

1. Risky assets, on average, earn a risk premium. There is a reward for bearing risk.
2. The greater the potential reward from a risky investment, the greater is the risk.

These lessons have significant implications for the financial manager. We will be considering these implications in the chapters ahead.

We also discussed the concept of market efficiency. In an efficient market, prices adjust quickly and correctly to new information. Consequently, asset prices in efficient markets are rarely too high or too low. How efficient capital markets (such as the NYSE) are is a matter of debate, but, at a minimum, they are probably much more efficient than most real asset markets.

Chapter Review and Self-Test Problems

- 12.1 Recent Return History** Use Table 12.1 to calculate the average return over the years 1996 through 2000 for large-company stocks, long-term government bonds, and Treasury bills.
- 12.2 More Recent Return History** Calculate the standard deviation for each security type using information from Problem 12.1. Which of the investments was the most volatile over this period?

Answers to Chapter Review and Self-Test Problems

- 12.1** We calculate the averages as follows:

Actual Returns			
Year	Large Company Stocks	Long-Term Government Bonds	Treasury Bills
1996	0.2296	0.0163	0.0512
1997	0.3336	0.1089	0.0522
1998	0.2858	0.1344	0.0506
1999	0.2104	-0.0712	0.0485
2000	-0.0910	0.1753	0.0609
Average	0.1937	0.0727	0.0527

- 12.2** We first need to calculate the deviations from the average returns. Using the averages from Problem 12.1, we get:

Deviations from Average Returns			
Year	Large Company Stocks	Long-Term Government Bonds	Treasury Bills
1996	0.0359	-0.0564	-0.0014
1997	0.1400	0.0362	-0.0005
1998	0.0921	0.0616	-0.0021
1999	0.0167	-0.1439	-0.0042
2000	-0.2847	0.1025	0.0083
Total	0.0000	0.0000	0.0000

We square these deviations and calculate the variances and standard deviations:

Squared Deviations from Average Returns			
Year	Large Company Stocks	Long-Term Government Bonds	Treasury Bills
1996	0.0012906	0.0031861	0.0000021
1997	0.0195872	0.0013073	0.0000002
1998	0.0084837	0.0038000	0.0000044
1999	0.0002801	0.0207076	0.0000177
2000	0.0810670	0.0105157	0.0000682
Variance	0.0276771	0.0098792	0.0000232
Std dev	0.1663645	0.0993941	0.0048134

To calculate the variances, we added up the squared deviations and divided by 4, the number of returns less 1. Notice that the stocks had much more volatility than the bonds with a much larger average return. For large company stocks, this was a particularly good period; the average return was 19.37 percent.

Concepts Review and Critical Thinking Questions

- Investment Selection** Given that OSI Pharmaceuticals was up by over 900 percent for 2000, why didn't all investors hold OSI Pharmaceuticals?
- Investment Selection** Given that Yahoo! was down by almost 90 percent for 2000, why did some investors hold the stock? Why didn't they sell out before the price declined so sharply?
- Risk and Return** We have seen that, over long periods of time, stock investments have tended to substantially outperform bond investments. However, it is not at all uncommon to observe investors with long horizons holding entirely bonds. Are such investors irrational?
- Market Efficiency Implications** Explain why a characteristic of an efficient market is that investments in that market have zero NPVs.
- Efficient Markets Hypothesis** A stock market analyst is able to identify mispriced stocks by comparing the average price for the last 10 days to the average price for the last 60 days. If this is true, what do you know about the market?
- Semistrong Efficiency** If a market is semistrong form efficient, is it also weak form efficient? Explain.
- Efficient Markets Hypothesis** What are the implications of the efficient markets hypothesis for investors who buy and sell stocks in an attempt to "beat the market"?
- Stocks versus Gambling** Critically evaluate the following statement: Playing the stock market is like gambling. Such speculative investing has no social value, other than the pleasure people get from this form of gambling.
- Efficient Markets Hypothesis** There are several celebrated investors and stock pickers frequently mentioned in the financial press who have recorded huge returns on their investments over the past two decades. Is the success of these particular investors an invalidation of the EMH? Explain.

10. **Efficient Markets Hypothesis** For each of the following scenarios, discuss whether profit opportunities exist from trading in the stock of the firm under the conditions that (1) the market is not weak form efficient, (2) the market is weak form but not semistrong form efficient, (3) the market is semistrong form but not strong form efficient, and (4) the market is strong form efficient.
- The stock price has risen steadily each day for the past 30 days.
 - The financial statements for a company were released three days ago, and you believe you've uncovered some anomalies in the company's inventory and cost control reporting techniques that are causing the firm's true liquidity strength to be understated.
 - You observe that the senior management of a company has been buying a lot of the company's stock on the open market over the past week.

Questions and Problems

Basic

(Questions 1–12)

- Calculating Returns** Suppose a stock had an initial price of \$62 per share, paid a dividend of \$1.50 per share during the year, and had an ending share price of \$51. Compute the percentage total return.
- Calculating Yields** In Problem 1, what was the dividend yield? The capital gains yield?
- Return Calculations** Rework Problems 1 and 2 assuming the ending share price is \$81.
- Calculating Returns** Suppose you bought a 10 percent coupon bond one year ago for \$1,080. The bond sells for \$1,100 today.
 - Assuming a \$1,000 face value, what was your total dollar return on this investment over the past year?
 - What was your total nominal rate of return on this investment over the past year?
 - If the inflation rate last year was 4 percent, what was your total real rate of return on this investment?
- Nominal versus Real Returns** What was the average annual return on large-company stock from 1926 through 2000:
 - In nominal terms?
 - In real terms?
- Bond Returns** What is the historical real return on long-term government bonds? On long-term corporate bonds?
- Calculating Returns and Variability** Using the following returns, calculate the average returns, the variances, and the standard deviations for X and Y.

Year	Returns	
	X	Y
1	16%	34%
2	18	-7
3	-9	-12
4	21	41
5	2	10

- 8. Risk Premiums** Refer to Table 12.1 in the text and look at the period from 1970 through 1975.
- Calculate the average returns for large-company stocks and T-bills over this time period.
 - Calculate the standard deviation of the returns for large-company stocks and T-bills over this time period.
 - Calculate the observed risk premium in each year for the large-company stocks versus the T-bills. What was the average risk premium over this period? What was the standard deviation of the risk premium over this period?
 - Is it possible for the risk premium to be negative before an investment is undertaken? Can the risk premium be negative after the fact? Explain.
- 9. Calculating Returns and Variability** You've observed the following returns on Crash-n-Burn Computer's stock over the past five years: -8 percent, 13 percent, 5 percent, 16 percent, and 32 percent.
- What was the average return on Crash-n-Burn's stock over this five-year period?
 - What was the variance of Crash-n-Burn's returns over this period? The standard deviation?
- 10. Calculating Real Returns and Risk Premiums** For Problem 9, suppose the average inflation rate over this period was 3.5 percent and the average T-bill rate over the period was 4.2 percent.
- What was the average real return on Crash-n-Burn's stock?
 - What was the average nominal risk premium on Crash-n-Burn's stock?
- 11. Calculating Real Rates** Given the information in Problem 10, what was the average real risk-free rate over this time period? What was the average real risk premium?
- 12. Effects of Inflation** Look at Table 12.1 and Figure 12.7 in the text. When were T-bill rates at their highest over the period from 1926 through 2000? Why do you think they were so high during this period? What relationship underlies your answer?
- 13. Calculating Investment Returns** You bought one of Great White Shark Repellent Co.'s 9 percent coupon bonds one year ago for \$1,020. These bonds make annual payments and mature six years from now. Suppose you decide to sell your bonds today, when the required return on the bonds is 10 percent. If the inflation rate was 4.2 percent over the past year, what was your total real return on investment?
- 14. Using Return Distributions** Suppose the returns on long-term government bonds are normally distributed. Based on the historical record, what is the approximate probability that your return on these bonds will be less than -3.7 percent in a given year? What range of returns would you expect to see 95 percent of the time? What range would you expect to see 99 percent of the time?
- 15. Using Return Distributions** Assuming that the returns from holding small-company stocks are normally distributed, what is the approximate probability that your money will double in value in a single year? What about triple in value?
- 16. Distributions** In Problem 15, what is the probability that the return is less than -100 percent (think)? What are the implications for the distribution of returns?

Basic*(continued)***Intermediate***(Questions 13–16)*

Challenge

(Questions 17–18)

17. **Using Probability Distributions** Suppose the returns on large-company stocks are normally distributed. Based on the historical record, use the cumulative normal probability table (rounded to the nearest table value) in the appendix of the text to determine the probability that in any given year you will lose money by investing in common stock.
18. **Using Probability Distributions** Suppose the returns on long-term corporate bonds and T-bills are normally distributed. Based on the historical record, use the cumulative normal probability table (rounded to the nearest table value) in the appendix of the text to answer the following questions:
- What is the probability that in any given year, the return on long-term corporate bonds will be greater than 10 percent? Less than 0 percent?
 - What is the probability that in any given year, the return on T-bills will be greater than 10 percent? Less than 0 percent?
 - In 1979, the return on long-term corporate bonds was -4.18 percent. How likely is it that this low of a return will recur at some point in the future? T-bills had a return of 10.32 percent in this same year. How likely is it that this high of a return on T-bills will recur at some point in the future?

S&P Problems**STANDARD
& POOR'S**

- Calculating Yields** Download the historical stock prices for Duke Energy (DUK) under the “Mthly. Adj. Prices” link. Find the closing stock price for the beginning and end of the prior two years. Now use the annual financial statements to find the dividend for each of these years. What was the capital gains yield and dividend yield for Duke Energy stock for each of these years? Now calculate the capital gains yield and dividend for Tommy Hilfiger (TOM). How do the returns for these two companies compare?
- Calculating Average Returns** Download the Monthly Adjusted Prices for Microsoft (MSFT). What is the return on the stock over the past 12 months? Now use the 1 Month Total Return and calculate the average monthly return. Is this one-twelfth of the annual return you calculated? Why or why not? What is the monthly standard deviation of Microsoft’s stock over the past year?

**What's On
the Web?**

- Market Risk Premium** You want to find the current market risk premium. Go to money.cnn.com, follow the “Bonds & Rates” link, and the “Latest Rates” link. What is the shortest maturity interest rate shown? What is the interest rate for this maturity? Using the large-company stock return in Table 12.3, what is the current market risk premium? What assumption are you making when calculating the risk premium?
- Historical Interest Rates** Go the St. Louis Federal Reserve web site at www.stls.frb.org and follow the “FRED®/Data” link and the “Interest Rates” link. You will find a list of links for different historical interest rates. Follow the “10-Year Treasury Constant Maturity Rate” link and you will find the monthly 10-year Treasury note interest rates. Calculate the average annual 10-year Treasury interest rate for 1999 and 2000. Compare this number to the long-term government bond returns and the U.S. Treasury bill returns found in Table 12.1. How does the 10-year Treasury interest rate compare to these numbers? Do you expect this relationship to always hold? Why or why not?

12.3. Market Efficiency What are the best performing stocks over the past year? Go to finance.yahoo.com and select the “Stock Screener” link. You will see a “Performance” category and a pull-down menu labeled “1 Yr Stock Perf.” Select “Up more than 200%” and “Find Stocks.” How many stocks have increased more than 200% over the past year? Now go back and select “Down more than 90%.” How many stocks have dropped more than 90% in value over the past year? What does this say about market efficiency?

Spreadsheet Templates 12–7, 12–8, 12–13

