment banker's role is different in each case.

1. In a **negotiated purchase,** the firm in need of funds contacts an investment banker and begins the sequence of steps leading to the final distribution of the offered securities. The price that the investment banker pays for the securities is negotiated with the issuing firm individually.
2. In a **competitive bid purchase,** the investment banker and underwriting syndicate are selected by an auction process. The syndicate willing to pay the issuing firm the greatest dollar amount per new security wins the competitive bid. This means that it will underwrite and distribute the issue. In this situation, the price paid to the issuer is not negotiated; instead, it is determined by a sealed-bid process, much on the order of construction bids.
3. In a **commission** (or **best-efforts**) offering, the investment banker does not act as an underwriter. He or she attempts to sell the issue in return for a fixed commission on each security that is actually sold. Unsold securities are simply returned to the firm that was hoping to raise funds.
4. In a **privileged subscription,** the new issue is not offered to the investing public. It is sold to a definite and limited group of investors. Current stockholders are often the privileged group.
5. In a **Dutch auction,** investors first put in bids giving the number of shares they would like to buy and the price they are willing to pay for them. Once in, the bids are ranked, and the selling price is calculated as the highest price that allows all the stock to be sold.
6. In a **direct sale,** the issuing firm sells the securities to the investing public without involving an investment banker. This is not a typical procedure.

C. Private Debt Placements

1. Each year, billions of dollars of new securities are privately (directly) placed with final investors. In a private placement, a small number of investors purchase the entire security offering. Most private placements involve debt instruments.
2. Large financial institutions are the major investors in private placements. These include (l) life insurance firms, (2) state and local retirement funds, and (3) private pension funds.
3. The advantages and disadvantages of private placements as opposed to public offerings must be carefully evaluated by management.
   a. The advantages include (l) greater speed than a public offering in actually obtaining the needed funds, (2) lower flotation costs than are associated with a public issue, and (3) increased flexibility in the financing contract.
   b. The disadvantages include (l) higher interest costs than are ordinarily associated with a comparable public issue, (2) the imposition of several restrictive covenants

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in the financing contract, and (3) the possibility that the security may have to be registered some time in the future at the lender's option.

D. Flotation Costs

1. The firm raising long-term capital typically incurs two types of **flotation costs:** (l) the underwriter's spread and (2) issuing costs. The former is typically the larger.

   a. The underwriter's spread is the difference between the gross and net proceeds from a specific security issue. This absolute dollar difference is usually expressed as a percentage of the gross proceeds.

   b. Many components comprise issue costs. The two most significant are (l) printing and engraving and (2) legal fees. For comparison purposes, these costs are usually expressed as a percentage of the issue's gross proceeds.

2. SEC data reveal two relationships about flotation costs.

   a. Issue costs (as a percentage of gross proceeds) for common stock exceed those of preferred stock, which in turn exceed those of bonds.

   b. Total flotation costs per dollar raised decrease as the dollar size of the security issue increases.

E. Regulation Aimed at Making the Goal of the Firm Work: The Sarbanes-Oxley Act

1. In July 2002, Congress passed the Public Company Accounting Reform and Investor Protection Act. The short name for the act became the Sarbanes-Oxley Act of 2002.

   a. The Sarbanes-Oxley Act was passed as the result of a large series of corporate indiscretions.

   b. The act holds corporate advisors (e.g., accountants, lawyers, company officers, and boards of directors) who have access to or influence over company decisions strictly accountable in a legal sense for any instances of misconduct.

III. Rates of Return in the Financial Markets

A. Rates of Return Over Long Periods

Although interest rates are presently at historically low levels and stock prices have been extremely volatile since 2007, the following relationships have been observed over the longer run (88 years from 1926 to 2014):

1. The average inflation rate (the "inflation-risk premium") has been about 3.0 percent annually.

2. The default-risk premium for long-term corporate bonds over long-term government bonds has between about 0.4 percent annually.

3. Large common stocks earned 4.0 percent more than the rate earned on long-term corporate bonds.

B. Interest Rate Levels in Recent Periods

1. The **nominal (or quoted) rate of interest** is the interest rate paid on debt securities without an adjustment for inflation.

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2. An **inflation premium** is the additional return required by investors to compensate for inflation expected to occur over the life of the investment.
3. The **default-risk premium** is the additional return required by investors to compensate for the risk of default.
4. The **maturity-risk premium** is another factor that affects interest rate levels and arises even if a security possesses equal odds of default. It is the additional return required by investors in longer-term securities to compensate for a greater risk of price fluctuations on these securities due to changes in interest rates.
5. The **liquidity-risk premium** also determines interest rate levels. It is the additional return required by investors for securities that cannot be converted into cash quickly without a substantial loss in value.

IV. Interest Rate Determinants in a Nutshell

A. The interest rate on a security is equal to the real risk-free interest rate plus compensation for taking on different types of risk (measured by risk premiums).

1. The real risk-free interest rate is the required rate of return on a fixed-income security that has no risk in an economic environment of zero inflation. It is one component of the nominal interest rate.
2. The nominal rate of interest can be expressed as,

   nominal interest rate = real risk-free interest rate
   + inflation premium
   + default-risk premium
   + maturity-risk premium
   + liquidity-risk premium (2-1)

B. Estimating Specific Interest Rates Using Risk Premiums

C. Real Risk-Free Interest Rate and the Risk-Free Interest Rate

1. In economics and finance, the term "real" means that the variable has been adjusted for inflation.
2. Thus, the real interest rate is an inflation-adjusted risk-free interest rate.
3. Real risk-free interest rate ≈ risk-free interest rate – inflation premium

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D. Real and Nominal Rates of Interest

1. The **real rate of interest** is the difference in the nominal rate and the anticipated rate of inflation.
2. It tells you how much more purchasing power you have.
3. An approximation of the nominal interest rate is given by the following equation:

   Nominal interest rate ≈ real rate of interest + inflation premium (2-2)

4. The exact relationship between the nominal interest rate, the rate of inflation, and the real rate of interest is expressed by the following equation:

   (1 + nominal interest rate) = (1 + real rate of interest)(1 + rate of inflation) (2-3)

   or

   nominal rate of interest = real rate of interest + anticipated rate of inflation + [(real rate of interest)(anticipated rate of inflation)]

   For example, if the real rate is 5 percent and the expected inflation rate is 4 percent, the nominal rate would then be 9.2 percent, computed as follows:

   nominal rate of interest = 0.05 + 0.04 + (0.05)(0.04)

   = 0.092 or 9.2%

E. Inflation and Real Rates of Return: The Financial Analyst's Approach

1. Practicing analysts and executives employ an approximation method to estimate the real rate of interest over a selected past time frame.
2. This approximation is given in the following equation:

   Nominal interest rate – inflation rate ≈ real interest rate

F. The Term Structure of Interest Rates

1. The relationship between a debt security's rate of return and the length of time until the debt matures is known as the **term structure of interest rates** or the **yield curve**.

G. Shifts in the Term Structure of Interest Rates

1. The term structure of interest rates changes over time, depending on the environment.
2. The particular term structure observed today may be quite different from the term structure one month ago and different still from the term structure one month from now.
3. The term structure reflects observed rates or yields on similar securities, except for the length of time until maturity, at a particular moment in time.

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H. What Explains the Shape of the Term Structure?

Three theories are commonly used to explain the term structure of interest rates.

1. The **unbiased expectations theory** says that the term structure is determined by investors' expectations about future interest rates.
2. The **liquidity preference theory** proposes that investors require liquidity premiums (additional returns) to compensate them for buying securities that expose them to a greater risk of changes in market value due to fluctuating interest rates.
3. The **market segmentation theory** proposes that legal restrictions and personal preferences limit investment choices to certain ranges of maturities. Thus, the interest rate observed is determined solely by supply and demand conditions for securities of a given maturity.

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ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

2-1. The **money market** consists of all institutions and procedures that accomplish transactions in short-term debt instruments (those claims with maturities up to one year) that are issued by borrowers with (typically) high credit ratings. Examples of securities traded in the money market include U.S. Treasury bills, bankers' acceptances, and commercial paper. Notice that all of these are debt instruments. Equities are not traded in the **money market**. The money market is entirely an over-the-counter market. On the other hand, the **capital market** provides for transactions in long-term financial claims (those claims with maturity periods extending beyond one year). The capital market includes both debt and equity securities. Trades in the capital market can take place on organized exchanges or over-the-counter.

2-2. Organized stock exchanges provide for the following:

(1) A continuous market. This means a series of continuous security prices is generated. Price changes between trades are dampened, reducing price volatility, and enhancing the liquidity of securities.

(2) Establishing and publicizing fair security prices. Prices on an organized exchange are determined in the manner of an auction. Moreover, the prices are published in widely available media, like newspapers.

(3) An aftermarket to aid businesses in the flotation of new security issues. The continuous pricing mechanism provided by the exchanges facilitates the determination of offering prices in new flotations. The initial buyer of the new issue has a ready market in which he can sell the security should he need liquidity rather than a financial asset.

2-3. Because most NYSE stocks trades take place electronically rather than on the floor of the exchange, the difference between an organized exchange and the over-the counter market has lost much of its meaning. The statement is correct. However, Listing requirements (e.g., size or earnings minimums) as well as the potential liquidity of assets traded during times of market crises still differ .

2-4. Most bonds are traded among very large financial institutions. Life insurance companies and pension funds are typical examples. These institutions deal in large quantities (blocks) of securities. An over-the-counter bond dealer can easily bring together a few buyers and sellers of these large quantities of bonds. By comparison, common stocks are owned by millions of investors. Organized exchanges are necessary to accomplish the "fragmented" trading in equities.

2-5. The investment banker is a middleman involved in the channeling of savings into long-term investment. He performs the functions of (1) underwriting, (2) distributing, and (3) advising. By assuming underwriting risk, the investment banker and his syndicate purchase the securities from the issuer and hope to sell them at a higher price. Distributing the securities means getting those financial claims into the hands of the ultimate investor. This is accomplished through the syndicate's selling group. Finally, the

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investment banker can provide the corporate client with sound advice on which type of security to issue, when to issue it, and how to price it.

2-6. In a negotiated purchase, the corporate security issuer and the managing investment banker negotiate the price that the investment banker will pay the issuer for the new offering of securities. In a competitive-bid situation, the price paid to the corporate security issuer is determined by competitive (sealed) bids, which are submitted by several investment banking syndicates, each hoping to win the right to underwrite the offering.

2-7. Investment banking syndicates are established for three key reasons: (1) the investment bank that originates the business probably cannot afford to purchase the entire new issue itself; (2) the risk of loss is spread among several underwriters; and (3) the distribution network is widened.

2-8. Several positive benefits are associated with private placements. The first is **speed**. Funds can be obtained quickly, primarily due to the absence of a required registration with the SEC. Second, flotation **costs** are lower compared to public offerings of the same dollar size. Third, greater financing **flexibility** is associated with the private placement. All of the funds, for example, need not be borrowed at once. They can be taken down over time. Also, elements of the debt contract can be renegotiated during the life of the loan.

2-9. As a percentage of gross proceeds, flotation costs are inversely related to the dollar size of the new issue. In addition, common stock is more expensive to issue than preferred stock, which is more expensive to issue than debt.

2-10. First, savings may be directly transferred from the investor to the borrower. Second, an indirect transfer might use the services provided by an investment banker. Third, an indirect transfer might use the services of a financial intermediary, such as private pension funds and life insurance companies.

2-11. As a net user of funds, a firm must raise funds in the financial markets, either in the form of debt or of equity. Because other entities will be in need of funds, including both businesses and governments, the firm must offer the investor a return that is attractive, given the investor's best alternative investment opportunity. Otherwise, the investor will not be interested in purchasing the company's bonds or stocks. Thus, the cost of money to the firm will invariably be determined by the investor's best alternative opportunity for the given level of risk being assumed—that is, the investor's opportunity cost. We should never base our decisions on past or historical costs, even when they represent the actual out-of-pocket costs to the firm. Maximizing shareholder wealth means that we make decisions based upon our understanding of the investor's best alternative opportunities. In the case of investment and financing decisions, the opportunity cost for the firm's investors is captured in the rates of return available in the financial markets.

2-12. Historically, returns of different types of securities have followed the risk-return relationship that securities with higher levels of risk produce: higher returns. Short-term treasury bills typically have the lowest risk and lowest return, while bonds, on average, have an intermediate level of risk and an intermediate rate of return. Common stocks, on average, have higher levels of risk and higher rates of return.

2-13. We may think of the difference in the nominal rate and real rate of return as the

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"inflation premium." As the expected rate of inflation increases, investors will demand a higher rate of return (a higher inflation premium) to compensate for the potential loss of purchasing power.

2-14. The term structure of interest rates represents the relationship between a debt security's rate of return and the length of time until the debt matures. For the relationship to be meaningful, all factors other than maturity, such as the chance of the bond defaulting, must be held constant.

2-15. The chapter gives three theories for explaining the term structure of interest rates: (1) the unbiased expectations theory, (2) the liquidity preference theory, and (3) the market segmentation theory.

(1) The unbiased expectations theory states that the term structure is determined by an investors' expectations about future interest rates. If interest rates are expected to be higher in the future, securities with longer maturities will carry a higher interest rate (and vice versa). Looking at the current term structure of interest rates, we can estimate what investors should expect future interest rates to be. For instance, if we know the current interest rates for securities maturing in one and two years, we can estimate what rate investors expect on a similar security issued one year from now with a one-year maturity date.

(2) According to the liquidity preference theory, investors require a liquidity premium to compensate for buying longer-term securities that expose them to the risks of fluctuating future interest rates.

(3) The market segmentation theory proposes that legal restrictions and personal preferences limit investors' investment choices to certain ranges of maturities. For example, commercial banks prefer short- to medium-term maturities as a result of their short-term deposit liabilities. They simply do not like to invest in long-term securities. Life insurance companies, on the other hand, have longer-term liabilities, so they prefer longer maturities when they invest. The market segmentation theory implies that the rate of interest for a particular maturity is determined solely by demand and supply conditions for a given maturity and is independent of the demand and supply conditions for securities having different maturities.

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SOLUTIONS TO END-OF-CHAPTER STUDY PROBLEMS

2-1. We know that NI = RI + IP + DP + MP + LP, where:

NI = Nominal interest rate
RI = Real risk-free interest rate
IP = Inflation premium
DP = Default-risk premium
MP = Maturity-risk premium
LP =Liquidity-risk premium
k = Nominal rate of return

$k_{10\text{-year Treasury bond}}$ = 4% = RI + IP + DP + MP + LP; where DP = 0 and LP = 0 (remember, this is a Treasury security, so it should have no DP or LP)

Thus, $k_{10\text{-year }\mathbf{Treasury\ bond}}$ = 4% = RI + IP + MP

$k_{10\text{-year }\mathbf{Corporate\ bond}}$ = 6.8% = RI + IP + DP + MP + 0.4%

Because both bonds are 10-year bonds, they should have the same inflation premium (IP) and the same maturity-risk premium (MP). Thus, we can substitute 4% = RI + IP + MP into the 10-year corporate bond interest rate formula,

$k_{10\text{-year Corporate bond}}$ = 6.8% = RI + IP + DP + MP + 0.4%

$k_{10\text{-year Corporate bond}}$ = 6.8% = 4% + DP + 0.4%

Thus, DP = = 6.8% – 4% – 0.4% = 2.4%

2-2. Let NI = nominal rate

RI = real risk-free rate

IP = inflation premium

DP = Default-risk premium

MP = Maturity-risk premium

LP = Liquidity-risk premium

Because this is a Treasury security, there is not a default-risk premium (DP) or liquidity-risk premium (LP), thus,

$k_{2\text{-year Treasury bond}}$ = 4.5% = RI + IP + MP

4.5% = 2% + 2% + MP

Thus, MP = 4.5% – 2% – 2% = 0.5%

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2-3. According to the problem, we are given the following information:
Nominal (quoted) rate of return = 8%
Real rate of return = 6%

The formula for the calculation of the expected inflation is:
(1 + Expected Inflation Rate) = (1 + Nominal Rate)/(1 + Real Rate of Return)

Solving this, we see that:
(1 + Expected Inflation Rate) = (1.08)/(1.06)

(1 + Expected Inflation Rate) = 1.0189

Expected Inflation Rate = 0.0189 or 1.89%

2-4. If k = nominal rate
k* = real rate
IRP = inflation rate
then, k = k* + IRP + (IRP)(k*)
k = 0.04 + 0.07 + (0.07)(0.04) = 0.1128 = 11.28%

2-5. If k = nominal rate
k* = real rate
IR = inflation rate
then, k = k* + IR + (IR)(k*)
k = 0.06 + 0.04 + (0.06)(0.04) = 0.1024 = 10.24%

2-6. The difference between the nominal yield and the inflation rate indicates the inferred real interest rate, which can serve as an approximation of the increase in real purchasing power over the study period. Those calculations are shown below.

Security	Nominal Yield %	Inflation Rate %	Inferred Real Rate %
Treasury bill	4.34	2.78	1.56
Treasury bonds	7.33	2.78	4.55

The 30-year real rate exceeds the three-month real rate because of the maturity premium demanded by investors.

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2-7. Ignoring the cross-product involves using the simple arithmetic calculation for the real rate of interest, rather than the geometric calculation for the real rate of interest.

Nominal (quoted) rate of return = 4.5%
Expected Inflation Rate = 2.1%
The formula for the Expected Real Rate if one ignores the cross product is:
Expected Real Rate ≈ Nominal (quoted) Rate of Return – Expected Inflation Rate

Entering in our variables, we see that

Expected Real Rate ≈ 4.5% – 2.1%
Expected Real Rate ≈ 2.4%

2-8. Real Risk-free Rate = 4.8%
Expected Rate of Inflation = 3.1%
Expected Rate of Return = 4.8% + 3.1% = 7.9%

2-9. In this problem, we are implicitly assuming the same inflation premium for each bond and that there are no tax differences between the bonds.

20-year Treasury Bonds:
Yield = 5.1%
Liquidity-risk premium = 0.0%

20-year corporate bonds:
Yield = 9.1%
Liquidity-risk premium = 0.25%

Default-risk premium = 9.1% – 5.1% – 0.25% = 3.75%

2-10. Real risk-free interest rate = 4.9% – 2.1% – 0.3% = 2.5%

2-11. We are told that

Real risk-free interest rate = 2.5%
Inflation rate = 2.0%

We have learned that NI = RI + IP + DP + MP + LP, where:
NI = Nominal interest rate
RI = Real- risk free interest rate
IP = Inflation premium
DP = default-risk premium
MP = maturity-risk premium
LP =Liquidity-risk premium

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As there is no default-risk premium or liquidity-risk premium, the nominal interest rate will be a function of the other three variables.

0–1 year: 2.5% + 0.05% + 2.0% = 4.55%
1–2 years: 2.5% + 0.30% + 2.0% =4 .80%
2–3 years: 2.5% + 0.60% + 2.0% = 5.10%
3–4 years: 2.5% + 0.90% + 2.0% = 5.40%

2-12. We are told that

Real risk-free interest rate = 3.0%
Expected inflation rate = 3.0%
Default-risk premium = 1.5%
Liquidity-risk premium = 0.02%

Furthermore, we have learned that NI = RI + IP + DP + MP + LP, where:

NI = Nominal interest rate
RI = Real risk-free interest rate
IP = Inflation premium
DP = Default-risk premium
MP = Maturity-risk premium
LP =Liquidity-risk premium

Using the information given above, we come up with the following nominal rates:

0–1 year: 3.0% + 3.0% + 1.5% + 0.02% + 0.07% = 7.59%
1–2 years: 3.0% + 3.0% + 1.5% + 0.02% + 0.35% = 7.87%
2–3 years: 3.0% + 3.0% + 1.5% + 0.02% + 0.70% = 8.22%
3–4 years: 3.0% + 3.0% + 1.5% + 0.02% + 1.00% = 8.52%

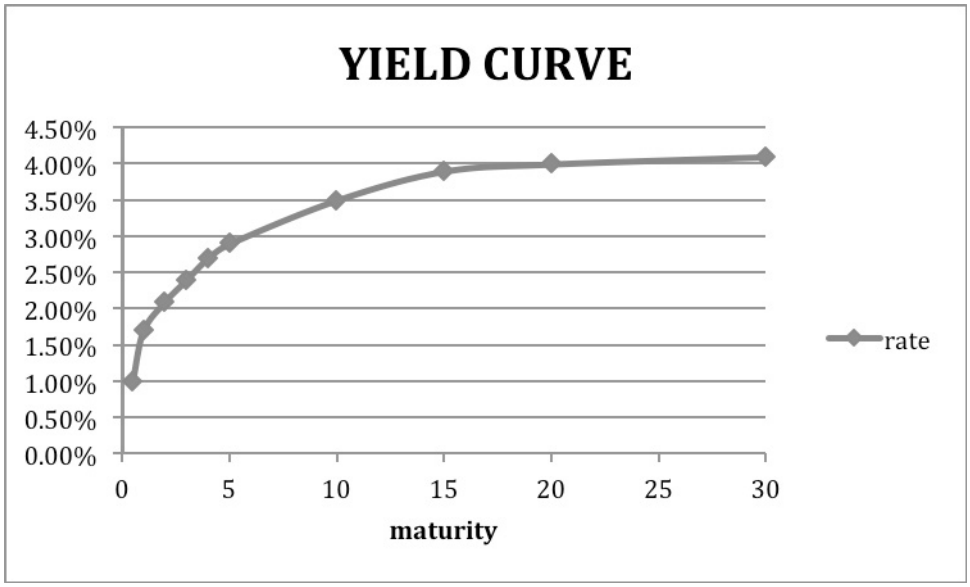
2-13. a. If you invest in the two-year security, you will have saved $23,328 ($20,000 × 1.08 × 1.08) by the end of the second year. If you invest in the one-year security, you will have saved $21,200 ($20,000 × 1.06) by the end of the first year. To do as well as you would with the first choice, you would have to earn $2,128 in interest in the second year ($23,328 – $21,200). That means you would have to earn 10 percent ($2,128/$21,200) on the investment purchased in the second year, if you want to be as well off in the second year as you would be from buying the two-year security. Thus, you would invest in the one-year security paying 6 percent only if you believed you could earn at least 10 percent in the second year on a security issued at the beginning of the second year. The forgoing logic is based on the unbiased expectations theory of term structure of interest rates.

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b. If you require an 11 percent rate on the second one-year investment, then the unbiased expectations theory is not fully explaining the term structure of interest rates. The unbiased expectations theory suggests you should accept 10 percent in year two. Thus, you are requiring a liquidity premium on the second-year investment to compensate for the uncertainty of the future interest rates in year two.

2-14.



Unbiased expectation theory:

— This theory proposes that the slope of the yield curve is based solely on expected future rates. The rise in the yield curve over the next five years is based on expectations by investors that prevailing interest rates in the market will rise.

Liquidity preference theory:

— This theory proposes that investors have a preference toward more liquid investments. Borrowers like to lock in interest rates so that they don't suffer if interest rates go up and the debt has to be refinanced at a higher interest rates. Lenders prefer shorter-term investments so that they do not suffer large capital losses on their investments if interest rates increase.

— Therefore, any yield curve is a combination of expected future rates and a "liquidity premium" for longer-term investment. Thus, we cannot say what the shape of the yield curve means. Due to the liquidity premium, an upward-sloping yield curve is consistent with expectations for rising, falling, or unchanged future short-term rates.

2-15. If you invest the money for two years at 3.5 percent, you will earn 3.5 percent in year one, so your $50,000 will grow by $1,750 (that is 3.5 percent of $50,000) to $51,750, and it will grow another 3.5 percent in year two. Because 3.5% of $51,750 is $1,811.25, your total at the end of two years would be $53,561,25. If you put your money in a one-year security paying 3 percent, you would have $51,500 at the end of one year. To make these

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two alternatives equivalent, you would need to earn $53,561.25 – $51,500 or $2,061.25 during year two. Thus, if you begin year two with $51,500 and need it to grow by $2,061.25, you would need to earn $2,061.25/$51,500 or 4 percent in year two.

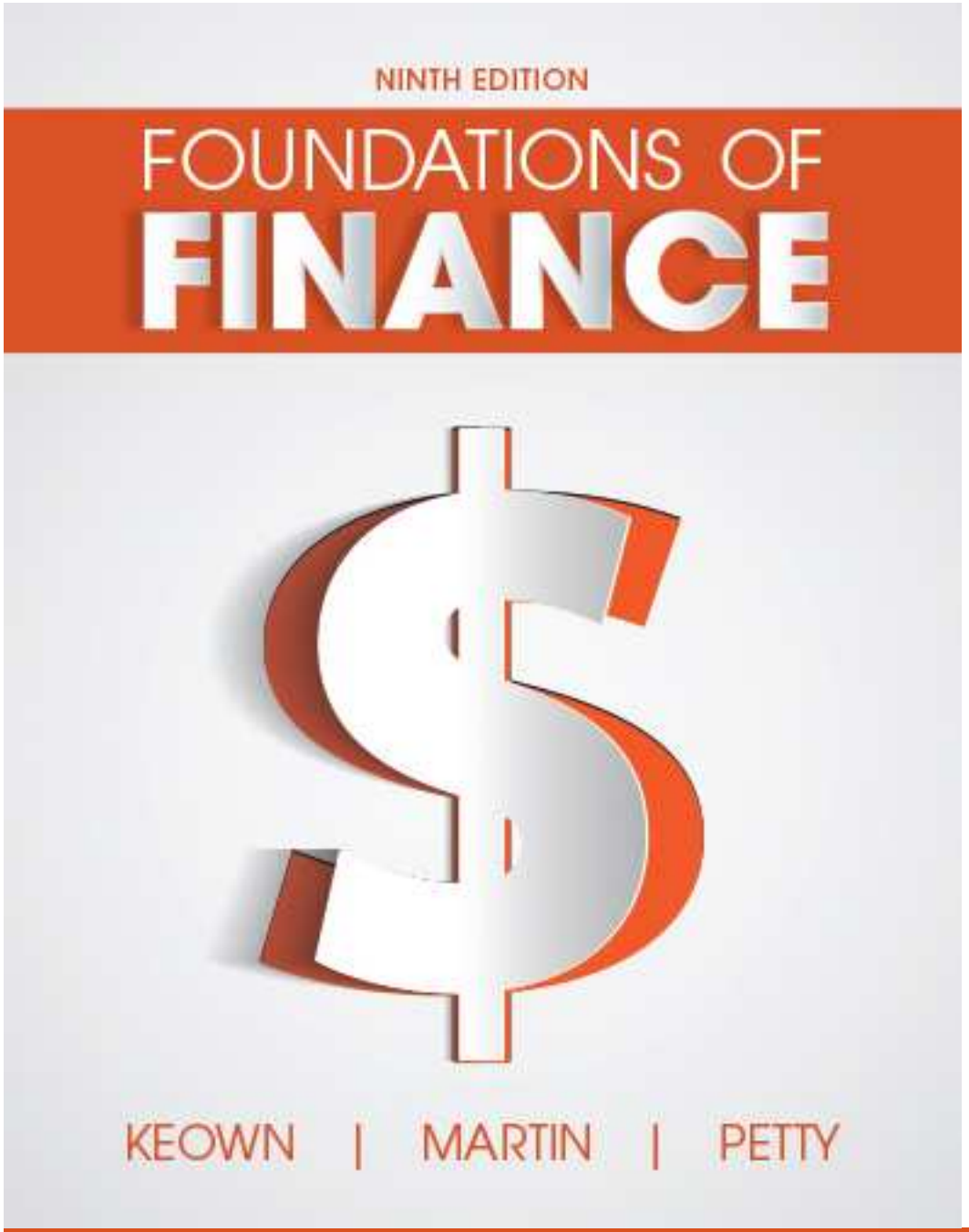
SOLUTION TO MINI CASE

a. Information is given for the Mini Case.
b. Real risk-free interest rate = 2.96% – 2.33% = 0.63%
c. Default-risk premium = 6.71% – 5.43% = 1.28%
d. Maturity-risk premium = 5.43% – 2.96% = 2.47%
e. Liquidity-risk premium = 0.04%

Real risk-free interest rate	0.63%
+	+
Inflation premium	2.33%
+	+
Default-risk premium	1.28%
+	+
Maturity-risk premium	2.47%
+	+
Liquidity-risk premium	0.04%
=	=
Nominal interest rate	6.75%

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Chapter 2

The Financial Markets and Interest Rates



Learning Objectives

- Describe key components of the U.S. financial market system and the financing of business.
- Understand how funds are raised in the capital markets.
- Be acquainted with recent rates of return.
- Explain the fundamentals of interest rate determination and the popular theories of the term structure of interest rates.

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FINANCING OF BUSINESS: THE MOVEMENT OF FUNDS THROUGH THE ECONOMY

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Financial Markets: Transfer of Capital

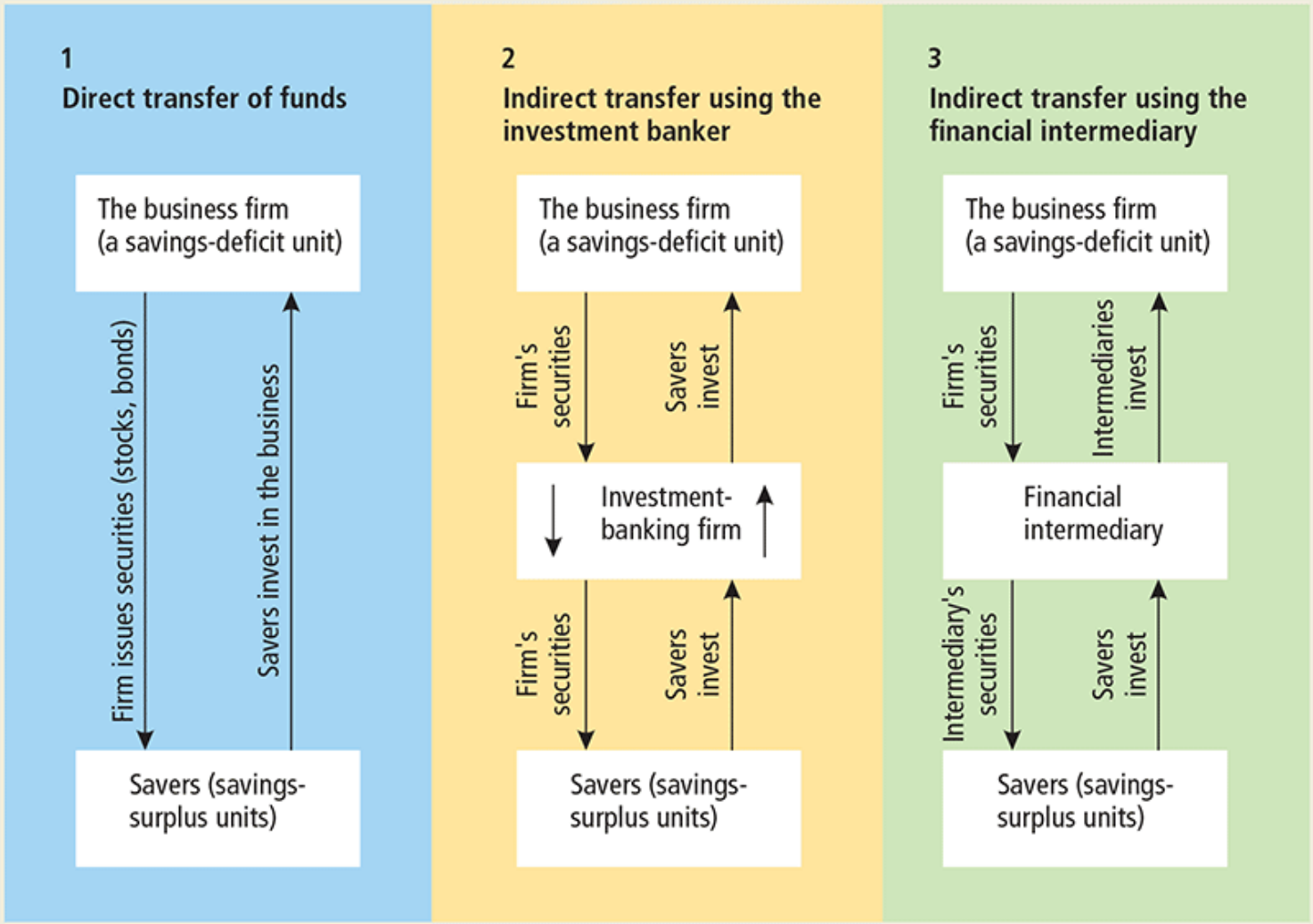
- Financial markets play a critical role in capitalist economy. Financial markets help facilitate the transfer of funds from “saving surplus” units to “saving deficit” units, i.e., transfer money from those who have the money to those who need it.
- See Figure 2-1 for three ways to transfer capital in the economy:
  - Direct transfer
  - Indirect transfer using the investment banker
  - Indirect transfer using the financial intermediary

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FIGURE 2-1 Three Ways to Transfer Capital in the Economy



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Direct Transfer

Direct Transfer

Firm seeking funds directly approaches a wealthy investor.

- For example, a new business venture seeking funding from venture capitalist.

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Role of Venture Capitalist

- Venture capitalist are the prime source of funding for start-up companies and companies in “turnaround” situations. Funding for such ventures are very risky, but carry the potential for high returns.
- The borrowing firm may not have the option of pursuing public offering due to: small size, no record of profits, and uncertain future growth prospects.

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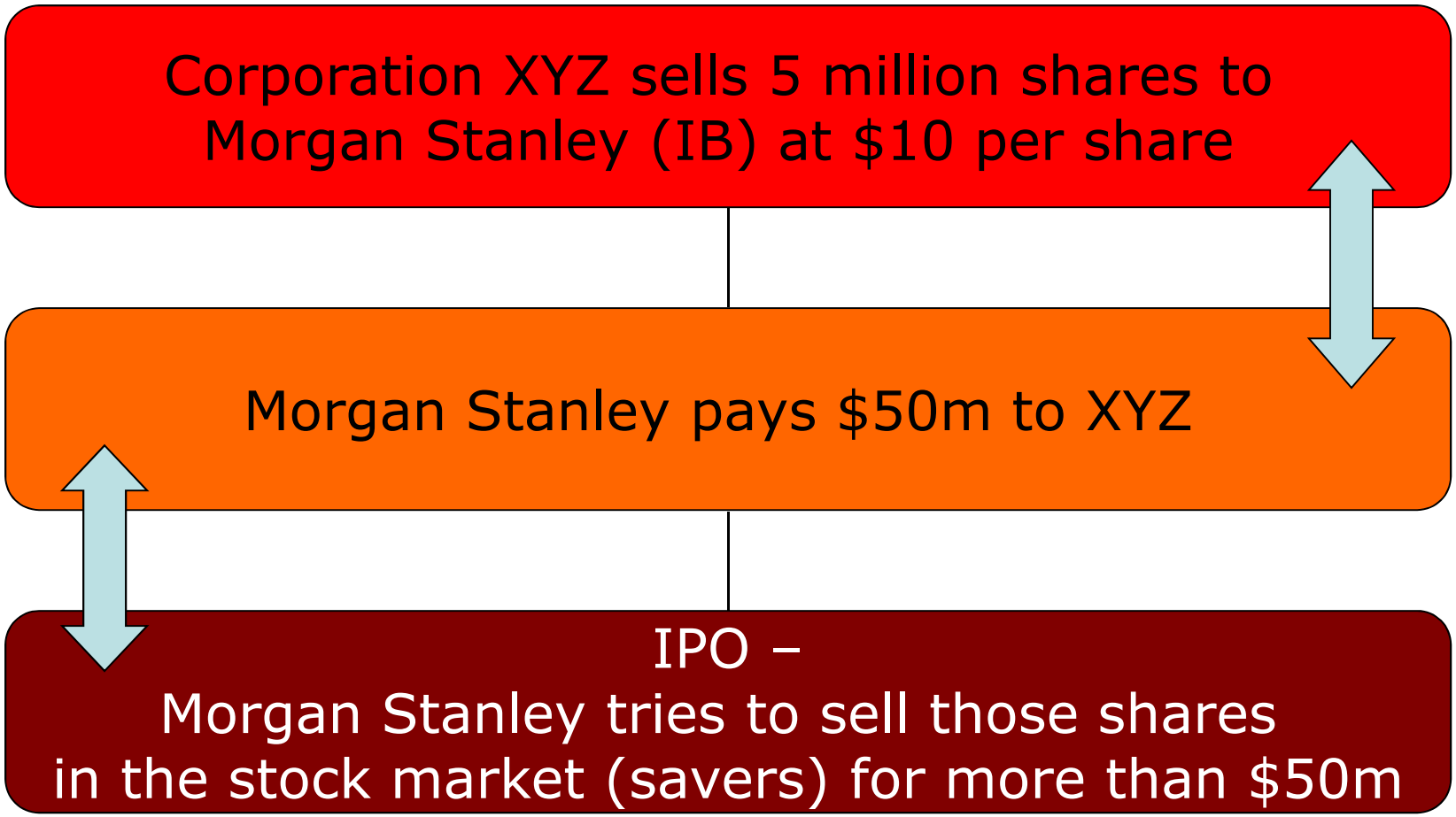
Indirect Transfer

Indirect Transfer (using investment banks)

Here the investment bank acts as a link between the firm (needing funds) and the investors (with surplus funds)

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Example of Transfer Using Investment Banks (IB)



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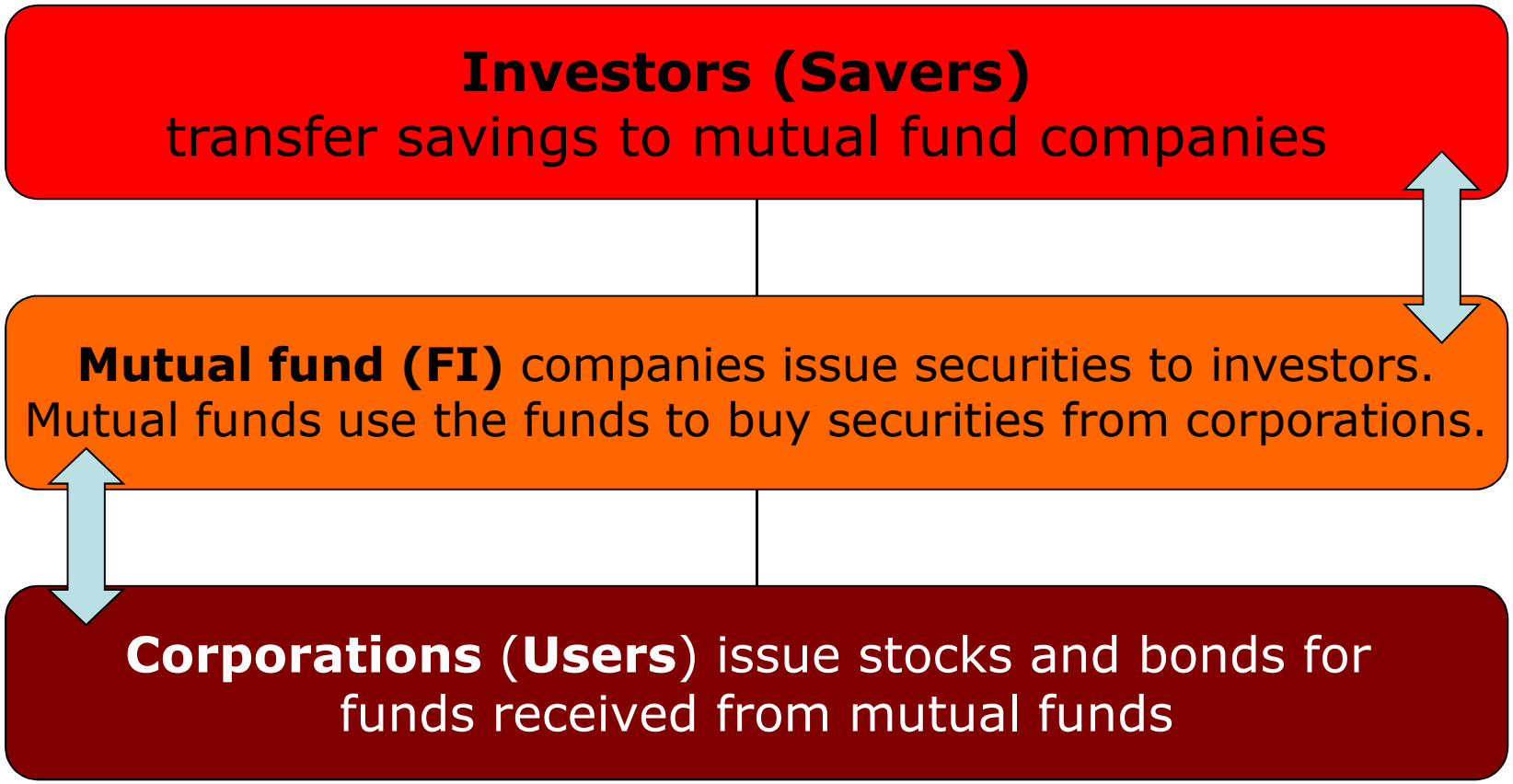
Indirect Transfer

Indirect transfer (using financial intermediary):

Here the financial intermediary (such as mutual funds) collects funds from savers in exchange of its own securities (indirect). The collected funds are then used to acquire securities (such as stocks and bonds) from firm.

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Indirect Transfer using Financial Intermediary (FI)



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Public Offerings Versus Private Placements

Public Offering

Both individuals and institutional investors have the opportunity to purchase securities. The securities are initially sold by the managing investment bank firm. The issuing firm never actually meets the ultimate purchaser of securities.

Private or Direct Placement

The securities are offered and sold directly to a limited number of investors.

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Primary Markets Versus Secondary Markets

Primary Market (initial issue)

This is the market in which new issues of a securities are sold to initial buyers. This is the only time the issuing firm ever gets any money for the securities. For example, Google raised $1.76 billion through sale of shares to public in August 2004.

Seasoned Equity Offering (SEO)

It refers to sale of additional shares by a company whose shares are already publicly traded. For example, Google raised $4.18 billion in September 2005.

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Primary Versus Secondary Markets (cont.)

Secondary Market (subsequent trading)

This is the market in which previously issued securities are traded. The issuing corporation does not get any money for stocks traded on the secondary market. For example, trading among investors today of Google stocks.

- Primary and secondary markets are regulated by SEC. Firms have to get approval from SEC before the sale of securities in primary market. Firms must report financial information to SEC on a regular basis (ex. financial statements) to protect investors.

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The Money Market Versus the Capital Market

Money Market

This is the market for short-term debt instruments (maturity periods of one year or less). Money market is typically a telephone and computer market (rather than a physical building).

Examples: Treasury bills (issued by federal government), commercial paper, negotiable CDs, bankers' acceptances.

Capital Market

This is the market for long-term financial securities (maturity greater than one year).

Examples: Corporate bonds, common stocks, Treasury bonds, term loans, and financial leases.

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Spot Markets Versus Futures Markets

Cash Markets

This is the market in which something sells immediately.

Futures Markets

This is the market for buying and selling at some future date.

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Organized Securities Exchanges

Organized Securities Exchanges are tangible entities and financial instruments are traded on its premises.

- New York Stock Exchange (NYSE, also known as "big board") is the oldest of all the organized exchanges. In 2015, the value of the shares of stock listed in the NYSE was over $22 trillion. The NYSE is a hybrid market allowing face-to-face and electronic trading.

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Over-the-Counter Markets

- If firms do not meet the listing requirements of the exchange, and/or wish to avoid higher reporting requirements and fees of exchanges, they may choose to trade on OTC.
- OTC (Over-the-Counter) market refers to all securities market except organized exchanges. There is no specific geographic location for OTC market. Most transactions are done through a network of security dealers who are known as broker-dealers and brokers. Their profit depends on the price at which they are willing to buy (bid price) and the price at which they are willing to sell (ask price).
- The most prominent OTC market for stocks is NASDAQ. NASDAQ lists over 5,000 securities (including Facebook, Apple, and Amazon). Most corporate bond transactions are also conducted on OTC markets.

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Stock Exchange Benefits

- Provides a continuous market
- Establishes and publicizes fair security prices
- Helps businesses raise new capital

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SELLING SECURITIES TO THE PUBLIC

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Investment Banking Function

Investment Banker/Underwriter

- They are financial specialists involved as an **intermediary** in the sale of securities (stocks and bonds). They buy the entire issue of securities from the issuing firm and then resell it to the general public.
- The difference between the price the corporation gets and the public offering price is called the **underwriter's spread**.
- Prominent investment banks in the U.S. include Goldman Sachs, JP Morgan, Morgan Stanley (see Table 2-1).

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TABLE 2-1 Underwriter Rankings for 2014

Rank	Underwriter	Proceeds (Millions)
1	Credit Suisse	$23,732.7
2	Morgan Stanley	$10,307.1
3	Citi	$7,953.4
4	BofA Merrill Lynch	$7,373.3
5	Goldman Sachs	$7,316.5
6	J.P. Morgan	$6,546.8
7	Barclays	$6,087.3
8	Jefferies & Co.	$1,756.8
9	Deutsche Bank	$1,284.9
10	Piper Jaffray	$587.1

Source: Adapted from Renaissance Capital—Manager of IPO-focused ETFs, Underwriter Rankings, http://www.renaissancecapital.com/ipohome/rankings/biggest.aspx, Renaissance Capital. "Underwriter Rankings for 2014." Copyright © 2014 Renaissance Capital, Greenwich, CT. Reprinted by permission. www.renaissancecapital.com.

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Functions of an Investment Banker

Underwriting:

- Underwriting means assuming risk. Since money for securities is paid to the issuing firm before the securities are sold, there is a risk to the investment bank(s).

Distributing:

- Once the securities are purchased from issuing firm, they are distributed to ultimate investors.

Advising:

- On timing of sale, type of security, etc.

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Distribution Methods

Negotiated Purchase

- Issuing firm selects an investment banker to underwrite the issue. The firm and the investment banker negotiate the terms of the offer.

Competitive Bid

- Several investment bankers bid for the right to underwrite the firm's issue. The firm selects the banker offering the highest price.

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Distribution Methods (cont.)

Best Efforts

- Issue is not underwritten, i.e., no money is paid upfront for the stocks. Investment bank, acting as an agent, attempt to sell the stocks in return for a commission.

Privileged Subscription

- Investment banker helps market the new issue to a select group of investors such as current stockholders, employees, or customers.

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Distribution Methods (cont.)

Dutch Auction

- Investors place bids indicating how many shares they are willing to buy and at what price. The price the stock is then sold for becomes the lowest price at which the issuing company can sell all the available shares.

- See Figure 2-2.

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FIGURE 2-2 A Dutch Auction Primer

A company is planning to use a Dutch auction to set the price of the shares in its initial public offering. Here is how the auction process will find the highest price at which all shares can be sold.

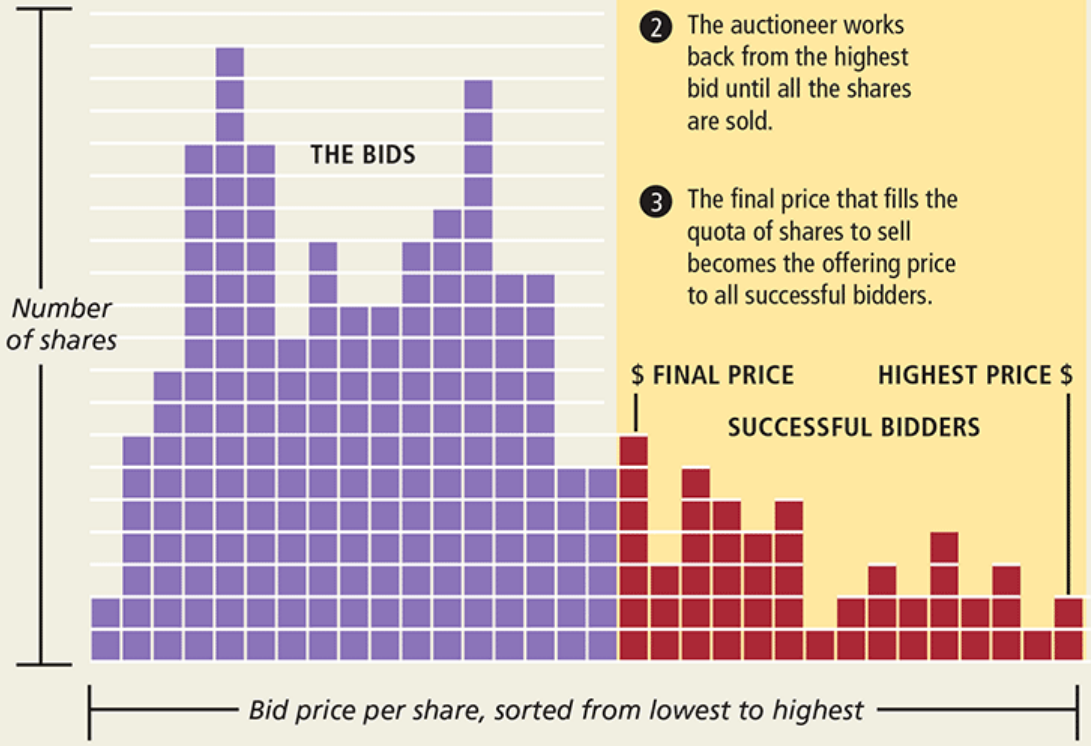
Adding it up

1. The auctioneer starts by gathering all the bids and sorting them according to price.

Setting the price

2. The auctioneer works back from the highest bid until all the shares are sold.

3. The final price that fills the quota of shares to sell becomes the offering price to all successful bidders.



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Distribution Methods (cont.)

Direct Sale

- Issuing firm sells the securities directly to the investing public.
- No investment banker is involved.

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Private Debt Placements

Private placements of debt refers to raising money directly from prominent investors such as life insurance companies, pension funds. It can be accomplished with or without the assistance of investment bankers.

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Private Debt Placements

Advantages

- Faster to raise money
- Reduces flotation costs
- Offers financing flexibility

Disadvantages

- Interest costs are higher than public issues
- Restrictive covenants
- Possible future SEC registration

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Flotation Costs

Flotation Costs refers to transaction costs incurred when a firm raises funds by issuing securities:

- Underwriter's spread
  (difference between gross and net proceeds)
- Issuing costs
  (printing and engraving of security certificates, legal fees, accounting fees, trustee fees, other miscellaneous expenses)

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Sarbanes-Oxley Act (SOX)

- In response to corporate scandals, Congress passed this Act in 2002.
- This Act holds senior corporate advisors (such as accountants, lawyers, board of directors, officers) responsible for any instance of misconduct.
- The Act attempts to protect the interest of investors by improving transparency and accuracy of corporate disclosures.
- SOX has been criticized for imposing additional compliance costs on the firms. Some firms have responded by delisting from major exchanges or choosing to list on foreign exchanges.

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RATES OF RETURN IN THE FINANCIAL MARKETS

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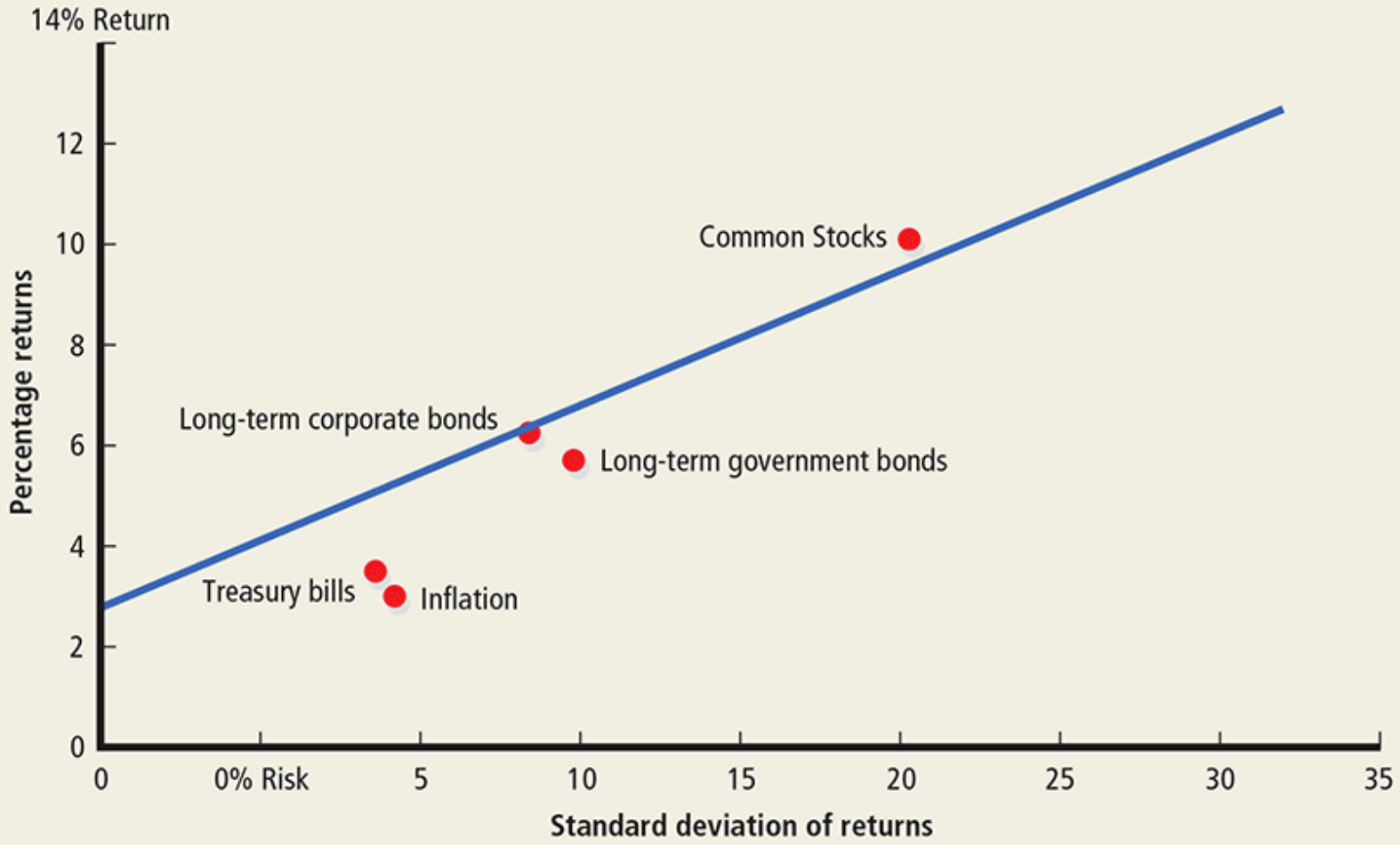


Long-term Rates of Return

- See Figure 2-3.
- Higher returns are associated with higher risk.
- Figure also shows that investors demand compensation for inflation and other elements of risk (such as default).

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FIGURE 2-3 Rates of Return and Standard Deviations, 1926 to 2014



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Some Terms

- **Opportunity Cost** — Rate of return on next best investment alternative to the investor
- **Standard Deviation** — Dispersion or variability around the mean rate of return in the financial markets
- **Real Return** — Return earned above the rate of inflation
- **Maturity-risk Premium** — Additional return required by investors in long-term securities to compensate for greater risk of price fluctuations on those securities caused by interest rate changes
- **Liquidity-risk Premium** — Additional return required by investors in securities that cannot be quickly converted into cash at a reasonably predictable price

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Interest Rate Levels

- Interest rate levels and inflation are displayed in Table 2-2 and Figure 2-4. We observe:
  - A direct relationship between inflation and interest rates.
  - The returns are affected by the degree of inflation, default premium, maturity premium, and liquidity premium.

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TABLE 2-2 Interest Rate Levels and Inflation Rates, 1990 through 2014

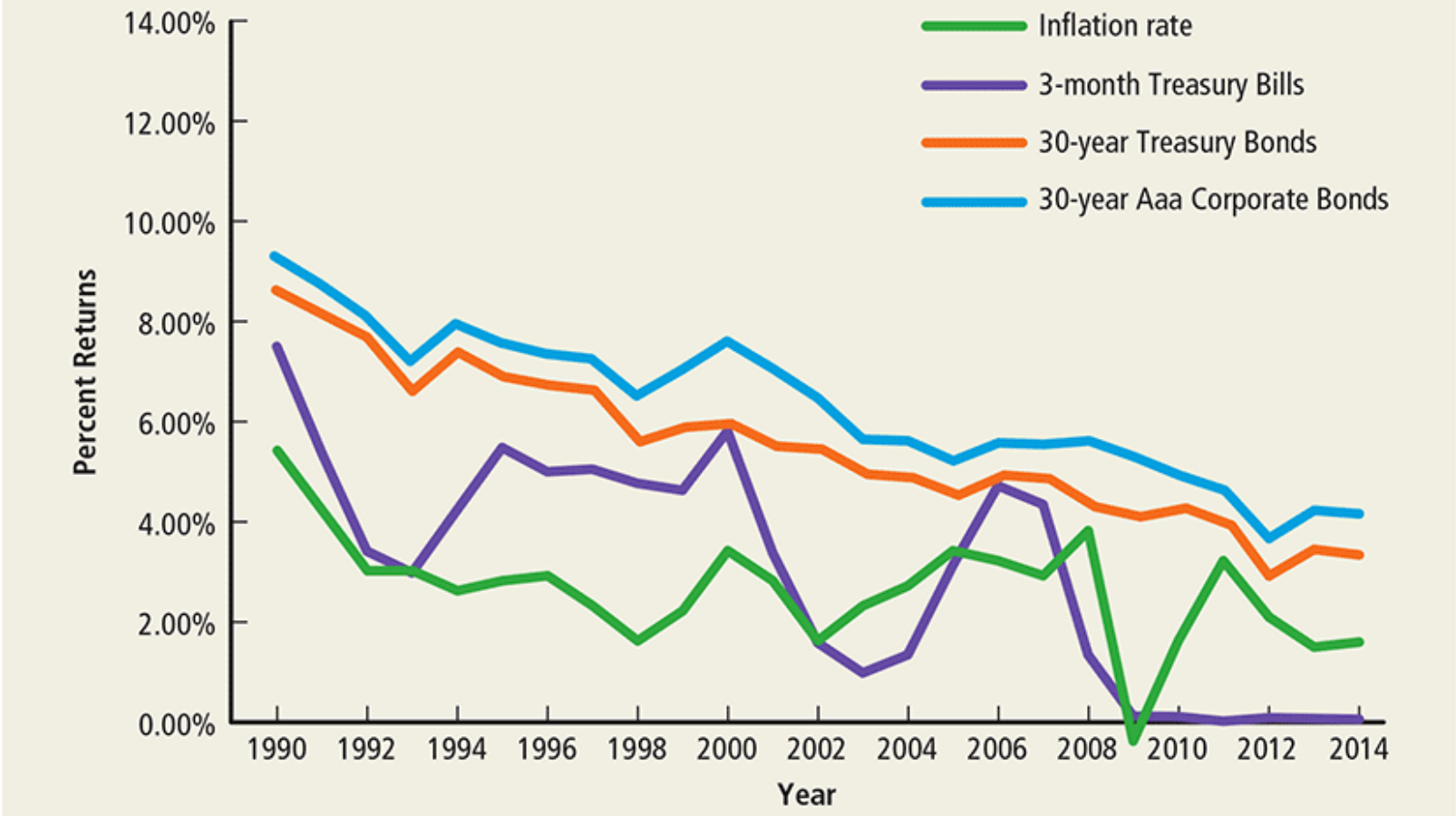
Year	3-month Treasury Bills %	30-yr Treasury Bonds %	30-yr Aaa Corporate Bonds %	Inflation Rate %
1990	7.5	8.61	9.32	5.4
1991	5.38	8.14	8.77	4.2
1992	3.43	7.67	8.14	3
1993	3	6.59	7.22	3
1994	4.25	7.37	7.97	2.6
1995	5.49	6.88	7.59	2.8
1996	5.01	6.71	7.37	2.9
1997	5.06	6.61	7.27	2.3
1998	4.78	5.58	6.53	1.6
1999	4.64	5.87	7.05	2.2
2000	5.82	5.94	7.62	3.4
2001	3.4	5.49	7.08	2.8
2002	1.61	5.43	6.49	1.6
2003	1.01	4.93	5.66	2.3
2004	1.37	4.86	5.63	2.7
2005	3.15	4.51	5.23	3.4
2006	4.73	4.91	5.59	3.2
2007	4.36	4.84	5.56	2.9
2008	1.37	4.28	5.63	3.8
2009	0.15	4.08	5.31	–0.4
2010	0.14	4.25	4.94	1.6
2011	0.05	3.91	4.64	3.2
2012	0.09	2.92	3.67	2.1
2013	0.06	3.45	4.23	1.5
2014	0.03	3.34	4.16	1.6
Mean	3.04	5.49	6.35	2.64

Source: Federal Reserve System, Release H-15, Selected Interest Rates. Office of Inspector General c/o Board of Governors of the Federal Reserve System.

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FIGURE 2-4 Interest Rate Levels and Inflation Rates, 1990 through 2014



Source: Federal Reserve System, Release H-15, Selected Interest Rates. Office of Inspector General c/o Board of Governors of the Federal Reserve System.

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Observations From Table 2-2 and Figure 2-4

- Between 1990 and 2014:
  - Average inflation premium = 2.64%
  - Average default risk premium = 0.86%
  - Average maturity risk premium = 2.45%

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INTEREST RATE DETERMINANTS

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Interest Rate Determinants

- **Nominal interest rate** = Real risk-free rate
  + Inflation premium
  + Default-risk premium
  + Maturity-risk Premium
  + Liquidity-risk Premium
- Thus the nominal rate or quoted rate for securities is driven by all of the above risk premium factors. Such knowledge is critical when companies set an interest rate for their issues. Review the example in text.

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Real and Nominal Rates

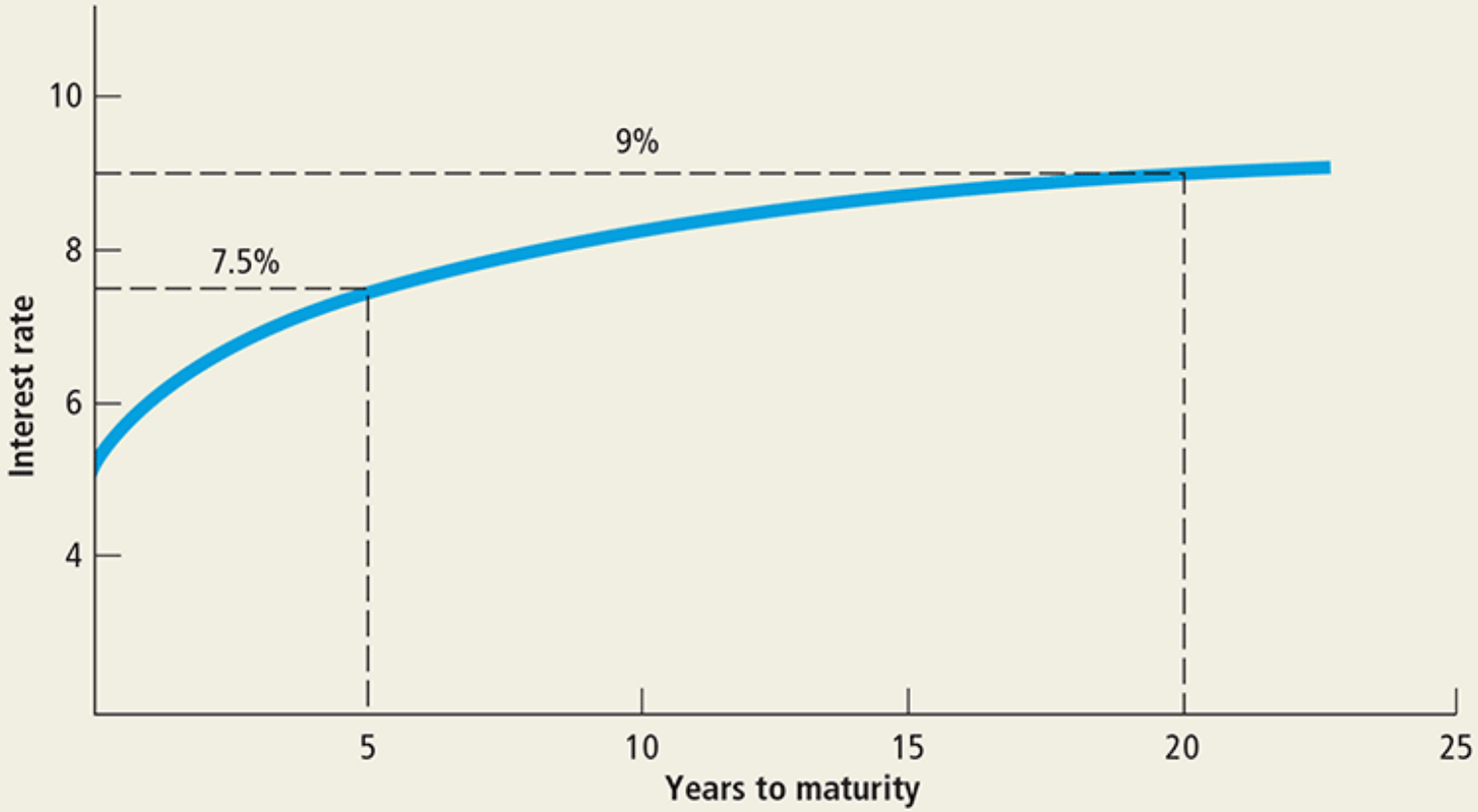
- Real risk-free interest rate = risk-free rate
  – inflation premium
- Nominal interest rate ≈ (approximately equals)
  real rate of interest
  + inflation risk premium

- **The real rate of interest** is the nominal (quoted) rate of interest less any loss in purchasing power of the dollar during the time of the investment.

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FIGURE 2-5 The Term Structure of Interest Rates



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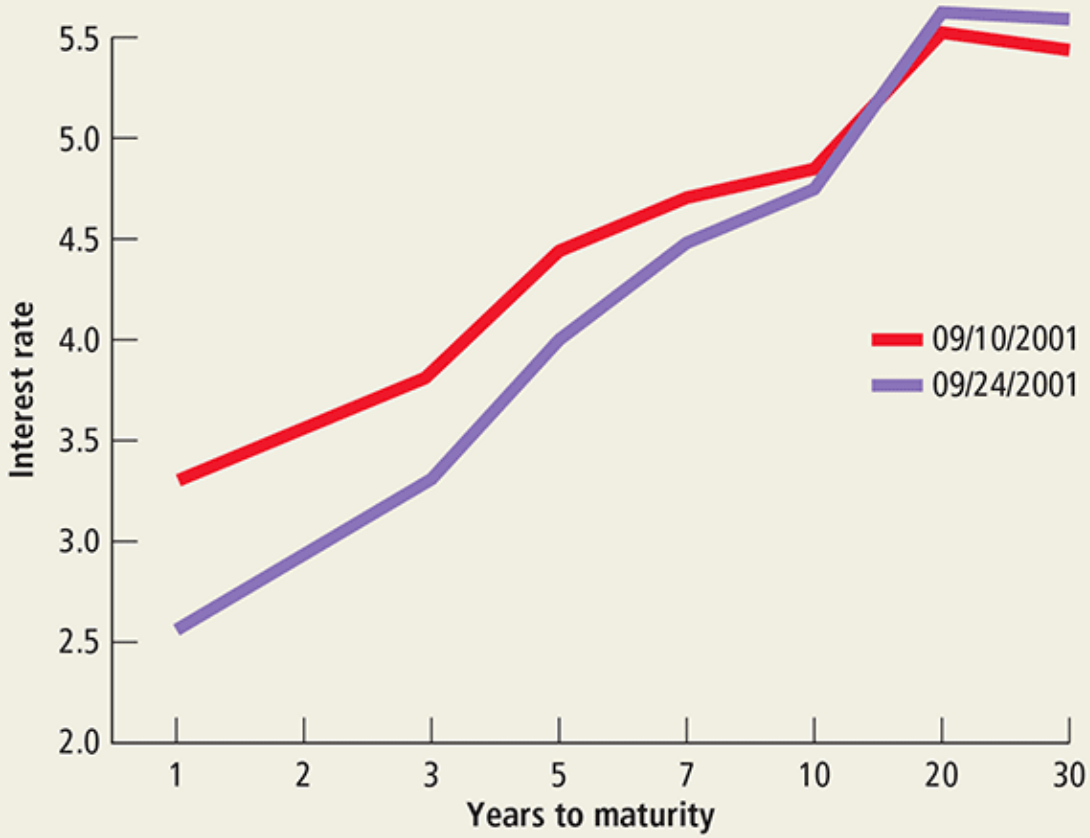
The Term Structure of Interest Rates

- Figure 2-5 shows the relationship between a debt security's rate of return and the length of time until the debt matures, where the risk of default is held constant.
- The graph could be upward-sloping (indicating longer-term securities command higher returns), flat (equal returns for long- and short-term securities), or inverted (longer-term securities command lower returns compared to short-term securities).
- The graph changes over time. Upward-sloping curve is most commonly observed.

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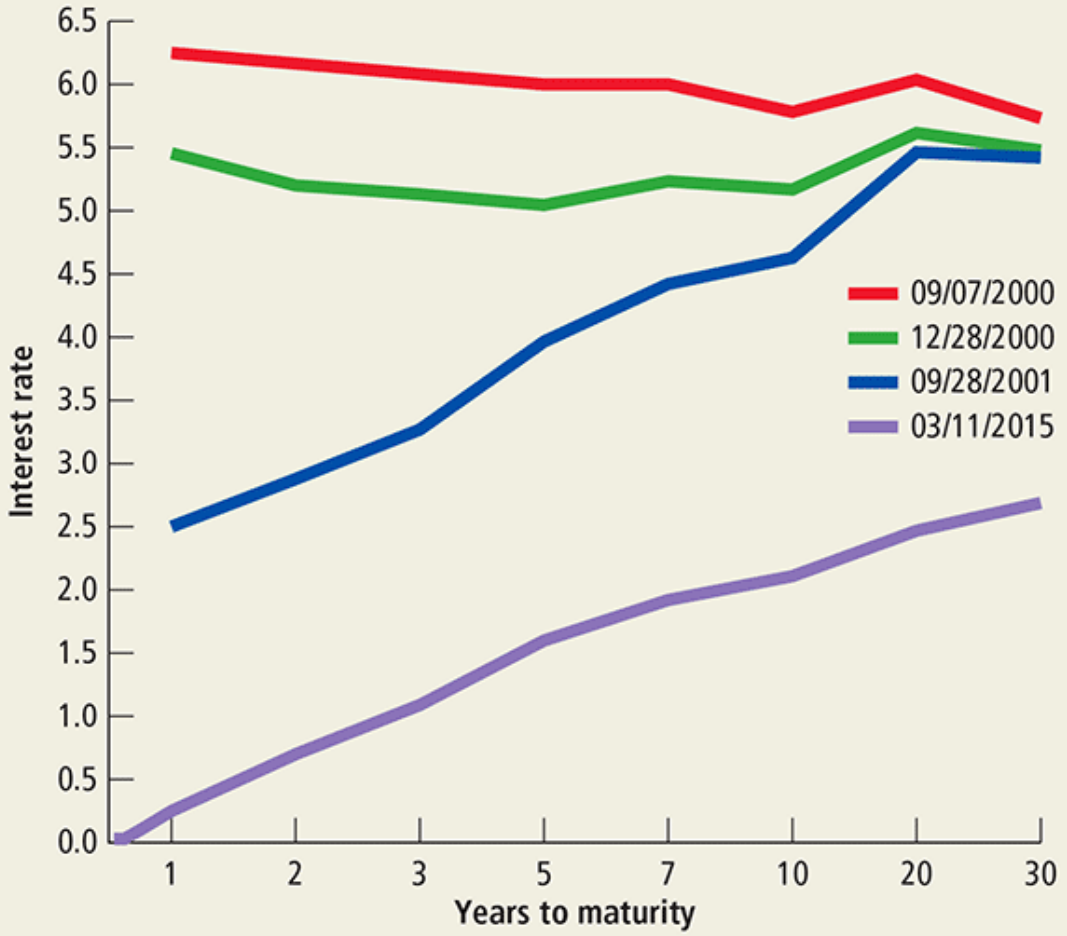
FIGURE 2-6 Changes in the Term Structure of Interest Rates Around September 11, 2001



Source: Federal Reserve System, Release H-15. Office of Inspector General c/o Board of Governors of the Federal Reserve System.

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FIGURE 2-7 Historical Term Structures of Interest Rates for Government Securities



Source: Federal Reserve System, Release H-15. Office of Inspector General c/o Board of Governors of the Federal Reserve System.

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What Explains the Shape of the Term Structure?

The Unbiased Expectations Theory

- Term structure is determined by an investor's expectations about future interest rates.

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What Explains the Shape of the Term Structure?

The Liquidity Preference Theory

- Investors require maturity-risk premiums to compensate them for buying securities that expose them to the risks of fluctuating interest rates.

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What Explains the Shape of the Term Structure?

The Market Segmentation Theory

- Legal restrictions and personal preferences limit choices for investors to certain ranges of maturities.
- This theory implies that the rate of interest for a particular maturity is determined by demand and supply for a given maturity.

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Key Terms

- Angel investor
- Basis point
- Capital markets
- Default-risk premium
- Direct sale
- Dutch auction
- Flotation costs
- Futures market
- Initial public offering (IPO)
- Inflation premium
- Investment banker
- Liquidity preference theory
- Liquidity-risk premium
- Market segmentation theory
- Maturity-risk premium
- Money market
- Nominal (or quoted) rate of interest

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Key Terms

- Opportunity cost of funds
- Organized security exchanges
- Over-the-counter markets
- Primary market
- Private placement
- Privileged subscription
- Public offering
- Real rate of interest
- Real risk-free interest rate
- Seasoned equity offering (SEO)
- Secondary market
- Spot market
- Syndicate
- Term structure of interest rates
- Unbiased expectations theory
- Underwriting
- Underwriter's spread
- Venture capitalist
- Yield to maturity

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