

Practice Set**CAPM**

1. Suppose the annual rate of return on short-term government securities (risk-free) is 3%. Suppose asset A has a beta of 2 and an expected annual return of 15%.
 - a) What is the expected annual return on the market according to CAPM?
 - b) Draw a diagram showing the security market line, the risk free rate, the expected annual return of the market and the annual return of asset A.
 - c) Calculate the expected annual return on an asset B with a beta of 0.7
 - d) Suppose you bought asset B at £10 and sold it after one year for £12. Calculate the realized annual return on asset B.
 - e) Determine whether asset B is overpriced or underpriced by the market.
 - f) Explain the difference between security market line and capital market line.

2. The T-bill rate is 4% and the expected return on the market is 12%. Using the CAPM:
 - (a) What is the risk premium on the market?

 - (b) What is the expected return on an investment with a beta of 1.5?

 - (c) What is the expected return of an investment with a beta of 0.8?

 - (d) If the market expects a return of 11.2% from stock X, what is its beta?

3. You are a consultant to a large manufacturing corporation that is considering a project with the following net cash flows (in millions of dollars):

Years	Cash Flow
0	-40
1-10	15

The project's beta is 1.8. Assuming that the risk free rate is 8% and the expected market return is 16%, what is the NPV (net present value) of the project?

4. Suppose the rate of return on short-term government securities (risk-free) is 5%. Suppose also that the expected return required by the market for a portfolio with a beta of 1 is 12%. According to the CAPM:
- What is the expected rate of return on the market portfolio?
 - What would be the expected rate of return on a stock with $\beta=0$?
 - Suppose you consider buying a share of stock at \$40. The stock is expected to pay \$3 dividends next year and you expect it to sell then for \$41. What is the return you expect from the stock? The stock risk has been evaluated at $\beta=-0.5$. Is the stock overpriced or underpriced?
5. An investor knows the following information about the mean returns and covariances for three Italian companies: Unicredito Italiano, Telecom Italia and Fiat.

Stock	Correlation with			Expected Return	Historical Return	Variance
	Unicredito Italiano	Telecom Italia	Fiat			
Unicredito Italiano	1	0.14	0.15	17%	16.8%	19.2
Telecom Italia	0.14	1	0.36	12%	-6%	22.8
Fiat	0.15	0.36	1	40%	49%	58.1

Compute the tangency portfolio weights assuming a risk-free asset yield of 5%.