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 security market regulation is reviewed. Further discussions cover rates of return over long periods and 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. 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** takes place in the public market.
   b. The security-issuing firm does not meet (face-to-face) the actual investors in the securities.
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 startup 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 state in the startup firm.

B. Primary Markets Versus Secondary Markets

1. Securities are first offered for sale in a **primary market**. For example, the sale of a new bond issue, preferred stock issue, 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.

C. 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, which 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.

D. Spot Markets Versus Futures Markets

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

2. **Futures markets** are 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're buying, how much of it you're buying, at what price you're buying it, and when you will actually make the purchase.

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

1. Because of the technological advances over the past 10 years coupled with deregulation and increased competition, the difference between an organized exchange and the over-the-counter market has been blurred. **Organized security exchanges** are tangible entities whose 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:

a. Providing a continuous market. A continuous market provides a series of continuous security prices.

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. Three basic functions are provided by the investment banker:

1. He or she 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 (hopefully) at a higher price than it paid.

2. He or she provides for the **distribution** of the securities to the investing public.

3. He or she **advises** firms on the details of selling securities.

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.

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 the bids are in, they 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 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 percent 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, too, are usually expressed as a percent of the issue's gross proceeds.

2. SEC data reveal two relationships about flotation costs.

   a. Issue costs (as a percent 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 (like 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

While interest rates are presently at historically low levels and stock prices have been extremely volatile since 2007, over the longer run:

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 3.7 percent more than the rate earned on long-term corporate bonds.

B. Interest Rate Levels in Recent Periods

1. **Maturity-risk premium** is another factor that affects interest rate levels ad arises even if security posses equal odds of default.

2. The **liquidity-risk premium** needs to be identified and defined to help determine interest rate levels.

IV. Interest Rate Determinants in a Nutshell

The real risk-free interest rate a required rate of return on a fixed-income security that has no risk in an economic environment of zero inflation.

A. Estimating Specific Interest Rates Using Risk Premiums

B. Real Risk-Free Interest Rates and the Risk-Free Interest Rate

1. Putting the term "real" in front of an interest rate means the rate has been adjusted for inflation.

C. 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. The nominal rate of interest can be viewed as,

nominal interest rate = real risk-free interest rate
+ inflation premium
+ default-risk premium
+ maturity-risk premium
+ liquidity-risk premium

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

1 + nominal rate of interest = (1 + real rate of interest)(1 + anticipated rate of inflation)

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% and the expected inflation rate is 4%, the nominal rate would then be 9.2%, computed as follows:

nominal rate of interest = .05 + .04 + (.05)(.04)
= .092 or 9.2%

E. The 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 to maturity**.

F. Observing the Historical Term Structures 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 1 month ago and different still from the term structure 1 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.

G. What Explains the Shape of the Term Structure?

1. The **unbiased expectations theory** says that the term structure is determined by an investor's expectations about future interest rates.
2. The **liquidity preference theory** suggests that investors require liquidity premiums (additional returns) to compensate them for buying securities that expose them to a greater risk of fluctuating interest rates.
3. The **market segmentation theory** is built on the notion that legal restrictions and personal preferences limit investment choices to certain ranges of maturities and therefore affect the rates of return required in each range.

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 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). Trades in the capital market can take place on organized exchanges or over-the-counter.

2-2. Organized stock exchanges provide for:

(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. The criteria for listing can be labeled as follows: (1) profitability; (2) size; (3) market value; (4) public ownership.

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; (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 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 banker who originates the business probably cannot afford to purchase the entire new issue himself; (2) to spread the risk of loss among several underwriters; (3) to widen the distribution network.

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 a period of time. Also, elements of the debt contract can be renegotiated during the life of the loan.

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

2-10. First, there may be a direct transfer of savings from the investor to the borrower. Second, there may be an indirect transfer that uses the services provided by an investment banker. Third, there may be an indirect transfer that uses the services of a financial intermediary. Private pension funds and life insurance companies are prominent examples of the latter case.

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. Also, since there will be other entities in need of funds, including both businesses and governments, the firm must offer the investor a return that is attractive, given the investor's next best opportunity. Thus, the cost of money to the firm will invariably be determined by the investor's next best opportunity for the given level of risk being assumed—that is, the investor's opportunity cost. Otherwise, the investor will not be interested in purchasing the company's bonds or stocks. 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 with securities, with higher levels of risk producing higher returns.

2-13. We may think of the difference in the nominal rate and real rate of return as the "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 to us, all other factors than maturity, such as the chance of the bond defaulting, must be held constant.

2-15. Three theories were given in the chapter 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 investor's expectations about future interest rates. 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 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 securities that expose them to the risks of fluctuating future interest rates.

(3) The market segmentation theory is built on the notion that legal restrictions and personal preferences limit 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 for securities having different maturities.

SOLUTIONS TO END-OF-CHAPTER STUDY PROBLEMS

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

NI = Nominal interest rate
RI = Real- risk free interest rate
IP = Inflation premium
DF = default-risk premium
MP = maturity-risk premium
LP =Liquidity-risk premium

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

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

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

Since 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,

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

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

Thus, DP = 2.4%

2-2. Letting NI = nominal rate

RI = real risk-free rate

IP = inflation rate

DP = Default-risk premium

MP = Maturity premium

LP = Liquidity premium

Since this is a Treasury security, there is not a Default-risk premium (DP) or Liquidity-risk premium (LP), thus,

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

4.5%=2%+2%+MP

Thus, MP = 0.5%

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 Expected Inflation is:
(1 + Inflation) = (1 + Nominal)/(1 + real rate of return)

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

(1 + Inflation) = 1.0189

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) = 11.28%

2-5. If k = nominal rate
k* = real rate
IRP = inflation rate
then, k =k* + IRP + (IRP)(k*)
k = 0.06 + 0.04 + (0.06)(0.04) = 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	Mean Nominal Yield %	Mean Inflation Rate %	Inferred Real Rate %
Treasury bill	4.31	2.78	1.53
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.

2-7. Ignoring the cross-product involves using the simple arithmetic calculation, rather than the geometric one.

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

Entering in our variables, we see that:

Real Rate = 4.5% – 2.1%
Real Rate = 2.4%

2-8. Real risk free rate: 4.8%
Rate of inflation: 3.1%
Expected rate of return: 4.8% + 3.1% = 7.9%

2-9. On this problem we are implicitly assuming the same inflation premium and that there are no tax differences.

20-year Treasury Bonds:

Yield: 5.1%
Liquidity premium: 0.0%

20-year corporate bonds:
Yield: 9.1%
Liquidity 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 + DF + MP + LP, where:
NI = Nominal interest rate
RI = Real- risk free interest rate
IP = Inflation premium
DF = default-risk premium
MP = maturity-risk premium
LP =Liquidity-risk premium

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 year: 2.5% + 0.30% + 2.0% =4 .80%
2–3 year: 2.5% + 0.60% + 2.0% = 5.10%
3–4 year: 2.5% + 0.90% + 2.0% = 5.40%

2-12. We are told that:

Real risk-free interest rate: 3.0%
Inflation: 3.0%
Default risk premium: 1.5%
Liquidity risk premium: 0.02%

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

NI = Nominal interest rate
RI = Real- risk free interest rate
IP = Inflation premium
DF = default-risk premium
MP = maturity-risk premium
LP =Liquidity-risk premium

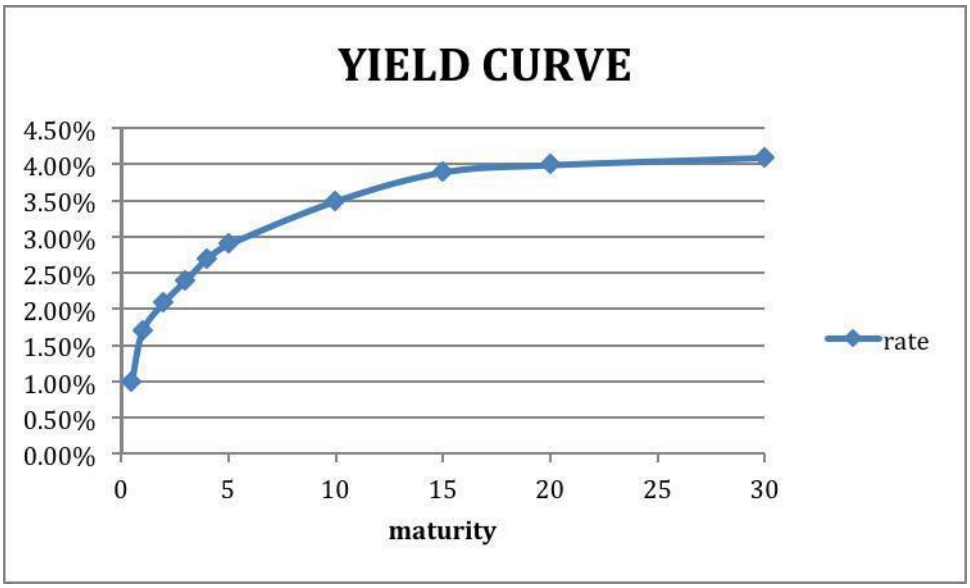
Using these inputs and this formula, we come up with the following nominal rates:

0–1 year: 3.0% + 3.0% + 1.5% + 0.02% + 0.07% = 7.59%
1–2 year: 3.0% + 3.0% + 1.5% + 0.02% + 0.35% = 7.87%
2–3 year: 3.0% + 3.0% + 1.5% + 0.02% + 0.70% = 8.22%
3–4 year: 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. Investing in the one-year security, you would 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 bought 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 foregoing logic is based on the expectations theory of term structure of interest rates.

b. If you require an 11 percent rate on the second one-year investment, then the expectations theory is not fully explaining the term structure of interest rates. The 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 buys into the idea that investors have a preference toward more liquid investments, and that 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.

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

SOLUTION TO MINI CASE

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