Chapter 8 - Sample Problems

1. What is the expected return for the following stock? (State your answer in percent with one decimal place.)

Outcomes	Possible returns	Probability
better	32%	0.50
same	17%	0.20
worse	-10%	0.30

2. What is the expected return for the following portfolio? (State your answer in percent with two decimal places.)

Stock	Expected returns	Investment
AAA	31.2%	$190,000
BBB	24.0%	$350,000
CCC	18.6%	$200,000
DDD	11.9%	$500,000

3. If the risk-free rate is 4.3%, the expected return on the market is 15.7%, and the expected return on Security J is 21.5%, what is the beta for Security J? (Calculate your answer to two decimal places.)

4. You are considering buying a stock with a beta of 0.73. If the risk-free rate of return is 6.9 percent, and the expected return for the market is 12.2 percent, what should the expected rate of return be for this stock? (State your answer as a percentage.)

5. If the risk-free rate is 6.9%, the market risk premium is 7.0%, and the expected return on Security J is 29.4%, what is the beta for Security J? (Calculate your answer to two decimal places.)

6. You are considering buying a stock with a beta of 2.05. If the risk-free rate of return is 6.9 percent, and the market risk premium is 10.8 percent, what should the expected rate of return be for this stock? (State your answer as a percentage.)

7. You are holding a stock that has a beta of 2.4 and is currently in equilibrium. The required return on the stock is 20.4% and the return on a risk-free asset is 8%. What would be the return on the stock if the stock's beta increased to 3.3 while the risk-free rate and market return remained unchanged? (Calculate your answer to two decimal places and state it as a percentage.)

8. The risk-free return is 4.1% and the market return is 14.0%. What is the expected return for the following portfolio? (State your answer in percent with two decimal places.)

Stock	Beta	Investment
AAA	3.4	$125,000
BBB	2.9	$330,000
CCC	1.3	$230,000
DDD	0.9	$500,000

Solutions to Sample Problems

1.expected return = (32%)(0.50) + (17%)(0.20) + (-10%)(0.30) = 16.4%

2.
First, covert the dollar investments into proportions of total investment by adding the investments in all stocks and then dividing each stock investment by the total.

Stock	Expected returns	Investment
AAA	31.2%	$190,000/1,240,000 = 0.1532
BBB	24.0%	$350,000/1,240,000 = 0.2823
CCC	18.6%	$200,000/1,240,000 = 0.1613
DDD	11.9%	$500,000/1,240,000 = 0.4032
	TOTAL	$1,240,000

Now multiply the expected return for each asset times the proportion of investment allocated to that asset and sum the resulting amounts.
Exp ret = (31.2%)(0.1532) + (24%)(0.2823) + (18.6%)(0.1613) + (11.9%)(0.4032)
Exp ret = 19.35%

3.
k_i = return on asset i
k_{RF} = risk-free rate
k_M = market return
b_i = beta for asset i
$k_M - k_{RF}$ = market risk premium

$k_i = k_{RF} + (k_M - k_{RF})b_i$
$21.5\% = 4.3\% + (15.7\% - 4.3\%)\ b_i$
$17.2\% = (11.4\%)\ b_i$
$b_i = 1.51$

4.
$k_i = k_{RF} + (k_M - k_{RF})b_i$
$k_i = 6.9\% + (12.2\% - 6.9\%)(0.73)$
$k_i = 10.77\%$

5.
$k_i = k_{RF} + (k_M - k_{RF})b_i$
$29.4\% = 6.9\% + (7\%)(\ b_i)$
$(7\%)b_i = 22.5\%$
$b_i = 3.21$

6.
$k_i = k_{RF} + (k_M - k_{RF})b_i$
$k_i = 6.9\% + (10.8\%)(2.05)$
$k_i = 29.04\%$

7.
$k_i = k_{RF} + (k_M - k_{RF})b_i$

Currently,
$20.4\% = 8\% + (k_M - 8\%)(2.4)$
$12.4\% = (2.4)k_M - 19.2\%$
$31.6\% = (2.4)k_M$
$k_M = 13.17\%$

If beta changes to 3.3, but the market return and risk-free rate remain unchanged,
$k_i = 8\% + (13.17\% - 8\%)(3.3)$
$k_i = 25.06\%$

8. First, covert the dollar investments into proportions of total investment by adding the investments in all stocks and then dividing each stock investment by the total.

Stock	Beta	Investment
AAA	3.4	$125,000/1,185,000 = 0.105485
BBB	2.9	$330,000/1,185,000 = 0.278481
CCC	1.3	$230,000/1,185,000 = 0.194093
DDD	0.9	$500,000/1,185,000 = 0.421941
	TOTAL	$1,185,000

Now, multiply the beta for each asset times the proportion of investment allocated to that asset and sum the resulting amounts to get the portfolio beta.
Port beta = (3.4)(0.105485)+(2.9)(0.278481)+(1.3)(0.194093)+(0.9)(0.421941)
Port beta = 1.79831

Now, plug the information into the CAPM formula.
$k_i = k_{RF} + (k_M - k_{RF})b_i$
$k_i = 4.1\% + (14.0\% - 4.1\%)(1.79831) = 21.90\%$