

simple version of the expected return–beta relationship holds. But if those distributions change unpredictably, or if investors seek to hedge nonmarket sources of risk to their consumption, the simple CAPM will give way to a multifactor version in which the security’s exposure to these nonmarket sources of risk command risk premiums.

9. The consumption-based capital asset pricing model (CCAPM) is a single-factor model in which the market portfolio excess return is replaced by that of a consumption-tracking portfolio. By appealing directly to consumption, the model naturally incorporates consumption-hedging considerations and changing investment opportunities within a single-factor framework.
10. The security market line of the CAPM must be modified to account for labor income and other significant nontraded assets.
11. Liquidity costs and liquidity risk can be incorporated into the CAPM relationship. Investors demand compensation for expected costs of illiquidity as well as the risk surrounding those costs.

Related Web sites for this chapter are available at www.mhhe.com/bkm

homogeneous expectations
market portfolio
mutual fund theorem
market price of risk
beta

expected return–beta
relationship
security market line (SML)
alpha
market model

zero-beta portfolio
liquidity
illiquidity

KEY TERMS

1. What must be the beta of a portfolio with $E(r_p) = 18\%$, if $r_f = 6\%$ and $E(r_M) = 14\%$?
2. The market price of a security is \$50. Its expected rate of return is 14%. The risk-free rate is 6% and the market risk premium is 8.5%. What will be the market price of the security if its correlation coefficient with the market portfolio doubles (and all other variables remain unchanged)? Assume that the stock is expected to pay a constant dividend in perpetuity.
3. Are the following true or false? Explain.
 - a. Stocks with a beta of zero offer an expected rate of return of zero.
 - b. The CAPM implies that investors require a higher return to hold highly volatile securities.
 - c. You can construct a portfolio with beta of .75 by investing .75 of the investment budget in T-bills and the remainder in the market portfolio.
4. Here are data on two companies. The T-bill rate is 4% and the market risk premium is 6%.

Company	\$1 Discount Store	Everything \$5
Forecasted return	12%	11%
Standard deviation of returns	8%	10%
Beta	1.5	1.0

What would be the fair return for each company, according to the capital asset pricing model (CAPM)?

5. Characterize each company in the previous problem as underpriced, overpriced, or properly priced.
6. What is the expected rate of return for a stock that has a beta of 1.0 if the expected return on the market is 15%?
 - a. 15%.
 - b. More than 15%.
 - c. Cannot be determined without the risk-free rate.

PROBLEM SETS

i. Basic





ii. Intermediate

7. Kaskin, Inc., stock has a beta of 1.2 and Quinn, Inc., stock has a beta of .6. Which of the following statements is *most* accurate?
- The expected rate of return will be higher for the stock of Kaskin, Inc., than that of Quinn, Inc.
 - The stock of Kaskin, Inc., has more total risk than Quinn, Inc.
 - The stock of Quinn, Inc., has more systematic risk than that of Kaskin, Inc.
8. You are a consultant to a large manufacturing corporation that is considering a project with the following net after-tax cash flows (in millions of dollars):

Years from Now	After-Tax Cash Flow
0	-40
1-10	15

The project's beta is 1.8. Assuming that $r_f = 8\%$ and $E(r_M) = 16\%$, what is the net present value of the project? What is the highest possible beta estimate for the project before its NPV becomes negative?

9. Consider the following table, which gives a security analyst's expected return on two stocks for two particular market returns:

Market Return	Aggressive Stock	Defensive Stock
5%	-2%	6%
25	38	12

- What are the betas of the two stocks?
- What is the expected rate of return on each stock if the market return is equally likely to be 5% or 25%?
- If the T-bill rate is 6% and the market return is equally likely to be 5% or 25%, draw the SML for this economy.
- Plot the two securities on the SML graph. What are the alphas of each?
- What hurdle rate should be used by the management of the aggressive firm for a project with the risk characteristics of the defensive firm's stock?

For Problems 10 to 16: If the simple CAPM is valid, which of the following situations are possible? Explain. Consider each situation independently.

10.

Portfolio	Expected Return	Beta
A	20	1.4
B	25	1.2

11.

Portfolio	Expected Return	Standard Deviation
A	30	35
B	40	25

12.

Portfolio	Expected Return	Standard Deviation
Risk-free	10	0
Market	18	24
A	16	12

13.

Portfolio	Expected Return	Standard Deviation
Risk-free	10	0
Market	18	24
A	20	22

The following table shows risk and return measures for two portfolios.

Portfolio	Average Annual Rate of Return	Standard Deviation	Beta
R	11%	10%	0.5
S&P 500	14%	12%	1.0

8. When plotting portfolio *R* on the preceding table relative to the SML, portfolio *R* lies:
 - a. On the SML.
 - b. Below the SML.
 - c. Above the SML.
 - d. Insufficient data given.
9. When plotting portfolio *R* relative to the capital market line, portfolio *R* lies:
 - a. On the CML.
 - b. Below the CML.
 - c. Above the CML.
 - d. Insufficient data given.
10. Briefly explain whether investors should expect a higher return from holding portfolio *A* versus portfolio *B* under capital asset pricing theory (CAPM). Assume that both portfolios are fully diversified.

	Portfolio A	Portfolio B
Systematic risk (beta)	1.0	1.0
Specific risk for each individual security	High	Low

11. Joan McKay is a portfolio manager for a bank trust department. McKay meets with two clients, Kevin Murray and Lisa York, to review their investment objectives. Each client expresses an interest in changing his or her individual investment objectives. Both clients currently hold well-diversified portfolios of risky assets.
 - a. Murray wants to increase the expected return of his portfolio. State what action McKay should take to achieve Murray's objective. Justify your response in the context of the CML.
 - b. York wants to reduce the risk exposure of her portfolio but does not want to engage in borrowing or lending activities to do so. State what action McKay should take to achieve York's objective. Justify your response in the context of the SML.
12. Karen Kay, a portfolio manager at Collins Asset Management, is using the capital asset pricing model for making recommendations to her clients. Her research department has developed the information shown in the following exhibit.

Forecast Returns, Standard Deviations, and Betas

	Forecast Return	Standard Deviation	Beta
Stock X	14.0%	36%	0.8
Stock Y	17.0	25	1.5
Market index	14.0	15	1.0
Risk-free rate	5.0		

- a. Calculate expected return and alpha for each stock.
- b. Identify and justify which stock would be more appropriate for an investor who wants to
 - i. add this stock to a well-diversified equity portfolio.
 - ii. hold this stock as a single-stock portfolio.